ASK THE EXPERT 2: ENHANCED RECOVERY PROGRAMMES: WHY, HOW AND FOR WHAT?

ESRA7-0473

ENHANCED RECOVERY PROGRAMMES: WHY, HOW AND FOR WHAT?

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Fast-track surgery has increasingly been introduced worldwide, but despite the achieved success, several challenges lie ahead: How many ERAS components are essential? What is the optimal LOS? What are important preoperative risk factors in a fully implemented fast-track program? Modification of undesirable inflammatory responses by high-dose preoperative steroids? Do we need thromboembolic prophylaxis? Optimal procedure-specific pain management? Optimal perioperative blood management? Optimal post-discharge rehabilitation? Nevertheless, fast-track surgery leading to decreased morbidity may have impact on short- and long-term cancer outcomes. Finally, future efforts are required to secure fully implementation of essential ERAS elements.

References


ASK THE EXPERT 4: PAIN MANAGEMENT IN CHILDREN AFTER DAY CASE SURGERY

ESRA7-0486

PAIN MANAGEMENT IN CHILDREN AFTER DAY CASE SURGERY

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The goal of a multimodal analgesia is to obtain a pain control using a synergistic action from different classes of analgesics reducing each drug’s dose and side effects.

Recently opioids are considered not only for their action but also for their important side effects seen more: For instance between 1999 and 2008, the death rates from prescription opioids in the US have quadrupled so analgesic protocols should be considered that include non-opioid analgesics.

Moreover codeine first (2015) and more recently tramadol (2017) received a warning from FDA about their use in children reducing the choice of opioids for perioperative pain control.

The surgically induced stress response can be blocked, reducing the use of opioids and the incidence of their side effects such as nausea, vomiting, respiratory depression, constipation, and the use of other analgesics.

It is important to keep in mind that for the daycase surgery a rapid recovery is required and a good perioperative pain control is needed for an early discharge from hospital.

- NSAIDs and paracetamol are considered the first-line analgesic choice.
- Glucocorticoids (ie dexamethasone) have been shown to reduce nausea and vomiting, one of the common adverse effects from opioids.
- Also the alpha-2 agonists such as clonidine and dexmedethomidine through their receptors located in the substantia gelatinosa can be useful for reducing pain mainly in combination with local anesthetics.
- The use of regional techniques in any case still remains the best option for preventing pain after day case surgery and different techniques can be performed.

ASK-THE-EXPERT 5: POSTOPERATIVE PAIN MANAGEMENT AFTER EAR-NOSE-THROAT SURGERY IN CHILDREN

ESRA7-0477

POSTOPERATIVE PAIN MANAGEMENT AFTER EAR-NOSE-THROAT SURGERY IN CHILDREN

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ENT surgical interventions are common procedures in children and mostly performed on an outpatient basis.

Despite the minor surgery, anesthesia stays, particularly for adenotonsillectomy, challenging. These patients frequently suffer from infections and tonsillar hypertrophy which may lead to chronic airway obstruction, which should be evaluated preoperatively to determine the ease of mask ventilation and intubation.

Postoperatively this procedure causes significant pain for which standard analgesic protocols with paracetamol and NSAID’s are insufficient. Moreover, the use of NSAID’s is controversial due to a possible increased risk of postoperative bleeding.2

The high incidence of PONV and the risk for respiratory depression after adenotonsillectomy prompts many anesthesiologists to avoid opioids.3 Tramadol has proven its effectiveness in post-tonsilllectomy pain although there is some concern about the risk for postoperative respiratory depression.4 Therefore, its use should be limited to a monitored setting. The possible higher risk for PONV after tramadol may be diminished with anti-emetics given pre-emptively and a tramadol bolus given directly post induction.5 A standard bolus of dexamethasone not only decreases PONV but also has a limited analgesic effect.

A possible alternative or supplemental analgesic technique is the infiltration of the tonsillar loge.6 This can be done with local anesthetics but also the use of tramadol or ketamine is described.

At last, pain management shouldn’t be limited to the in-hospital time, because children complain of severe pain up to 7 days after surgery. These patients need a postoperative pain plan with written discharge information because often parents administer fewer doses although their children report significant pain.

References

ASRA-ESRA PANEL: GUIDELINES PEDIATRIC REGIONAL ANAESTHESIA

ESRAT-0255

TOXICITY

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Local Anaesthetic Systemic Toxicity in Children: The reported incidence of local anaesthetic systemic toxicity (LAST) in infants and children is remarkably low. (ADAREP, PRAN others). Reports of vascular puncture does not always equate to LAST. Systemic toxicity requiring intervention is mostly confined to isolated case reports.

Large prospective multicentre audits have reported few cases whilst a positive test dose is largely dependant on the type of block and age of the patient. In the most recent audited cohort from the Pediatric Regional Anaesthesia Network (PRAN) a total of 78,815 blocks were performed with a 0.21% incidence of positive test doses, almost all of which occurred during caudal or epidural placement (Evidence B3). There were no positive test doses in other blocks with the exception of 1 single injection truncal block, although test doses were less frequently utilized in non-neuraxial blocks when ultrasound guidance was used. An advantage of ultrasound is that the local anesthetic agent can be seen to spread outside the vessel.

An unpublished audit of the first 10000 blocks in the PRAN database revealed only 6 reports of cardiac arrest or seizures after bolus administration. A further 12 cases had minor signs of toxicity that were resolved by stopping the infusion (personal communication, Ben Walker) Caution should therefore be taken when a bolus dose is administered especially on top of a background infusion.

Detection of LAST in children, particularly in the more susceptible infants and neonates, is difficult. The majority of children are anaesthetised or sedated prior to placement of neuraxial or peripheral blocks. General anaesthesia not only raises the threshold for LAST but also masks the classic early signs and symptoms of LAST (diaphoresis, somnolence, peri-oral tingling, tinnitus, metallic taste). Under anaesthesia, LAST manifests with ECG changes (ST segment changes, ventricular ectopy, ventricular tachycardia or ventricular fibrillation) and or signs of cardiovascular collapse. Convulsions are difficult to detect under anaesthesia but are more obvious during continuous infusions of local anaesthetic agents.

Prevention. The choice of local anaesthetic agent is important. Ropivacaine and levobupivacaine are preferable to bupivacaine in view of their lower toxic profile. Bupivacaine tends to accumulate after 48 hr of continuous infusions. Regardless of the local anaesthetic agent used strict adherence to dosing guidelines and avoiding conditions that predispose to toxicity (hypoaxemia, hypercapnia and acidosis) is important. Aspiration prior to injection and slow incremental injections (0.1-0.2 mg/kg) and the use of ultrasound are key to reducing the risk of LAST.

Test Dose and Intravascular injection: Because differences exist in both the physiological and clinical conditions under which regional anesthetics are administered in children compared with adults, there is considerable controversy and disparity of practice regarding the use of local anaesthetic test doses in children. The epinephrine-containing test dose was initially described for use in awake adults not receiving β-blocking agents to detect inadvertent intravascular injection during epidural anesthesia. In an awake adult, the injection of a few mL of a local anesthetic (LA) solution containing 15 μg epinephrine produces hemodynamic effects (principally tachycardia) if injected intra-vascularly despite a negative aspiration test for blood. The majority of children, however, have their regional blocks placed while under general anesthesia or while deeply sedated, making the recognition of accidental intravascular injection of local anesthetic with epinephrine more difficult. In order to detect accidental intravascular injection of a LA solution in children, some practitioners add epinephrine to the LA solution at the concentration of 5 or 2.5 μg/g, a concentration of 1/200,000 or 1/400,000, respectively. However because the small child’s increased basal heart rate and because most regional blocks are performed under general anesthesia or sedation, the utility and accuracy of test dosing remains a matter of controversy among pediatric anesthesiologists.

The volume of a pediatric test-dose was empirically defined as a volume of 0.1-0.2 mL/kg of a LA solution containing 5 μg/g of epinephrine, i.e. a dose of 0.5-1 μg/kg epinephrine. This was supposed to be sufficient to induce an easily detectable hemodynamic change but also small enough to avoid complications. EKG changes including elevation of the ST segment or widening of the QRS complex (25% elevation) is considered significant. This dose has been used in most studies performed to date, and is supported by a dose response study.

Possible confounding factors specific to children: One of the main problems is interpreting the hemodynamic response induced by the IV injection of LA mixed with a small dose of epinephrine. The following factors have been demonstrated or theorized to alter the accuracy of a test dose: (i) the general anesthetic agent used and its dose at the time of injection of the test-dose (ii) the higher basal heart rate in infants and small children (iii) a possible age-dependent variation of the reactivity of the cardiovascular system to epinephrine; (iv) the premedication received; (v) the LA used; (vi) the speed of injection is rarely mentioned but is very important.

In all experimental studies using the deliberate IV injection of a LA solution containing epinephrine to model accidental IV injection, no false positive results were observed: any modification of the T wave or of the heart rate within 30 to 90 sec after the injection of a test-dose should thus be interpreted as an accidental IV injection until disproven. In clinical practice, if a test dose is used, there may be false negative results when the test-dose is only partially administered IV or when the general anesthetic agents blunt the hemodynamic effects of epinephrine. A negative result following the injection of a test-dose therefore is reassuring but does not rule out vascular placement of needle or catheter. Any injection of a LA solution should thus be performed slowly, in small aliquots (0.1 to 0.2 ml/kg) and with intermittent aspiration and observation of the ECG tracing.

Practice advisory. Due to the difficulty interpreting a negative test dose, the use of test dosing should remain optional. Slow incremental dosing and close monitoring is recommended.

Management of Local Anesthetic Systemic Toxicity (LAST): In the event of cardiovascular collapse or convulsions as a result of LAST, immediate basic life support should be instituted. The following management algorithm should be followed.

1. Stop administration of local anaesthetic and call for help
2. Immediate hyperventilation with 100% oxygen
3. Suppression of seizures if present (midazolam, thiopentone, propofol)
4. External cardiac massage and
5. Epinephrine 1μg/kg or 1:1000 0.1 ml/kg
6. Administration of 20% Intralipid 1.5 mL/kg intravenously over 1 minute
7. Follow immediately with an infusion at a rate of 0.25 ml/kg/min, Lipid emulsion in propofol should not be used in lieu of intralipid.
8. Repeate bolus every 3-5 minutes up to 3 mL/kg total dose until circulation is restored
9. Continue infusion until hemodynamic stability is restored.
10. Increase the rate to 0.5 mL/kg/min if BP declines
11. A maximum total dose of 10 mL/kg in first 30mins is recommended
12. If no response consider ECMO if available

There are a number of theories as to the mechanism of action of the lipid emulsion works: These include "(i) lipid sink" i.e. a distinct lipid compartment in the blood stream trapping lipophilic local anaesthetic agents (ii) at the mitochondrial level (interrupts fatty acid transport into cardiac mitochondria) and Intralipid supplies new energy (iii) activation calcium channels increasing intracellular calcium.

To date there have been in the order of 10 case reports of intralipid use for LAST in children of which 9 were successful.

References


ESRA-ASRA PANEL: GUIDELINES PAEDIATRIC REGIONAL ANAESTHESIA

ESRA7-0487

LOCAL ANAESTHETICS AND PERIPHERAL BLOCKS

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Central blocks were from the very beginning of pediatric regional anesthesia (PRA) the most commonly used and among them the caudal block was the most popular. More recently the use of the ultrasound technique applied to PRA increased the approaches and techniques of peripheral blocks.

Many papers described the use of local anesthetics and adjuvants for central blocks, dose and concentration well documented; it was different so far for peripheral blocks where most of the papers are review or databases describing the safety and efficacy of peripheral blocks but only few studies compare the “old” bupivacaine to the “new” drugs such as levobupivacaine and ropivacaine or their pharmacokinet-ics. Moreover the different peripheral blocks (from upper to lower extremity blocks, facial plane blocks etc) require different volumes and concentrations.

Once again ESRA and ASRA created a Board in order to have new recommendations describing the suggested doses and concentrations of local anesthetics for the different approaches, using the ultrasound technique, dividing the peripheral blocks in upper and lower extremity blocks, facial plane blocks for a single shot and for a continuous infusion with the respective evidence grade.

Upper and lower extremity blocks (eg axillary, infra and supraclavicular, interscalene,sciatric, femoral): bupivacaine, levobupivacaine or ropivacaine of 0.5-1.5 mg/kg.

Fascial plane blocks (eg transversus abdominis plane,rectus sheath, ilioinguinal iliobrachial blocks) bupivacaine or ropivacaine of 0.25-0.75 mg/kg.

Continuous infusion of local anesthetic for peripheral nerve and fascial plane blocks: 0.2% ropivacaine or bupivacaine using an infusion dose of 0.1-0.3 mg/kg/h.

ESRA7-0491

HANDS ON CLINICAL WORKSHOPS 8: AIRWAY AND GASTRIC US

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The increasing familiarity with the use of US technology by anesthesiologists has led to a growing academic and clinical interest in the use of ultrasoundography for optimal airway management.

Since ultrasound waves cannot penetrate air, images of the airway structures differ from the ones anesthesiologists are familiar with in US guided nerve blocks or even transesophageal echocardiography. Intraluminal air produces comet tail or reverberation artifacts. Bone appears bright and hyperechoic with an acoustic shadow behind. Cartilaginous structures like thyroid, cricoid and trachea are homogeneous and hypoechoic but tend to calcify with age. Muscle and connective tissue are heterogeneously striated and hypoechoic. Fatty and glandular (submandibular, thyroid) tissues are homogeneous and hyperechoic in comparison with adjacent soft tissues.

So, US technology can be used to visualize and examine the airway and its surroundings from the tip of the chin up to the trachea. Results of this examination may assist in several aspects the evaluation of the airway. It has been used in order to determine airway size and estimate appropriate endotracheal tube (ETT) size (assessing the narrowest diameter of the cricoideal lumen), to predict difficult laryngoscopy (visualization of hyoid bone, measurement of pretracheal tissue and hyomental distance), to verify ETT position in situations involving cardiovascular arrest where capnography is not indicative, to facilitate awake intubation using US guided upper airway anaesthesia and identifying cricothyroid membrane before management of a difficult airway.

Additionally, US is used in diagnosing intraoperative pneumothorax and in assessing gastric content and volume, that can help determine aspiration risk.

LUNCHEON SESSION 02: PECTORALIS BLOCKS

ESRA7-0479

PECTORALIS BLOCKS

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The Pecs block is an easy and reliable superficial block described by Blanco (8) that targets the lateral and median pectoral nerves at an interfascial plane between the pectoralis major and minor. It can be used for different breast operations but we mainly use it for breast expanders and subpectoral prosthesis.

Pecs II or Pecs I modified aims to block the lateral branches of the intercos-tal nerves (T2–T6), long thoracic nerve, and intercostobrachial nerves. It has been described for providing analgesia for breast surgeries including lumpectomy, wide excisions, axillary clearances, sentinel node dissection, and several types of mastectomies (9).

A recently published clinical study has shown the effectiveness of combined Pecs I and II blocks in breast surgeries (10).

Major breast surgery involving axilla, it seems necessary to block pectoralis nerves and intercostobrachial nerves separately. The pectoral nerves are major nerves arising from the brachial plexus innervating the pectoral muscles. The lateral pectoral nerve arises most commonly from C5, C6 and C7 and the median pectoral nerve from C8 and T1, not being able to be blocked performing a paravertebral block.

Pecs are peripheral and superficial blocks with no contraindications to be performed if the patient has any coagulopathy. Moreover, they are ideal for pa-tients with spinal or chest deformity or had any previous thoracic surgery.

LUNCHEON SESSION 19: SINGLE NERVE RESCUE BLOCKS

ESRA7-0481

SINGLE NERVE RESCUE BLOCKS

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Peripheral nerve blockade (PNB) is often accomplished using proximal approaches to the brachial plexus when it comes to the upper extremity, and to the lumbar plexus or the proximal femoral, obturator and lateral femoral cutaneous nerves, combined with a sciatic nerve blockade - a sacral plexus branch, when it comes to the lower extremity. However, a single terminal nerve occasionally requires additional supplementation to “rescue” an inadequate block. Rescue blocks are more commonly described and used in the upper extremity.

Brachial plexus blocks have a success rate of 70%-100%. Distal supple-mentation may be needed in up to 22% of patients. For example, in case an axillary block fails to anaesthetize the median nerve, wrist flexion and sensation over lateral three and a half digits on the palmar side may be intact. A supple-mentary block can be performed at the elbow, forearm or wrist, using nerve stimulation or ultrasound guidance (USG). USG is an attractive option because in the given example, the median nerve in the forearm does not have predictable relationship to easily identifiable vascular structures.
In the lower extremity a saphenous nerve block (SNB) anywhere along its course, may be considered a rescue block. The addition of a SNB to the sciatic nerve block in ankle surgery, as a rescue, has a surprising effect - difficult to justify by its cutaneous distribution alone.

Rescue blocks may have drawbacks. For example, pain, considered to guard against intraneural injection, may be absent in a partially anaesthetized limb so, nerve injury may ensue.

**PRO CON DEBATE 1: US GUIDED UPPER AIRWAY BLOCK IS THE BLOCK OF CHOICE FOR AWAKE INTUBATION**

**ESRA7-0488**

**PRO CON DEBATE 1: US GUIDED UPPER AIRWAY BLOCK IS THE BLOCK OF CHOICE FOR AWAKE INTUBATION**

**PRO**

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Upper airway anesthesia is pivotal for successful awake intubation provided either topically or by regional blocks.1 Topical anesthesia may be challenging to impossible in patients with limited mouth opening, inflammatory or other processes, and it also carries the risk of local anesthetic toxicity.2 It is typically short acting, and its penetration is limited, covering only the mucosa, while the deeper tissues still respond to stimulation.4 Airway blocks, on the other hand, are considered technically more difficult to perform and they carry a higher risk of complications. However, in experienced hands, they can be useful as they provide excellent anesthesia and intubating conditions.5 In order to minimize the complications related to the blind invasive approach, ultrasound (US)-assisted interventions have recently been introduced.

Complete upper airway anesthesia requires bilateral glossopharyngeal nerve block, bilateral superior laryngeal nerve block and transglottic laryngeal injection. The glossopharyngeal nerve (GPN) exits from the jugular foramen located postero-medially to the styloid process and the stylohyoid muscle group, from where it descends along the posterior side of the stylopharyngeal muscle and passes anteriorly to branch at the level of the middle constrictor muscle.6 The GPN provides sensory innervation to the pharyngeal mucosa, vallecula, anterior surface of the epiglottis, soft palate, tonsils and the posterior third of the tongue, making it pivotal for the gag reflex.7 The GPN can be blocked using either the invasive intraoral or the external persistoid approach.8 For intraoral approach, the patient must have enough mouth opening ability for visualization of the base of the posterior tonsillar pillar. In addition, adequate topical anesthesia must be provided to that area for easier patient cooperation. This block is performed with 5 mL of local anesthetic using a 22- or 25-gauge spinal needle after the patient’s tongue is displaced in the anteroinferior direction.9 While the intraoral technique is understandably unpopular due to associated long lasting oropharyngeal discomfort, the persistoid GPN block may predictably lead to punctures of jugular vein and internal carotid artery and cause an inadvertent block of the closely adjacent vagus nerve, making the bilateral use of this technique prohibitively risky.10 In order to minimize complications related to the local anesthetic spread to the adjacent vagus, accessory and hypoglossal nerves causing vocal cord paralysis, trapezius muscle and tongue weakness,11 a new, more distal and presumably safer ultrasound-guided GPN block has recently been proposed. Based on cadaver dissections the distal parapharyngeal location of GPN at the level of the middle pharyngeal constrictor and just superficial to the anterolateral pharyngeal wall was confirmed.12 Although the GPN itself was not visualized with US due to its small size, all anatomical structures relevant to a successful and safe GPN block, such as subcutaneous tissues with platysma, submandibular gland, superficial muscle layer, facial arteries (using Doppler) and deep muscle layer were consistently identified in healthy volunteers.13 The submandibular gland appeared uniformly hypechoic while the pharyngeal wall appeared as a hypechoic line due to its air-mucosa interface. Most importantly, the hyoid bone, the pharyngeal wall, and the interposed parapharyngeal plane of predictable and consistent GPN location were identified sonographically without difficulty.14 The suggested needle trajectory is in-plane needle advancement from the entry point just to the lateral side of the probe and the US-guided direction toward the parapharyngeal space, oriented caudally and anteriorly. Alternative US-guided trajectories to reach the hypoechoic pharyngeal wall are also allowed in order to avoid sensitive collateral structures, including visible blood vessels. Doppler use in this very highly vascular area is strongly recommended. Obtaining reliably good images should be relatively easy since the intended target, the plane just superficial to the pharyngeal wall, is found at the depth of approximately 2 cm, and the estimated depth of needle insertion should be about 4 cm with in-plane advancement and approximately 30° needle-to-US beam angle, allowing for good needle visualization along its trajectory.15 A block of the internal branch of the superior laryngeal nerve (SLN) provides anesthesia to the base of the tongue, posterior surface of the epiglottis, aryepiglottic folds and arytenoids, and abolishes the glottis closure reflex.16 Thus far, various techniques have been suggested. The standard ‘blind’ landmark approach uses the close anatomical relation of the SLN to the greater horn of the hyoid bone and the thyrohyoid membrane and requires some degree of neck extension, access to the anterior and lateral neck, and the ability to identify the aforementioned structures.12 Nevertheless, it carries the risk of vessel puncture with hematoma formation or local anesthetic toxicity. The blind SLN block is performed in a supine patient with the hyoid bone firmly displaced towards the side to be blocked. The short needle is then advanced posteromedially to the styloid process and the styloid muscle group, from where it descends below its great horn, 1-2 cm deep into the thyrohyoid membrane, after which 2-4 mL of 1%-2% lidocaine is injected.12 Ultrasound, on the other hand, precludes the SLN identification due to small size, but enables a clear visualization of thyrohyoid membrane at mean depth of 1.69 cm, just below the hyoid bone which is also easily identifiable and can be used as the “anchor” landmark.17 With the probe in transverse plane, an in-plane needle introduction is suggested with the needle advancement from the lateral probe’s tip medially into the membrane. In spite of better fit with the skin below the greater horn of the hyoid bone, the parasagittal probe placement is not recommended since the jugular vein and the internal carotid artery consistently drop into the US beam precluding potential subhyoid in-plane needle introduction.15

**CON**

While the intraoral technique is often considered more risky, it can be used as a rescue block in case of failed US-guided block. In the lower extremity a saphenous nerve block (SNB) anywhere along its course, may be considered a rescue block. The addition of a SNB to the sciatic nerve block in ankle surgery, as a rescue, has a surprising effect - difficult to justify by its cutaneous distribution alone.

Rescue blocks may have drawbacks. For example, pain, considered to guard against intraneural injection, may be absent in a partially anaesthetized limb so, nerve injury may ensue.

**References:**

PRO CON DEBATE 2: REGIONAL ANAESTHESIA HAS SIGNIFICANTLY IMPROVED OUTCOME AFTER MAJOR ORTHOPEDIC, ABDOMINAL AND THORACIC SURGERY

ESRA7-0541

CON

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Over the past 30 years, neuraxial blocks, due to improvement of techniques and broadening of indications, have become a widely used method to provide intraoperative anaesthesia and postoperative analgesia. This has been the result of better understanding of neurophysiology as well as advances in technology and training expertise that have made regional anaesthesia appealing to the clinicians. Several techniques are assessed, each having advantages to justify the use of neuraxial techniques as a routine method. In the past, the ability of regional anaesthesia to provide satisfactory management of postoperative pain without a direct translation into improved long-term outcome was considered a sufficient reason to perform a neuraxial block1. Recently though, with the advent of improved general anaesthesia regimens, the availability of multimodal pain therapy, the lessening risk of perioperative morbidity and mortality and the increasing number of patients in fast-track discharge programs, regional anaesthesia is being reappraised and its superiority has receded to levels that may be statistically but not clinically significant2.

In the beginning of the new millennium, there was a great deal of enthusiasm regarding performing thoracic epidurals. The technique was highly recommended as the gold standard approach for major abdominal surgery due to the perceived advantages of dynamic pain relief, maintenance of bowel function, reduction in the incidence of ileus as compared to intravenous analgesia and early mobilisation3. However, a recent meta-analysis of randomized controlled trials comparing epidurals with an alternative analgesic technique following abdominal surgery with epidurals superior in terms of pain scores but demonstrated no advantages for the use of epidurals over other analgesic regimens in terms of overall complications rates, rate of ileus and lengths of hospital stay3. Similarly, in last year’s Cochrane Systematic Review, enthusiasm about thoracic epidurals seems to have faded since it was claimed that the quality of evidence about epidurals in reducing the incidence of vomiting or anastomotic leak and reducing the length of hospital stay is low and very low respectively3. In a retrospective cohort study of nearly 100,000 elective open colectomies performed in the United States, combined general and neuraxial anaesthesia as compared to just general anaesthesia was associated with increased risk for acute myocardial infarction, urinary tract infection, admission to Intensive Care Unit and overall higher expense with no improvement in length of stay4.

The effect of neuraxial blocks on other outcomes, such as cardiovascular and respiratory morbidity has also come under scrutiny in recent years. Older meta-analyses concluded that central blocks significantly reduced serious complications and postoperative mortality; however, most of the studies included in those meta-analyses are today considered out-of-date and had major methodological flaws. Today it is considered that adding epidural analgesia to general anaesthesia does not reduce postoperative morbidity and mortality in the general surgical population and that its benefits are limited to a subpopulation of high-risk patients and procedures3. It is unlikely that such evidence will appear in the next years because the overall incidence of complications diminishes over time4. Also, the beneficial effects of epidural analgesia on deep venous thrombosis have been diminished by routine thromboprophylaxis. Additionally, the current trend of modern surgery is towards less invasive procedures, which are associated with fewer complications, further diminishing the potential benefits of epidural analgesia3. In another recent Cochrane Review comparing epidural analgesia to opioid-based systemic analgesia for abdominal aortic surgery, the level of evidence regarding reduction of time to tracheal extubation and postoperative respiratory complications when epidural was used was low, whereas no difference in 30-day mortality was demonstrated5. A metaanalysis using combined data from several randomized controlled trials of cardiac surgery showed that thoracic epidurals did not show a benefit in reducing mortality or the risk of myocardial infarction perioperatively6. Also, no difference in perioperative morbidity or mortality was demonstrated in an analysis of a multicentre registry investigating the role of the type of anaesthesia on the outcome in endovascular aneurysm repair7. Interestingly, although postoperative delirium is usually presumed to be less frequent after regional anaesthesia as compared to general anaesthesia, in a metaanalysis where the primary outcome of interest was the incidence of postoperative delirium in older adults, there was no significant difference in the incidence of delirium between regional and general anaesthesia8. In addition, the incidence of postoperative cognitive dysfunction was higher in the spiral versus the general anaesthesia group of patients submitted to extracorporeal lithotomy9. Moreover, no significant differences were demonstrated in outcome between regional anaesthesia and non-regional anaesthesia groups in a systematic review assessing functional outcomes 3, 6 and 12 months after knee, shoulder or hip replacement surgery10. In an analysis of the UK hip fracture national database, there was no difference in mortality up to 30 days after surgery associated with regional as compared to general anaesthesia11.

Furthermore, when selecting a technique of central neuraxial block, the risk/benefit ratio should be taken into account, since the risk of serious complications, especially in the presence of anticoagulant therapy or local anaesthetic systemic toxicity, although small, is not totally negligible12-14. In addition, factors such as technical block failures, inadvertent motor blockade, postdural puncture headache, infection as well as the need for ongoing monitoring should be taken into consideration15.

In conclusion, it appears that the use of central neuraxial techniques can provide the most effective postoperative analgesia but this initial functional gain does not always translate into improved long-term outcomes, since the evidence for reduced incidence of major complications when regional anaesthesia is compared to general anaesthesia is mixed16,17. Moreover, the superiority of neuraxial techniques is offset by high failure rates and the availability of alternatives, whereas there are circumstances where the risk of complications or regional anaesthesia exceeds that of general anaesthesia. After an individualized assessment of the risk/benefit ratio, central neuraxial blocks still play a role in perioperative medicine but they should no longer be considered the standard of care for the general surgical population since a clear and consistent benefit of regional anaesthesia on long-term outcome remains elusive.

References

PRO CON DEBATE 3: REMIFENTANIL LABOUR ANALGESIA SHOULD BE OFFERED AS A ROUTINE OPTION TO PREGNANT WOMEN IN LABOUR

ESRA7-0543

PRO

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Need for an alternative to neuraxial analgesia: Neuraxial analgesia represents the gold standard for labour analgesia. Unfortunately, despite the many advantages of this technique, it may be contraindicated, impossible to perform, not available, not needed or not desired by the woman itself. (1,2).

Alternatives to neuraxial analgesia: Until now, there has not been a real safe and effective alternative to neuraxial analgesia. Nitrous oxide, even if widely used in UK, is not very popular elsewhere around the world. Despite its use lasting since one century, no more than 11 RCT have addressed the question of its efficacy without any clear and objective evidence for its use (3)

Many labouring women are also receiving parenteral opioid-based analgesia with meperidine, fentanyl, sufentanil, alfentanil, tramadol, butorphanol, nalbuphine or morphine(4). However, these drugs are of limited efficacy and not devoid of maternal, fetal or neonatal unwanted side effects. As an example, 95% of labour and delivery units in UK were still using intramuscular meperidine in 2007 (5) despite the fact that this drug is known to have long half-life, active metabolites and is associated with CTG alterations and fetal acidosis (6).

Characteristics of the ideal opioid for parenteral labour analgesia: The agent of choice for labour analgesia should have pharmacokinetic properties matching the characteristics of labour pain. This ideal agent should have a rapid onset time, a short duration of action and a rapid elimination independent of its duration of administration. It should have a sufficient efficacy with no or minimal fetal, neonatal and maternal side effects.

Rationale for the use of remifentanil for patient-controlled intravenous labour analgesia: Remifentanil is an ultra short acting m1-receptor agonist with rapid onset and offset of action. The effect site concentration peaks 1.2 min (7) making this drug attractive for IV PCA labour analgesia. In volunteers, the analgesic and ventilatory effects begin at 30 sec and peak at 2.5 min (8). Therefore, a bolus dose of remifentanil administered at the beginning of a contraction (lasting on average 70 sec) is likely to provide analgesia for the next contraction (9-10). Remifentanil has a short context sensitive half-life of 3.5 minutes regardless the duration of infusion. It is rapidly broken down to inactive metabolites by non-specific plasma esterases independent of organ metabolism (11).

Its volume of distribution and clearance in pregnant women are increased leading to a 50% reduction of its plasmatic concentration as compared to non-pregnant women. Remifentanil crosses easily the placental barrier (UV/MA = 0.88) but is also rapidly redistributed and metabolized in the fetus (UA/UV = 0.29) (12)

Analgesic efficacy: Based on a review published in 2016, 36 studies evaluating a total of 1741 patients have evaluated the analgesic efficacy of remifentanil for labour analgesia (4). Based on published results remifentanil is able to reduce pain score from severe (8 out of 10) to moderate (4 out of 10)

The conclusions of this review are the following:

Remifentanil is able to provide “modest” analgesia (Class IIb, level of evidence B).

Remifentanil provides better analgesia than nitrous oxyde (Class IIa, level of evidence B).

Remifentanil provides better analgesia than pethidine (Class I, level of evidence A).

Neuraxial analgesia provides better analgesia than remifentanil (Class I, level of evidence A).

However, despite a significant less effective quality of analgesia, patients receiving remifentanil did not differ in general satisfaction with labor and delivery as compared to those receiving labour epidural analgesia (13)

Optimal regimen for remifentanil administration: Numerous protocols for remifentanil PCA during labour have been described with a large variability in bolus size (0.1 to 1 mg/Kg) and with (0.025 to 0.15 mg/Kg/min) or without background infusion. Some experts have proposed an initial regimen with a fixed 20-50 mg bolus administered on patient request with a lock-out interval of 1-3 min and without background infusion. The bolus size and lock-out interval may be adjusted according to the increase in pain intensity with progress of labour. If a background infusion is added, it should be limited to 0.025 to 0.05 15 mg/Kg/min, as it may compromise the safety of remifentanil PCA (4)

Closed loop protocols taking into account patients request and vital signs might be a promising alternative (14).

Fetal and Neonatal safety: Even if remifentanil is able to alter FHR variability and create some confusion in monitoring during labour (15), it is not associated with significant difference in UA pH as compared to neuraxial analgesia (16). There are fewer non-reassuring CTG traces and better neonatal neurobehavioural scores with remifentanil than with pethidine and remifentanil is associated with a lower need for neonatal resuscitation as compared to fentanyl (17,18)

We can then consider that remifentanil has less effects on the fetus and the neonate than other parenteral opioids (Class IIb, level of evidence B) (4)

Maternal safety and monitoring: Similarly as with other opioids, side effects associated with the use of remifentanil are nausea, vomiting, pruritus, sedation and respiratory depression potentially associated with bradypnea, apnea and oxygen desaturation.

For these reasons, one to one midwifery care is recommended by all experts. A continuous SpO2 and respiratory rate is mandatory and the use of capnography suggested. The majority of the experts who oppose to the routine use of remifentanil do so out of concerns related to maternal safety. Several case reports have even described cardiopulmonary arrest attributable to respiratory depression (19,20).

The incidence of hypoxemia is difficult to define because of the large variations in the literature concerning the trigger to administer supplemental oxygen (systematic or for SpO2 < 95%). The incidence of apnea > 20 sec has been reported to be as high as 26% (13). It has also to be considered that some of these side effects might be related to inappropriate bolus size, lock-out interval or the previous administration of other opioids. On the other hand, some registers such as the Swiss RemiPCA Safe Network report the use of remifentanil in more than 6000 patients without any serious side-effects (21)

Other benefits: As compared to neuraxial analgesia, the use of remifentanil might be associated with a lower incidence of maternal fever, a reduction in the use of oxytocine for augmentation of labour and in the duration of labour (13,22).

Conclusions: Remifentanil patient-controlled analgesia has improved the quality of parental analgesia. The efficacy of remifentanil is superior to other opioids and less fetal and neonatal side-effects are associated with its use.

One to one midwifery care is essential and laboring women receiving remifentanil require an adequate monitoring to detect and alert for apneas.

In these conditions, remifentanil is a valuable option for selected low risk patients who do not need or wish an epidural or for whom neuraxial analgesia is not available, impossible to perform or contraindicated.

References


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**PRO CON DEBATE 5: INTRATHECAL DRUG DELIVERY IS THE WAY FORWARD**

**ESRA7-0569**

**CON**

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While intrathecal drug delivery (IDD) is a useful and widely accepted modality for the treatment of pain in cancer patients it presents to this date several challenges. Safety issues concerning medications as well as the implantation, maintenance and explantation of the devices make its use less desirable, especially for the treatment of non-cancer pain. A recent analysis of closed claims regarding IDD provided evidence for the potential deleterious events associated with the use of IDD (Fitgibbon DR, et al). Specifically, those events were more frequent and associated with the IDDS maintenance, programming errors of the pump, and unrecognized granuloma formation. Complications related to the medication administration were of significance as they lead to death or severe brain damage as well as permanent cord injury along with other temporary minor injuries. Unrecognized granuloma formation in the tip of the catheter during maintenance of IDDS resulted in paraplegia. Other potential complications with the use of the IDDS are the ones that are related to the procedure of the placement of the device. These include infections, retained foreign bodies, injuries of the spinal cord, cerebrospinal fluid leak, cauda equina, etc.

IDDS opioid administration adverse events are potentially catastrophic. Pocket fills result in dispersing a large amount of the drug to subcutaneous tissue and then lead to its systemic absorption. The flushing of the catheter with an opioid instead of saline and the accidental side port injections to refill the hazardous. Granuloma formation from high dose morphine and hydromorphone infusions is also a problem. Unrecognized granuloma formation is deletitious. The patients may be asymptomatic for years before the appearance of a permanent neurological injury.

Due to the very serious complications that are limiting the use of the IDDS, the Polyanalgesic Consensus Conference (PACC) provided a statement published in Neuromodulation in the beginning of the year with recommendations including addressing safety and risks of their use. (Deer T, et al). As the use of targeted drug delivery has demonstrated benefits for the treatment of chronic pain, intrathecal drug delivery will definitely be relevant in the future but most likely will be conducted in a different way. Research in pharmaceuticals and technology is required to improve the pharmacokinetic and pharmacodynamic profile of the of the currently used medications. More importantly though the development of novel compounds that will be administered intrathecally via the appropriate vehicle as well as genetic engineering, may be approaches that will be safer and more efficacious in the treatment of chronic pain in the future.

**References**


**PRO CON DEBATE 6: PERIPHERAL BLOCKS ARE CONTRAINDEICATED WHEN THERE IS A HIGH RISK OF COMPARTMENT SYNDROME**

**ESRA7-0489**

**CON**

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Acute compartment syndrome (ACS) is a potentially disastrous complication following a trauma. The increased pressure in the myofascial compartment are due to muscle swelling, accumulation of blood and can lead to progressive tissue ischemia or even necrosis.

Pain and swelling are the universal symptoms in ACS. However they are also the hallmark of surgery and fractures. Pain is far from a consistent parameter and the predictive value is extremely low. Signals like paresthesia or pulselessness occur late when ischemia and damage is already irreversible. The diagnosis is therefore difficult and requires frequent clinical assessment of patients at risk. Knowledge of risk factors, the nature of the injury and use of compartment pressure monitor is advised. Following diagnosis a swift performance of surgical fasciotomy is needed.

Because regional anesthesia may mask symptoms, it has often been accused of delaying diagnosis. The same has also been said about morphine PCA, however simply withholding any pain medication is unacceptable and unethical.

Multiple case reports have been published reporting no delay in diagnosis after regional anesthesia. Regional anesthesia does not consistently hide ischemic pain caused by ACS. In fact breakthrough pain after a successful regional technique could even speed up early detection, especially in centers with specialized acute pain services. Some reviews suggest using “dry catheters” and adjusted volume and concentration of local anesthetics. Regional anesthesia is safe to use, if managed skillfully, adequate follow up is available and awareness and vigilance remains high.
PERIPHERAL BLOCKS ARE CONTRAINDICATED WHEN THERE IS A HIGH RISK OF COMPARTMENT SYNDROME

ESRA7-0545

PRO


Background: Compartment syndrome is defined by increased pressure within a closed compartment with subsequent compromise of the circulation and function of the tissues within that space. It can occur in any closed compartment but the oseo-fascial compartments of the lower leg are the commonest presentation (1). Untreated, consequences can be devastating.

Annually more than 200,000 people are diagnosed with acute compartment syndrome (ACS) in the USA (2). Forty percent of all ACS result from tibial shaft fracture, 23% from soft tissue tibial trauma, and 18% from forearm fractures (3). The incidence of ACS in one audit was 4.3% in patients with tibial shaft fracture, 23% from soft tissue tibial trauma, and 18% from forearm fractures (3).

Acute compartment syndrome is commonest in males, younger than 35 years of age, drug users, following intramedullary tibial nailing (4). These risk factors should raise a high index of suspicion and should result in close observation and serial examinations aimed at an early and definitive management.

Diagnosis is based on clinical signs and symptoms caused by the effects of increased pressure on structures within the compartment and/or metabolic consequences of muscle ischaemia and necrosis, coupled with objective measurement of intracompartmental pressures. The latter is cumbersome, flawed and not widely available. Clinical findings have been classically described as the “6P’s”:

- Pain (out of proportion to injury),
- Parasthesia (‘pins and needles’),
- Pain on passive movement (forced dorsiflexion of ankle or wrist of affected limb),
- Pulpation (tense, hard muscle compartment),
- Pulselessness

The overall sensitivity of clinical assessment is low for a single clinical finding. However, documenting three or more clinical findings may increase the probability of detecting ACS to 93% (5). Reliance on clinical findings as the only diagnostic marker of ACS has resulted in many trauma units avoiding the concurrent use of peripheral nerve blocks (PNB) (6).

Early recognition is paramount. External pressure (casts and circumferential dressings) should be removed, but the definitive treatment of ACS is extensive fasciotomy of the relevant compartment (7). Early fasciotomy (<6 h) compared with late fasciotomy (>12 h) results in a higher rate of acceptable outcome (88% vs 15%), a lower rate of amputation (3.2% vs 14%) and fewer deaths (2% vs 4.3%) (8).

Arguments against the use of PNB in patients at high risk of ACS

1. Parasthesia: is an early sign of ACS and may be attributable to PNB and the effects of local anaesthetics. Thus it is a clear confounder. Decreased 2-point discrimination is the most consistent early finding, and correlation has also been reported with diminished vibrance sensation measured with a tuning fork. Although both pain and parasthesia have a sensitivity and positive predictive value of 11-19%, their specificity and negative predictive value is 97-98% in lower leg injuries (9).

2. Pain: even though ischaemic pain will eventually break through (9) due to a different pathway comprising preganglionic beta fibres, PNB has been incriminated in delaying diagnosis. Undoubtedly reducing/fixing a fracture is the best analgesic. If challenged, anaesthetist have alternative analgesic techniques as proven by scenarios of compartment syndrome not amenable to PNB or patient refusal. Conversely, patients may still be in pain despite our PNB (acknowledging that this may be used both pro and con), not to mention rebound pain on resolution of a single shot PNB.

3. Surgeon refusal/communication: surgeons fear delay in diagnosis based on the existing literature. In addition they invoke difficulty with monitoring multiple compartmental pressures particularly in departments with no set-ups or explicit patient care pathways. In return, the anaesthetist should communicate to the surgeon the placement of a PNB if that is unavoidable and should take an active part in the postoperative monitoring of the patient.

4. There is no evidence FOR the use of PNB in ACS. Current evidence (both for and against) is limited to case reports and opinion pieces. There is a blatant lack of any prospective or randomized clinical trials comparing outcomes in patients at risk of compartment syndrome who receive a PNB and those who do not (10).

5. Medico-legal issues: In most jurisdictions, one is presumed innocent until proven guilty. It appears that in the case of PNB and attributed delays in the diagnosis of ACS, one is presumed guilty until proven innocent (10). The jury is still very much out. Play safe and don’t take the blame!

Diagnosis and timely management of ACS remains challenging. Rather than focusing on whether to perform a PNB or not, our attention might be better directed toward careful monitoring and serial assessment of high-risk patients, good systems and combined care regardless of analgesic technique.

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PRO CON DEBATE 7: CONTINUOUS SPINAL ANAESTHESIA: THE WAY FORWARD IN HIGH RISK PATIENTS

ESRA7-0565

CON

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In this article I would like to present some myths about CSA and look close at published evidence to bring more light into this debate.

CSA is very safe: Cauda equina syndrome (CES) results from toxic damage to the nerve roots. Cases have been reported using 5% hyperbaric lidocaine. All patients have shown insufficient spread of anaesthesia, which became adequate only after excessive doses of LA had been injected. It was postulated that this was a neurotoxic injury caused by pooling of highly concentrated LA around the cauda equina. 5% hyperbaric lidocaine has been successfully used for single shot spinal anaesthesia for more than 40 years prior to introduction of spinal catheters. …

CSA has low incidence of post-dural puncture headache (PDPH): Incidence of PDPH using large bore catheters (20-24 gauge) is similar (~3%) of single shot spinal anaesthesia using 24G Sprotte needle. Other authors have recorded higher incidence of PDPH (9.2%). When CSA was used for obstetric patients, PDPH was 33%. In case series of CSA used for caesarean delivery, incidence of PDPH was 40%. CSA allows clinicians to thread catheter cephalad: Majority of anaesthesiologists aim to place the catheter in a cephalad direction. Actual direction of catheters is unpredictable. Incidence of caudally placed spinal catheters is 7-35%, regardless of patient position. Insufficient spread of a hyperbaric LA can occur if the catheter is positioned caudally and especially when the local anaesthetic is injected slowly. In this case, nerve roots at the end of dural sac are exposed to high concentration of LA not mixed with CSF, which might be neurotoxic.

CSA is associated with better cardiovascular stability: CSA is claimed to have more stable haemodynamic profile compare with single shot spinal anaesthesia. However some authors didn’t observed any major differences in incidence of hypotension and bradycardia.

Most of the authors remove their spinal catheters at the end of surgery. There are only few studies on the use of spinal catheters for postoperative analgesia.

Kits for CSA are reliable: Microcatheters (28-32 gauge) were introduced in 1990. There was a high incidence of failed block (15%) and 3.4% of broken catheters. They have a high internal resistance, making injection a very slow and difficult to handle. The FDA has since banned the use of spinal catheters. They have a high internal resistance, making injection a very slow and difficult to handle.

CSA is known since 1906 and still hasn’t gained much popularity. There is not too much evidence for that.

References


PRO CON DEBATE 8: SEDATION IS TO BE AVOIDED WHEN REGIONAL ANAESTHESIA IS USED

ESRA7-0514

PRO

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The more frequent use of regional anaesthesia techniques has increased the concerns of neurological sequelae. In peripheral nerve blocks (PNB) the contact with the nerve may be closer than with intrathecal and epidural spaces in central nerve blocks (CNB).

Whereas a complete CNB requires only one puncture, PNB may necessitate more punctures and attempts. In addition the block may not always guarantee that the surgical procedure is 100% comfortable for the patient.

Whereas previously there was much objection against performing blocks under deep sedation or general anaesthesia (GA), due to a lack of evidence the choice nowadays has been left open. Paresthesia, bloody taps, systemic toxicity, pneumothorax or number of attempts do not seem to differ that much between GA, sedation or awake conditions to make strong recommendations (1) while or children blocks placed under general anaesthesia are not subject of debate at all.

However, although systemic toxicity is equal regardless of the state of consciousness, sedating the patient with benzodiazepines or Propofol may decrease the threshold for convulsions but mask cardiac toxicity signs. In addition when
Sedation during block performance and/or the whole surgical procedure may pass unnoticed in patient under deep sedation or GA. When patients state is also imaginable with (synergistic?) ketamine-RF. Operations where the patient probably benefits the most by “conscious sedation” (the deepest level when performed by non-anesthesiologists) are long-lasting procedures and/or difficult positions (is RA really indicated?), noisy environments (e.g. orthopedics), claustrophobic conditions, … When patients do not want to hear, see, remember or feel anything the question arises about the opportunity of the selected technique. It may be questioned whether a combination of a CNB with sedation should be promoted or really offers superior comfort for thoraco-abdominal interventions (open and endoscopic) in subjects with marked respiratory distress. Too easily it is argued that GA is contraindicated.

Conditions where a patient will less benefit from sedation are day-case procedures (where also premedication is rarely given), short-lasting interventions, patients with OSA, some specific operations (C-section). When patients need to remain completely immobile such as eye surgery it may be a dilemma between choosing between fully awake (mostly OK for short procedures) or some level of sedation. When patients are too much covered by towels and/or difficult to get simple access to their airways, sedation is less indcated as well. An interscalene block may cause upper airway compromise of which the symptoms may be difficult to separate from a snoring patient.

The anesthetist: The anesthetist must also benefit when a patient is sedated as he/she does not need to talk too much to the patient. However, communication and psychological support may be more helpful than the pharmacological approach (5). Patients rarely recall who performed the puncture, the quality of supervision, sedation is only safe in experienced hands i.e. anesthesiologists. Better not be brought into an anesthetic state also is imaginable with (synergistic?) ketamine-RF. Conditions where a patient will less benefit from sedation are day-case procedures (where also premedication is rarely given), short-lasting interventions, patients with OSA, some specific operations (C-section).

The patient: Sedation during block performance and/or the whole surgical procedure may ameliorate the comfort of the patient, though not free of untoward effects. In many articles it is unclear what is meant by ‘sedation’, ‘awake’ or ‘anesthetic effect’. In less experienced hands lacking knowledge of effect site equilibrium, time conscious sedation may convert into an unresponsive state or delirium endangering the free airway, respiration and the uneventful progress of the procedure itself. Especially with Midazolam doubling the dose may dramatically deepen the sedative level as opposed to diazepam. A conversion into a rather ‘anesthetic’ state is also imaginable with (synergistic?) ketamine-RF ‘amnestic’ combinations. Idealy it has been suggested that the patient should be able to report any discomfort while afterwards anamnesis should make that it will not be recalled. The outcome of such sedative level are quite narrow. Patients who really want to follow the surgical activities, eventually communicating with the surgeon, should better not be brought into an “amnestic” sedation. When patients are too much covered by towels and/or difficult to get simple access to their airways, sedation is less indicated as well. An interscalene block may cause upper airway compromise of which the symptoms may be difficult to separate from a snoring patient.

Many surgeons think that they can sedate patients themselves, supervising them at the same time or leave it to a nurse who may also needs to assist him/her. Sedation performed by non-anesthesiologists is mostly similar to standard care i.e. either too deep due to a lack of pharmacological knowledge or too superficially because of fear for deepening, while ignoring the quality of supervision. Sedation is only safe in experienced hands i.e. anesthesiologists.

References
appropriate sedation may actually decrease the risk of seizures by raising the threshold for local anesthetic-induced seizures. As to preventing cardiovascular local anesthetic toxicity, current data suggest that the most appropriate method to prevent intravascular injection is by slow, incremental administration of the local anesthetic solution containing a method of intravascular injection, while simultaneously monitoring the objective cardiovascular response, thus obviating the need to rely on patient report of any symptoms of intravascular injection. Therefore, there is no reason to believe that there is any advantage in avoiding blocks in anaesthetized or heavily sedated patients. In addition, it has been shown that sedation may prove beneficial since it can raise the threshold for manifestation of cardiovascular toxicity, such as early dysrhythmias and hypertension. Supports of not performing peripheral nerve blocks in anaesthetized or heavily sedated patients argue that awake patients can recognize impending nerve injury before it occurs and thus warn the clinician in time. However, it is debatable whether paresthesia or pain from an errant needle are specific or sensitive indicators of potential nerve injury. From series where blocks were placed under general anaesthesia and no patients complained of paresthesia, it can be concluded that a paresthesia per se is not a specific indicator of imminent nerve injury. There have also been cases where nerve damage developed despite promptly terminating injections when patients complained about pain/paresthesia, suggesting that the patient’s warning is insufficient to prevent injury to the nerve. There is also always the possibility that the injury might have already occurred by the time the patient reports the paresthesia/pain and finally, there is never complete certainty that the reported neurological injuries were actually caused by the block itself and not by a non-block-related event, such as tourniquet ischemia, surgical trauma or traction. It has also been claimed that even if damage to neural structures occurs by the cutting edge of the needle, this can hardly be attenuated if noticed early, since in no case can a disrupted group of nerve fibers spontaneously reconnect if the needle is removed immediately after the dissection. Therefore, with respect to the risk of nerve injury, there is insufficient data to draw meaningful conclusions as to whether the risk is increased when performing nerve blocks in anaesthetized or heavily sedated patients.

Supporters of performing regional blocks in anaesthetized or heavily sedated patients claim that this practice increases safety by diminishing the chance of the patient moving suddenly and causing damage to a vital structure. Also, it enhances patient acceptance, thus increasing the number of patients who will benefit from a regional technique. Finally, without general anaesthesia or heavy sedation, regional blocks would be impossible in the paediatric population, since infants and young children are unlikely to accept the restraints of regional anaesthesia practice, such as needles, nerve stimulators and cold ultrasound transducers. In addition, infants and young children are incapable of providing the vital information of accidental intravascular injection or articulating the feeling of paresthesia. Still in 1996, in a multi-institutional prospective study on 85,412 paediatric anaesthetics of which 24,409 involved a regional block, with more than 90% of which performed in fully anaesthetized infants and children, an extremely low rate of complications was reported. Recently, an analysis of an observational database of more than 50,000 paediatric regional anaesthesia blocks seeking at determining the incidence of postoperative neurological symptoms and LAST in relation of the patient’s state at the time of block placement (conscious, sedated, anaesthetized) showed that placing blocks under general anaesthesia was in fact safer, since the rate of neurological complications in awake and sedated children was more than seven times higher than that in children under general anaesthesia. The authors concluded that the practice of placing blocks under general anaesthesia should be considered safe and should remain the prevailing standard of care. In fact, heavy sedation or general anaesthesia is the standard practice of most paediatric anaesthetists, since it also makes the use of nerve stimulators and ultrasound easier, while diminishing the risk of sudden movements. Lastly, there are adult populations who bear the same limitations as do infants and children, such as patients with severe dementia, profound developmental delay, incapacitating mental illness, those with severe anxiety or chronic pain and those with an already compromised sensorium (who will not be able to provide appropriate feedback to the clinician even if awake). In these situations, the benefits of ensuring cooperation and immobilization outweigh the risks of performing regional blocks under deep sedation or general anaesthesia. In these situations, the benefits might come from performing regional blocks under heavy sedation or general anaesthesia, thus allowing patients who otherwise cannot cooperate to benefit from regional procedures.

Finally, even in the general surgical population, there is evidence supporting the use of general anaesthesia or sedation for block placements. In 2003, Horlocker et al reported epidural catheter placement in 4,298 fully anaesthetized patients undergoing thoracic surgery with no neurological complications. Similarly, in a recent large retrospective registry analysis of the effects of sedation and general anaesthesia on block-related complications and patient satisfaction, LAST and pneumothorax rates were independent of the state of consciousness while sedation during block performance enhanced the operating conditions and thereby minimized the incidence of multiple skin punctures, the risk of premature termination of the peripheral nerve block as well as the risk of primary failure. In the same analysis, sedation was associated with a significant improvement in patient satisfaction.

In conclusion, it remains controversial whether or not to perform regional blocks in anaesthetized or heavily sedated patients, with arguments on either side of the debate. It is very difficult to perform randomized controlled trials aimed at evaluating the impact of anaesthesia or heavy sedation on the risk of complications, since the outcome of interest is very rare and most conclusions are drawn from case reports and observational series. It is however expected that the introduction of novel techniques, such as ultrasound guidance and injection pressure monitoring will increase the effectiveness and safety of regional blocks irrespective of the state of alertness of patients, since with improvement in technology and increased provider expertise, future anaesthetic practice will rely less on patient’s feedback and more on objective measures.
The gabapentinoids or α2 δ modulators — pregabalin and gabapentin – are both indicated as first line agents for the treatment of neuropathic pain (eg postherpetic neuralgia) and as adjuvant therapy for seizure disorders. Pregabalin is additionally approved for the treatment of fibromyalgia and neuropathic pain associated with diabetes mellitus or spinal cord injury.

Over the last three decades, their perioperative prescription has become popular due to their analgesic and antihyperalgesic properties. Their use, as a component of multimodal preemptive, preventive or even protective approach towards postoperative pain management, has recently been emerging and published literature supports that their perioperative application reduces pain after surgery and has opioid-sparing effects. Currently, a large number of clinical trials and meta-analysis, examining the use of gabapentin peroperatively to reduce postoperative pain, and a smaller but growing number of clinical trials examining the efficacy of pregabalin, exist in literature. As a body of work, they support the conclusion that perioperative use of gabapentinoids reduces early postoperative pain and has opioid sparing effects. Additionally, data, regarding gabapentinoid efficacy in preventing the emergence of chronic postoperative pain (CPSP), are available for clinicians. Gabapentinoids, may contribute to better postoperative pain management, enhanced opioid analgesia, and prevention of opioid tolerance & CPSP. They also have anxiolytic and sleep-modulating properties, making them useful adjuvants in perioperative care, although they are unlikely to be of any benefit as sole agents for the management of acute postoperative pain.

Gabapentinoids exert their actions by binding to the α2δ accessory subunits of of pre-synaptic voltage-gated Ca2+ channels (VGCC), inhibiting neuronal calcium influx. This results in reduced release of excitatory neurotransmitters (glutamate, substance P, and calcitonin gene-related peptide) from primary afferent nerve fibres, thus suppressing neuronal excitation after nerve or tissue injury. They may prevent central sensitization and subsequent hyperalgesia and allodynia, with only minor effects on normal nociceptive pathways. Because α2δ subunits of VGCC interact with critical aspects of the neurotransmitter release process, gabapentinoid binding is also speculated to prevent transmission in nociceptive pathways. Gabapentinoids also reduce plasma membrane expression of VGCC, but this may have little direct effect on their therapeutic actions. In animal models of neuropathic pain, gabapentinoids exert an α2-δ-lytic action within 30 minutes, while most of their in vitro effects are 30-fold slower, taking at least 17 hours to develop. This difference may relate to increased levels of α2δ expression in the injured nervous system. Thus, in situations where α2δ is experimentally upregulated in vitro, gabapentinoids act within minutes to interrupt trafficking of α2δ subunits to the plasma membrane within nerve terminals. When α2δ is not up-regulated, gabapentinoids act slowly to interrupt trafficking of α2δ protein from cell bodies to nerve terminals. In addition, gabapentin may exert an analgesic effect by activating descending inhibitory noradrenergic pathways that regulate neurotransmission of pain signals in the dorsal horns of the spinal cord. Moreover, studies exist describing the relation between gabapentinoids and the pathways involving NMDA receptors. The activation of these pathways allows the expression of the anti–hyperalgesic properties of gabapentinoids. This improved understanding of the mechanism of gabapentinoid action is related to their slowly developing actions in neuropathic pain patients, to the concept that different processes underlie the onset and maintenance of neuropathic pain and to the use of gabapentinoids in management of postsurgical pain.

Although both drugs are absorbed by amino acid carriers, gabapentin absorption is limited to a relatively small part of the duodenum, whereas pregabalin is absorbed throughout the small intestine. The active transport of gabapentin in the duodenum is saturated, progressively higher levels of gabapentin ingestion yield progressively smaller increases in blood concentrations, a fact that explains why oral bioavailability is reduced when dose is increased. Conceptually, the non-linear uptake of gabapentin provides an upper border not only to efficacy, but also to adverse effects. In contrast, pregabalin appears to be absorbed throughout the small intestine and demonstrates linear uptake without transporter saturation at therapeutic concentration, with an oral bioavailability > 90% at all doses. Therefore, at least conceptually, pregabalin might demonstrate both increased efficacy and increased side effects in situations that require high doses. Both pregabalin and gabapentin exhibit minimal protein binding and are renally excreted, without significant metabolism. Pharmacokinetic interactions are minimal, though gabapentin absorption can be significantly impaired by antacids, even when given up to 2 h after dosing. This should be considered in preoperative situations calling for the use of such drugs. The elimination half-life ranges of gabapentin and pregabalin are 4.8–8.7 h and 5.5–6.3 h, respectively. Finally, dosing adjustment for both drugs must be considered in cases of renal dysfunction, based on Creatinine Clearance.

It is generally accepted that gabapentinoids are effective in reducing immediate–early postoperative pain and opioid consumption. This has been better established for gabapentin than pregabalin, although pregabalin has greater analgesic potency, a longer duration of action and a better pharmacokinetic profile (rapid absorption, more predictable oral bioavailability).

Their use perioperatively is currently off label, although their analgesic effects vary effects of various types of surgery, according to available evidence, are promising. Either drug can be given as part of multimodal perioperative analgesic plan, despite the fact that no evidence-based scientific data exist to predict the duration of analgesia after their use. In addition, the analgesic and opioid-sparing effects due to gabapentinoids administration do not necessarily correlate with reduced opioid consumption all the times, whereas, comparison of the effects of either drug between surgical subspecialties is lacking. For example, pain following gynaecological procedures does not correlate with that after major abdominal or orthopaedic surgery.

Gabapentinoids are effective for acute postoperative pain management, since they inhibit acute nociceptive process & CNS sensitization, prevent mechanical hyperalgesia in surgical procedures with pro–nociceptive mechanisms, reduce pain scores, have opioid sparing effect up to 30%, are effective and safe adjuvants to morphine, are optimal adjuvants to CNBs especially for TKA, reduce PONV, have anxiolytic & sleep modulating properties, prevent or reverse opioid tolerance and improve patients rehabilitation and satisfaction.

Gabapentin results in significant reductions in postoperative analgesic requirements 24 h after surgery such as abdominal hysterectomy, spinal surgery, vaginal hysterectomy, radical mastectomy and laparoscopic cholecystectomy. Its perioperative use has a significant 24-hour opioid sparing effect and improves pain score for both abdominal hysterectomy and spinal surgery. Nausea may be reduced in abdominal hysterectomy. A growing body of evidence suggests that perioperative administration of gabapentin, is efficacious for postoperative analgesia, preoperative anxiolysis, attenuation of the haemodynamic response to laryngoscopy and intubation and prevention of CPSP, perioperative nausea and vomiting, and other abdominal surgery related problems.

According to the results of a systematic review and metaanalysis response, including 133 RCTs and 9.829 patients, undergoing various types of surgery, prophylactic administration of gabapentin when compared versus placebo, resulted in reduced postoperative pain scores on a 10-point scale at 1, 2, 6, 12, 24 h by a mean of 1.68, 1.21, 1.28, 1.12 and 0.71 respectively [p < 0.001 for all], decreased mean 24 h morphine equivalent consumption by 8.44 mg [p < 0.001] and preoperative anxiety, PONV, or pruritus, and increased patients satisfaction, although type of surgery was not independently associated with these effects.

Pregabalin, when administered preoperatively in orthopaedic surgery, reduced pain scores at rest and mobilization at 24 h postsoperatively, decreased opioid consumption, and increased knee flexion at 90°, promoting early rehabilitation of these patients. In addition, according to a systematic review & metaanalysis in gynaecological surgery pregabalin resulted in statistically significant pain differences at rest, moving & cough, without any increase in adverse effects. Moreover, perioperative administration of pregabalin 300 or
600 mg, versus diazepam 10 mg, for premedication in patients undergoing laparoscopic hysterectomy, with the dose being repeated after 12 h, resulted in decreased oxydodeconum consumption.

As optimal pain relief after surgery is difficult to achieve with the use just one drug, many pain experts advocate the use of two or more classes of medications as to counter possible side effects from any one medication. In a recent non-blind per- ioperative administration of the combination of celecoxib and pregabalin improved analgesia and caused fewer side effects, than either analgesic drug alone after spinal fusion sur- gery. Gabapentin or Pregabalin may be a very useful component of multimodal analgesia for prevention and possibly management of postoperative pain. The combination of gabapentin or pregabalin with a NSAID may provide the most ef- fective post-operative analgesia. Regarding CPSP, data were initially promising, although sometimes mixed & confusing. In part this ambiguity in effectiveness can be attributed to the fact that studies examining CPSP have been limited and underpowered, with small sample sizes, limited follow up and application in a variety of surgical procedures with widely varying dosing regimens and varying therapy durations from as little as one single dose to repeated dosing for 36 h after surgery, suggestive of the necessity for further well designed trials. Human clinical trials of perioperative gabapentinoids support the belief that gabapentin is helpful in reducing acute postoperative pain and opioid consumption whether given preoperatively or postoperatively. At least two trials have directly compared the administration of gabapentin 2 h preoperatively versus immediately postoperatively to nasogastric tube. Patients given gabapentin preoperatively, as well as those given gabapentin immediately postincision both demonstrated lower visual analog scale scores at all time points and used less fentanyl compared with the placebo group. However, there was no difference in total opioid consumption or pain scores at any time point between the pre- and postincision gabapentin treated groups. Additionally, in a study that examined preop and postop gaba- pentin versus preop gabapentin alone, patients who received gabapentin postoper- atively used significantly less morphine via PCA at 24, 36, and 48 h. Patients who received gabapentin postoperatively also had significantly better assisted knee flexion on postoperative day 2 and postoperative day 3 compared with those who received preop gabapentin alone. Furthermore, a Cochrane review that in- cludes data from four unpublished studies concluded that gabapentin is effective in already established acute postoperative pain even when dosed solely postoper- atively Thus, the existing data are at odds with preconceptions that preoperative dosing is critical for reducing immediate postoperative pain or opioid use.

Similarly, recently, investigators, used a crossover design to examine the effi- cacy of preoperative versus immediately postoperative administration of 75 mg of oral pregabalin. Patients were followed for 72 h after surgery, and the area un- der the curve for numerical rating scale in the first 24 h was significantly lower at rest for patients receiving postoperative pregabalin. However, the overall impres- sion conveyed by their data was that any difference that exists between preopera- tive dosing and postoperative dosing appears to be quite small. For this reason, we conclude that such a preoperative dose is desirable, but the failure to give such a dose should not dissuade the clinician from postoperative dosing.

Additionally, most of the studies that have examined the preoperative ad- ministration of the gabapentinoids have administered the preoperative dose be- tween 1 and 2 h before surgery. It has been reported that the time to peak plasma level after oral administration of gabapentin in humans is approximately 2 h and the time to peak plasma level after oral administration of pregabalin is approx- imately 1 h. However, it has also been reported that the time to peak cerebrospinal fluid level may be much longer. Among patients undergoing total knee replacement, peak cerebrospinal fluid levels of pregabalin occur at a median time of 8 h after administration. These data suggest that preoperative dosing may need to occur significantly earlier to exert its full opioid-sparing, pain-relieving (antihyperalgesic), and pain-preventing (preventative analgesia) effects. Regarding recommended dosing of perioperative gabapentinoids, higher dose regimens appear more effective than lower dose regimens. Dosing may be initiated preoperatively, intraoperatively, or postoperatively—all three regimens have been shown to reduce early postoperative pain. Optimal duration of treatment is unknown, but studies with the most compelling outcomes have given gabapentinoids for up to 2 weeks. The single best study demonstrating reduction of chronic pain was accom- plished with pregabalin; however, gabapentin has been studied perioperatively far more extensively. The overall data for reducing early postoperative pain and opioid use are most compelling for gabapentin. Either agents are appropriate and are recommended for patients at high risk of seizures or CPSP. In reference to side effects, these are mild and usually very well tolerated, including mild sedation which is sometimes necessary, dizziness, peripheral oeo- dema. According to case reports, even massive overdoses have been managed only with supportive care typically on an outpatient basis, although side effects postoperatively may sometimes necessitate dose reduction.

It is generally accepted that gabapentinoids are effective in reducing immediate–early postoperative pain and opioid consumption. This has been better established for gabapentin than pregabalin, although pregabalin has greater anal- gesic potency, a longer duration of action and a better pharmacokinetic profile. The answer to the question of “Do surgical patients benefit peripera- tively Gabapentin or Pregabalin?” and if their routine administration is recommended comes from a systematic review on efficacy and safety of these two drugs, pub- lished some years ago. The authors concluded that Gabapentinoids effectively reduce postoperative pain, opioid consumption, and opioid–related adverse ef- fects after surgery. Conclusions about the optimal dose and duration of the treat- ment cannot be made because of the heterogeneity of the trials. Further studies are needed to determine long term benefits of peripertive gabapentinoids.

**References**


**PRO CON DEBATE 11: A2 DELTA MODULATORS SHOULD BE USED ROUTINE IN THE PERIOPERATIVE PERIOD**

**ESRAA Abstracts**

**CON**

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More than 20 years ago, Gabapentin was first reported as providing pain re- lief. From then on, Hunter et al. underlined that despite the ability of gabapentinoids to acutely reverse a prominent manifestation of neuronal sensi- tization, the negligible effect of these drugs against an acute, high threshold ther- mal noxious stimulus suggests a selective interaction with pathways associated with pathophysiological events rather than with normal sensory nociceptive functions. Indeed, gabapentinoids display inhibitory activities after nerve ligation, osteoarthritis, cancer-induced bone pain and opioid-induced hyperalgesia but neither gabapentin nor pregabalin inhibit acute nociceptive responses.

**Part 1: The Fundamental Side:**

**Gabapentinoids and the voltage-gated calcium channel:** The voltage-gated calcium channel (VGCC) is one of the targets of gabapentinoids. The drugs bind mainly to the \( \alpha_2 \delta \) subunit, which is in charge of anchoring \( \alpha_2 \beta_1 \) complex to the membrane. \( \alpha_2 \beta_1 \) subunits are reduced by chronic pregabalin administration and meanwhile, the drug alleviates the induced neuropathic pain. Moreover, at the spinal level, gabapentinoids are able to decrease the VGCC recycling pathways through the inhibition of PKC and Rab-11 are also promoting the intracellular recycling of the VGCC.

After nerve ligation, rats exhibit increased levels of \( \alpha_2 \beta_1 \) subunits in pre- synaptic terminals of primary afferent fibres in the dorsal horn. Consequently, the trafficking of VGCC from the site of synthesis to the membrane of the pre- synaptic terminals is accelerated. Interestingly, the up-regulation of the \( \alpha_2 \beta_1 \) subunit is reduced by chronic pregabalin administration and meanwhile, the drug alleviates the induced neuropathic pain. Moreover, at the spinal level, gabapentinoids are able to decrease the VGCC recycling pathways through the inhibition of PKC and Rab-11. These results underline the fact that neuro- logical pathways modify intracellular pathways and consequently create the conditions for gabapentinoids to exert their analgesic properties.

**Gabapentinoids and the NMDA receptor:** Increased expression of the VGCC at the synaptic membrane, promote calcium influx into the cell and conse- quently the release of excitatory amino acids in the synaptic cleff. Indeed, in- creased pre-synaptic glutamate release, inducing the activation of AMPA and NMDA receptors, has been recorded in transgenic mice overexpressing the \( \alpha_2 \beta_1 \) subunit. These mice exhibit tactile allodynia that is reversed by intrathe- cal NMDA receptor antagonists. Moreover, oral gabapentin administered to volunteers, suppresses cutaneous hyperalgesia following heat–capsaicin sensiti- zation while pain threshold in normal skin is not modified. Similarly, pregabalin reduces electrical-induced hyperalgesia and allodynia in volun- teers. These studies describe the relationship between gabapentinoids and the pathways involving NMDA receptors. The activation of these pathways allows the expression of the anti-hyperalgesic properties of gabapentinoids.

**Gabapentinoids and Opioid-induced hyperalgesia:** Opioid-induced hyperalgesia (OIH) leads the patient to a paradoxical state of heightened pain sensation. This side effect has been extensively described with remifentinal

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and defined as acute opioid tolerance in the perioperative period. 


References


Some might argue that it requires extra time and lower need for intraoperative analgesic supplementation. This is particularly important in light of the fact that the density of the block is less and need for intraoperative analgesic supplementation is higher with an epidural technique compared to a spinal technique. So are there any drawbacks from adding epidural lipophilic opioids? There might be a higher incidence of pruritus, although both studies investigating the addition of fentanyl to epidural local anesthetic have shown an existing lipophilic epidural catheter to report a statistically significant increase in the risk of pruritus. 10,16 Some might argue that it requires extra time in an emergency or that mixing errors might occur, but there is no need to mix the lipophilic opioid with the local anesthetic, and it can just be given separately as an epidural bolus after administering the local anesthetic.

In summary, lipophilic opioids enhance the quality of the neuraxial technique for CD in elective cases and in women with an existing epidural catheter. Avoiding their use increases the risk of intraoperative pain and need for intraoperative analgesic supplementation.

References

Introduction: Converting an epidural labour analgesia to an epidural surgical anaesthesia for cesarean section is a very common procedure. Many different local anaesthetic solutions and various adjuvants have been proposed to achieve this goal and a wide variation in practice is reported (1,2). No general agreement on the optimal solution, ideally providing a rapid onset and good quality of block for the entire duration of the surgical procedure. One part of the controversy is related to the benefit of adding a lipophilic opioid to the LA solution in order to optimize the quality of the epidural anaesthesia. The present lecture will be dedicated to demonstrate the absence of benefit of adding a lipophilic opioid in the particular setting of providing a surgical anaesthesia for c-section in a patient with an epidural catheter in situ for labour analgesia.

Variation in practice in several surveys: Different surveys have investigated the current practice in converting an epidural analgesia to an epidural anaesthesia for an unplanned cesarean section. In a 2008 survey in UK investigating 209 obstetric units, 13 different combinations of LA with or without epinephrine and/or bicarbonate were reported but none with lipophilic opioids (1). Conversely, in a 2016 Scandinavian survey investigating the same procedure, a lipophilic opioid was added in 50% of the cases (2).

Efficacy of lipophilic opioids combined to local anaesthetics in elective cesarean section: In elective cesarean sections, adding fentanyl 75–100 mg to bupivacaine 0.5% has been demonstrated to increase the quality of inotropically antagonized analgesia without altering the speed of onset nor the duration of the sensory and motor blockade but with an increase in maternal pruritus (3).

Adding 100 mg fentanyl to the epidural solution has also been demonstrated to improve the quality of postoperative analgesia and to decrease the need for intraoperative supplementation with alfentanil or enoxon (4,5) without depression of the term neonate (6).

Similarly, adding sufentanil 20 to 30 mcg to 0.5% bupivacaine has been demonstrated to improve the quality of analgesia without jeopardizing the safety of the neonate (7).

Lack of efficacy of lipophilic opioids combined to local anaesthetics administered in an epidural top-up for unplanned cesarean section during labour: Converting an epidural labour analgesia to an anaesthesia for cesarean section is very common.

Lipophilic opioids (fentanyl or sufentanil) are commonly used as adjuvants for labour epidural analgesia. Their use allows a reduction of the LA concentrations required to achieve an effective labour analgesia and a reduction in the incidence of motor blockade associated with instrumental extractions (8,9). Their efficacy is dose related (10,11). They increase the success rate of epidural analgesia (12).

It is questionable whether additional administration of a lipophilic opioid in a top up to achieve surgical anesthesia for a cesarean section in a patient already receiving this opioid during labour analgesia would confer additional benefit or if the repeated epidural administration of this lipophilic opioid during labour produces a near-maximal effect and that additional dosing would not provide additional benefit. Many anesthesiologists add a lipophilic opioid to the LA solution when topping up an epidural, expecting a better quality of block and a reduction in the need for any analgesic supplementation as well as a reduction in onset time. However, in non elective cesarean-section in women receiving fentanyl containing epidural analgesia, the addition of fentanyl 75 mcg to 0.5% levobupivacaine for epidural anesthesia did not alter the onset time nor the need for intra-operative supplementation but increased the incidence of nausea and vomiting (13).

In a meta-analysis addressing the question of the best epidural solution for emergency cesarean section, the authors concluded that adding fentanyl 50–75 mcg to a lidocaine + epinephrine reduces the onset time without altering the need for intra-operative supplementation (14).

This meta-analysis can be criticized due to the diversity of protocols and end-points, particularly concerning onset time and all the trial investigating lidocaine + epinephrine with or without fentanyl showed a median onset time shorter than 15 min making surgical readiness comparable with general anesthesia. (15). The authors of this meta-analysis conclude that if the speed of onset is important, then lidocaine + epinephrine solution, with or without fentanyl, appears optimal (14).

In a prospective audit of regional anesthesia failure for 5080 cesarean sections, a 24% failure rate was reported with epidural top-up. The use of many different solutions precluded the analysis of the impact of adding or not a lipophilic opioid (16).

Similarly, in a review and meta-analysis on risk factors for failed conversion of labour epidural analgesia to cesarean delivery anesthesia, the use of lipophilic opioid in the top-up solution was not evaluated and therefore not identified as a factor reducing the failure rate (17).

In addition, it must be kept in mind that any hypothetic potential benefit in speed of onset could be negated by the increase in time taken to prepare the mixture. Moreover, the use of a combination of various drugs increase the risk of errors, especially when prepared under the pressure of time.

For these reasons, epidural lipophilic opioids are not needed when an epidural top-up is given to achieve anaesthesia for c-section.

References


PRO CON DEBATE 14: REGIONAL ANAESTHESIA PREVENTS POSTOPERATIVE COGNITIVE DYSFUNCTION

ESRA7-0469

CON
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Postoperative cognitive disorders including postoperative delirium (POD) and postoperative cognitive dysfunction (POCD) are increasingly being recognized as major postoperative complications. For both entities, alarming high incidences of up to 50% and higher have been documented. (1,2) POD and POCD affect particularly the geriatric population and are associated with important short- and long-term effects on an individual and socio-economic level, including an increased hospital length of stay, loss of functional independence, persistent cognitive decline and an excess in mortality. (1–3)

Both POD and POCD have a multifactorial pathogenesis and a complex pathophysiology that are still only poorly understood.

The pathological pathways underlying POD involve – amongst others - the activation of proinflammatory pathways, cerebral endothelial dysfunction and neurotransmitter imbalance. The development of POD is facilitated by predisposing factors, i.e., patient-related risk factors that cannot be modified such as pre-existing cognitive impairment or alcohol abuse. Moreover, there are important risk factors that trigger POD and should be avoided/treated perioperatively in vulnerable patients, including centrally acting medications and pain.

Theoretically, the use of regional anesthesia (RA) could be advantageous in patients at risk for POD as RA offers highly effective pain control, helps to minimize the use of centrally acting analgesics and has anti-inflammatory properties. However, the evidence is disappointing with the vast majority of studies failing to demonstrate superiority of RA over general anesthesia (GA) with respect to the occurrence of POD. (4,5) This equipoise could be based on the use of – frequently only poorly controlled – sedation in patients undergoing RA. If at all, sedation of patients receiving RA should only be used when controlled by appropriate depth of anesthesia monitors. (6)

The pathophysiology of POD remains elusive with inflammation and pain being known to carry a cognitive burden. (7) While experimental studies implicated general anesthetics to be involved in the development of POD, recent clinical studies have challenged the pathogenetic role of GA.(8) In line with this, several studies have failed to demonstrate a benefit for RA with respect to the prevention or alleviation of POD. (5,9)

In conclusion, there is at current no evidence that RA prevents postoperative cognitive complications.

References

ESRA7-0872

REGIONAL ANAESTHESIA PREVENTS POSTOPERATIVE COGNITIVE DYSFUNCTION


The occurrence of postoperative cognitive dysfunction (POCD) is frequent and represents a severe event (1,2). At first glance, it seems quite evident that protecting the patients from drugs that act directly on the brain, loco-regional anaesthesia (LRA) would be able to limit the incidence of POCD. However, things are not so simple and deserve to be more precisely addressed. Many attempts have been made to characterize the logical hypothesis that LRA, as compared to general anaesthesia (GA), may reduce the risk of POCD. A vast majority of these reports failed to demonstrate any significant differences. In a population of elderly patients, an insignificant difference on cognitive status was found only during the immediate postoperative period (13.9% after LRA and 14.3% after GA) (3). A recent meta-analysis, performed on orthopedic major joint surgery, found a very weak difference in psychomotor status, in favor of LRA, but limited to the first postoperative hours, without any difference thereafter (4). Similar conclusion had been drawn in high risks patients operated on carotid surgery (5). This raises the question of definition and methodological approach because it is usually considered that, as opposed to delirium, cognitive dysfunction occur after a delay of 2 to 3 days after the surgery. Nevertheless, it would be wrong to conclude from these quite disappointing results that LRA could not have any beneficial effect. Let us go a little bit further. The occurrence of POCD is under the influence of many factors. Among these factors, the stress response to surgery, i.e. metabolic and inflammatory reactions, is recognized as playing a significant role (6). Stress response is triggered by the type of surgery (major vs minor), pain intensity, anxiety, hypothermia…. For instance, dysregulation of cortisol secretion within the postoperative period is significantly associated with POCD (7). Similarly, inflammation, as reflected by cytokine secretion levels, seems to be involved in POCD (8), explaining why NSAIDs have a preventive action on cognitive dysfunction in elderly patients (9). Pain and cognitive function are connected at the level of the cingular cortex (10), suggesting a putative preventive effect on POCD by optimal pain control. LRA provides a reduction on operative stress response by providing optimal pain relief and by the reduction of the inflammatory and metabolic responses to surgery (11). Moreover, patients under LRA are less subject to the risk of perioperative hypoxia that is recognized as a contributing factor of cognitive dysfunction (12). In this perspective, it is not surprising that optimal analgesia by LRA could reduce the incidence of cognitive dysfunction after knee arthroplasty (13).

In conclusion, LRA by providing optimal analgesia, by reducing the use of central-acting drugs and by preventing surgical stress to surgery and postoperative inflammation may be expected to be able to reduce the incidence of POCD. However, this is especially difficult to demonstrate, partly because of the multifactorial origins, as well as because of methodological issues (selection bias, confounding factors……).
(3) As these hemodynamic side effects can be detrimental in patients with vascular resistance and left ventricular filling (as a consequence of venodilation). Neuraxial anesthesia is known to decrease mean arterial blood pressure, systemic vascular output, and further hypotension. Due to its sympathicolytic effects, avoidance/immediate treatment of a decrease in venous return and hypotension countered cardiac valve stenosis, with severe aortic stenosis being prevalent in these patients. (4) However, it remains to be proven whether general anesthesia is definitely safer in this vulnerable patient population. The majority of iv-narcotics used for induction of general anesthesia do also significantly affect cardiac afterload, preload and contractility. Instead of banning spinal anesthesia in patients with cardiac valve stenosis, anesthesiologists should focus on the safe conduct of spinal anesthesia by employing techniques suited to minimize arterial hypotension, i.e., low-dose spinal anesthesia and (for longer procedures) the use of spinal catheters allowing the repetitive administration of small doses of the local anesthetic. Low-dose spinal anesthesia titrated via a catheter has been repeatedly demonstrated to be hemodynamically superior in comparison with single-dose spinal anesthesia or general anesthesia, even in elderly and cardiac risk patients. (5,6) Also in parturients with complex congenital heart disease, central neuroaxial blocks have been safely used. (7)

In conclusion, the choice of the technique (regional vs. general anesthesia) in patients with cardiac valve stenosis remains irrelevant as long as the anesthesiologist prevents the occurrence of hypotension. This is confirmed by a recent survey from the UK investigating more than 10,000 patients undergoing hip fracture surgery. In these patients, mortality was not linked to anesthesia technique, but clearly (and solely) associated with (even minor) falls in blood pressure. (8)

References

suggesting a more favourable profile for ropivacaine. The advantage of ropivacaine causing less motor block than bupivacaine however, only becomes clinically relevant after prolonged administration and might more likely be attributable to differences in potency, rather than intrinsic differences between ropivacaine and bupivacaine.

In case of inadvertent intravenous administration, local anaesthetics can be toxic for both the central nervous system (CNS), causing tinnitus or seizures, and the cardiovascular system, causing hypotension and ventricular dysrhythmias. CNS symptoms occur at lower blood levels than cardiovascular symptoms. Some studies show no difference in (cardiac) toxicity for ropivacaine and bupivacaine, other studies show a larger convulsive dose for ropivacaine compared to bupivacaine. However the doses in the latter studies are higher than currently advised in literature for epidural labour analgesia (respectively 0.1% and 0.0625% for ropivacaine and bupivacaine, both in combination with fentanyl or sufentanil). Using these dilute concentrations cardiac toxicity is very unlikely.

Considering maternal outcome, ropivacaine and bupivacaine are equally effective for labour analgesia in terms of maternal satisfaction, ability to ambulate (despite the motor block effect) and progress of labour. Studies showing a higher incidence of instrumental vaginal delivery when using bupivacaine, are studies based on bupivacaine concentrations of 0.25%. When using dilute concentrations of ropivacaine and bupivacaine, there is no difference in spontaneous vaginal delivery, instrumental vaginal delivery or caesarean delivery, neither are there differences in feotal or neonatal outcome.

Considering the above, there is a lack of consistent evidence in literature to support the routine use of ropivacaine over bupivacaine for epidural labour analgesia, showing both ropivacaine and bupivacaine suitable for epidural labour analgesia in dilute concentrations. Taking into account the higher costs of ropivacaine ($-10 fold), bupivacaine might be a better alternative to ropivacaine.

References

PRO CON DEBATE 16: ROPIVACaine IS THE LOCAL ANAESTHETIC OF CHOICE FOR LABOUR EPIDURAL ANALGESIA

ESRA7-0507

PRO

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Introduction: Among the amide local anesthetics bupivacaine, levobupivacaine and ropivacaine are suitable for labour analgesia, because of their long duration of action. However bupivacaine is the most cardiotoxic agent and it is more difficult to resuscitate patients from bupivacaine-induced cardiac arrest compared to the other local anesthetics. Bupivacaine also has important motor blockade at higher concentrations leading to instrumental deliveries. Ropivacaine is a racemate mixture of levorotatory (L) and dextrorotatory (R) forms. These forms behave different in their affinity to the site of action and in the sites involved with side effects. R-enantiomers contribute more to systemic toxicity, especially when used in high doses or inadvertent intravascular injection. Levo-bupivacaine, the pure s-enantiomer of bupivacaine was developed for better outcome. Ropivacaine, which is less lipophilic than bupivacaine, ropivacaine may be more selective for sensory fibres and less likely penetrates large myelinated motor fibres. Ropivacaine has less potential for central nervous system toxicity and cardiotoxicity. Convulsive dose (convulsion threshold) is 1,5-2 times larger for ropivacaine than bupivacaine on a mg/kg basis, even when correcting for the greater potency of ropivacaine. At equal (mg/kg), high doses, ropivacaine shows less motor block than bupivacaine and thereby more spontaneous deliveries. Because ropivacaine is 60% as potent as bupivacaine, equipotent doses should be used to compare the two drugs. Diverse dosing regiments were compared from 0,25% to 0,075% supplemented with opioids. It seems that ropivacaine 0,1% with opioid produces adequate pain relief with little or no motor block compared to bupivacaine, especially during longer labours. Side effects like nausea, vomiting, hypotension, pruritus and respiratory depression were similar among ropivacaine and bupivacaine used in low doses. No difference in oxytocin use was observed. Neonatal outcome is not different among the two local anesthetic agents.

Because of less risk for cardiotoxicity and neurotoxicity and less motor blockage during longer labours ropivacaine should be used as first choice in labour analgesia.

Key words: bupivacaine, ropivacaine, labour analgesia, toxicity

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**PRO CON DEBATE 17: THE ADDUCTOR CANAL BLOCK IS THE BEST blocks for POSTOPERATIVE ANALGESIA AFTER TKA**

**ESRA7-0509**

**PRO**

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Along with the development of enhanced recovery after surgery protocols, there has been an increased focus on early rehabilitation and a need to avoid impaired mobilization after surgery. To meet the challenge of providing adequate pain relief without compromising muscle strength, the motor-sparing adductor canal block (ACB) was introduced as an alternative to the femoral nerve block (FNB). The only motor fibers traversing the adductor canal are those of the nerve to the vastus medialis, making the ACB a predominately sensory nerve block.

The ACB has been shown to provide efficient postoperative pain relief in patients undergoing total knee arthroplasty (TKA). Pain and opioid consumption is reduced with reference to placebo, and the pain-relieving effect seems to be similar to that of the mainstay treatment – the FNB. Most importantly, the ACB offers a unique advantage over FNB, which is its ability to be performed under ultrasound guidance. This makes it a very safe and effective method of pain control, particularly in patients with a history of failed back surgery. The ACB is not yet a fully developed technique and the name of the block may change over time. The ACB is not yet a fully developed technique and the name of the block may change over time. The ACB is not yet a fully developed technique and the name of the block may change over time.

The ACB is currently the preferred nerve block for patients undergoing total knee arthroplasty (TKA). It is a motor-sparing block that provides effective pain relief and reduces the risk of postoperative complications.

**CON**

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Failed back surgery syndrome (FBSS) is present in about 30% of the patients who have undergone surgery involving the discs of the lumbar spine. It is characterized by maintenance of a chronic painful state, wherein the original back pain source(s) was either not properly addressed by the surgery or an additional idiopathic source of pain existed that could not be treated by such a surgical intervention. FBSS may also describe patients that have acquired a new back pain condition after spinal surgery.

Various therapeutic approaches are currently used to treat refractory chronic back and leg pain after spinal surgery.1 Presently, spinal cord stimulation (SCS) is considered as a relatively late stage treatment for FBSS.2 This utilization late in the continuum of care is surprising as both Level 1 and Level 2 evidence exists indicating traditional SCS is a safe, clinically-effective and cost-effective treatment.3,4 Technological advancements such as novel waveforms, higher stimulation frequencies and new anatomical targets have vastly expanded the field. SCS, resulting in greater effectiveness and broader applicability of this treatment. Additionally, these approaches may provide a rescue treatment for patients who have previously failed surgical and less invasive therapies, offering relief to a patient population among the most difficult to treat.


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causing sudden surges and shocks that may become less tolerable over the time. 2-19 Persistent paresthesias associated with low-frequency SCS and loss of efficacy from other unknown causes may result in attrition or “tolerance” in FBSS patients. SCS for the treatment of chronic pain is becoming a fast advancing field of neuromodulation. Thus, it is difficult to predict how and where evidence shall lead the field for the next 5-10 years when it comes to various stimulation frequencies and modalities of SCS treatments for FBSS. This article will provide an overview of current evidence and highlight recently published new waveform studies that have produced genuine excitement in the field of neuromodulation.

One of the most studied indications for SCS is FBSS in the form of persistent radicular pain after any lumbar disc surgery. When it comes to use of traditional low-frequency SCS for FBSS, two randomized controlled trials and numerous retrospective studies have been published. Summarizing data collected over more than 25 years, traditional low-frequency SCS at any given time interval provides approximately 50% pain relief in about 50% of the patients. Outcomes remain unchanged from an early SCS era (before 1995; 2,9) until now. 10-12 The two most cited, and the only randomized prospective trials on the use of traditional low-frequency SCS specifically for FBSS, are those from North et al. and Kumar et al. 13 In addition, recently Kapural et al. 14 provided further evidence for both traditional and high-frequency SCS at 10 kHz treatment of back and leg pain in a prospective, randomized comparative study with long-term outcomes. North et al. enrolled 50 subjects in a crossover study, treating subjects with either SCS or spinal revision surgery. Forty-five of those subjects were followed for up to 3 years. Nine of 19 subjects (47.4%) with SCS and 3 of 26 subjects (11.5%) that underwent repeated surgery had greater than 50% pain relief. The crossover rate was lower in the SCS group than in the group receiving additional surgery (5/24 vs. 14/26, respectively), indicating patient preference for SCS over repeated surgery. 15

Dr. Kumar and his group studied 100 patients who had predominant neuropathic leg pain after spinal surgery in the PROCESS study. 16,17 Patients were randomized to either receive maximal conventional medical management (CMM), or maximal CMM plus SCS. At 6 months, 48% of the patients who had been treated with SCS had more than 50% pain relief, while only 9% in CMM group reported similar pain relief. The crossover rate at 6 months was much lower in the SCS group. Moreover, at 6 months, patients randomized to SCS achieved significantly greater improvement in functional capacity and quality of life compared to CMM patients. Long-term follow up of 12 months reported in Kumar et al. (2007) demonstrated that the SCS group experienced improved pain relief, better quality of life and functional capacity, as well as greater treatment satisfaction than the CMM group (p ≤ 0.03). At 24 months, 37% of patients in the SCS group continued to achieve at least 50% pain relief vs. 2% of patients in the CMM group (p = 0.003).

The two clinical studies of 10 kHz SCS provided consistent set of data, and much better clinical efficacy 18-19 than traditional SCS setting a new efficacy standard that emerging waveform modalities of SCS should match or exceed. Based on the current status of clinical evidence, paresthesias during SCS are not essential that emerging waveform modalities of SCS should match or exceed. Based on the current status of clinical evidence, paresthesias during SCS are not essential for pain relief and have proven to be uncomfortable, limiting the acceptable time interval and amplitude of low-frequency stimulation.

Burst stimulation utilizes complex programming to deliver a 40 Hz burst mode, each burst consisting of 5 spikes at 500 Hz spike delivered in a constant current mode. 15 Using this methodology, paresthesia-free stimulation can be achieved in > 80% of the patients. It was suggested that burst stimulation may specifically activate lateral peripheral pathway by the medial pathway by activating the dorsal anterior cingulate and the right dorsolateral prefrontal cortex, and that was modulating the affective component of pain. 11 There is no direct evidence on the effect of burst stimulation.

SCS has been under peer and public scrutiny because of possibility of severe complications related to nerve damage, bleeding or infection. The occurrence of the most common complications of SCS for FBSS, including uncomfortable paresthesias, pain at the implantation site, and lead migration, have drastically decreased over the last 5 years. Using more portable systems, better anchors and anchoring techniques, and better practice guidelines may influence the rate of complications.

Infection, either superficial, deep, or epidural abscess is the most concerning complication of SCS system implantation. Wound dehiscence and/or device erosion, and presence of seroma may relate to surgical technique and patient’s co-medications. Neurocutaneous hematomas are rare, but a serious complication of SCS implantation. Currently, proper guidelines exist for management of a patient on anti-coagulation medications. Nerve damage including quadriparesis has been described in literature. Dural puncture and headache are common complications observed when the typically large, 14G, needle placement into the epidural space erroneously advances intrathecaly, producing a so called “wet tap”. Other complications are less frequent and include immunologic reactions, epidural fibrosis, renal failure, nausea or even diarrhea. 14,15

Psychosocial evaluation for implantable devices requires detailed testing inventories, but should also explore patient expectations, presence of psychological disease, and barriers to proposed treatment. 16 Such evaluation improves long-term outcomes of SCS. Large et al. reported a 33% success rate of SCS trialing in psychologically “screened” patients and a 70% rate in “screened” patients. 17 North et al. suggested that certain psychological variables are associated with pain relief during the trial, after implant, but not at longer follow-up. Proper assessment of pain relief, improvement in function, and patient satisfaction during the trial together may improve its predictive value. 18 Mood disorders such as depression and anxiety are the most common psychological comorbidities associated with disabling medical conditions and may not be obvious because of an individual’s adaptive coping. Therefore, in addition to regular assessments, psychological interventions may need to be implemented before trialing, or post-implantation of the system. Patients with somatization disorders or emotional reactivity may be more likely to have a positive trial followed by ineffective SCS therapy. 18 Intolerance to paresthesias, when traditional low-frequency SCS is used, is more likely in those with somatic preoccupation, hyposthesia, obsessive-compulsive tendencies and anxiety upon psychological testing. 19

References

PROBLEM BASED LEARNING DISCUSSION 2: INTERVENTIONAL MANAGEMENT APPROACH FOR CHRONIC PANCREATIC PAIN

ESRA7-0517

INTERVENTIONAL MANAGEMENT APPROACH FOR CHRONIC PANCREATIC PAIN

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Chronic pancreatitis is a progressive inflammatory disease of the pancreas that eventually leads to irreversible morphological changes of the pancreatic exocrine tissue and duct (1,2).

Sympathetic innervation of the pancreas comes from splanchnic nerves, while parasympathetic fibers originate from vagus. The acinar pleura within pancreas contains sympathetic and parasympathetic fibers. While the parasympathetic system stimulates exocrine and endocrine secretion, sympathetics inhibits the same. Sensory fibers are widespread within pancreas, especially dense around the acinar cells (1,4). Pancreatic pain can be broadly categorized into three types: nociceptive pain, neuropathic pain, and neuroinflammatory pain. Patients with chronic pancreatitis may have co-existing conditions and potentially multiple pain generators, and/or overlapping co-existing psychological disturbances, substance abuse/ misuse, or even a central pain component (1,2).

Inaccurate medical history, proper medical examination, enteroic screening, diagnostic imaging, and laboratory tests should help to exclude other conditions causing abdominal pain, such as chronic abdominal wall pain (CWP), intra-abdominal malignancy, and/or referred pain from other sources.

Transversus abdominis plane (TAP) block is a newer diagnostic and therapeutic block that may also help to treat abdominal wall pain, but also to
distinguish soma-sensory from visceral and central origin of abdominal pain (5). Local anesthetic is injected under ultrasound guidance between internal oblique and transversus abdominis muscles, a potential space named transversus abdominis plane (TAP) (5). This should relieve pain from most of the anterolateral abdominal wall from the costal margin down to the inguinal ligament (5). The diagnostic role of a TAP block to determine the abdominal wall source of pain has not been established yet, however, both, single injection, or a continuous infusion has been used for treatment of CWP.

While pain descriptors and locations can be helpful in delineating the source of pain, there is enormous variability in patients’ descriptions of pain related to chronic pancreatitis. Even more, in patients where the exact source of pain is questioned, differentiating between referred visceral pain from somatosenory and centrally-mediated pain may require another interventional diagnostic procedure, the so called retrograde differential epidural nerve block. Until now, there are few reports documenting the valid diagnostic role of retrograde differential epidural block (6).

Managing and minimizing chronic pain is often the objective of advanced pain management. Lifestyle changes such as abstinence from alcohol, smoking cessation, nutritional consultation, and regular physical exercise may help. Acetaminophen is often given early, but also nonsteroidal anti-inflammatory drugs (NSAIDs). Membrane stabilizers and antidepressants for chronic pain are used predominantly for neuropathic pain, but can also be used for chronic abdominal pain. Calcium channel blockers such as pregabalin or gabapentin may be effective in some patients and may provide an opioid-sparing effect (7). Good pain control and a decrease in opioid consumption over many months can be also achieved with repeated ketamine intravenous infusions (2). Short-acting opioids may be used for moderate to severe breakthrough pain.

While conservative measures, including medication, do have a role in pain management of chronic pancreatitis, the increasing safety and effectiveness of interventional pain treatments provides a useful therapeutic alternative. In addition, longevity of the pain relief and ability of such approaches not to conceal any acute abdominal co-morbidities, provides basis to execute such interventional treatments earlier in the algorithm of pain management of chronic pancreatitis (1.2).

A transceliac plexus block using local anesthetics is still the most frequently performed sympathetic block for control of pain from chronic pancreatitis and involves placement of the needle through the paraspinal area of the middle back to the anterior aspect of the mid L1 vertebral body (1.2). Less utilized, mainly for the fear of pneumothorax, but more efficacious, is a T11 bilateral splanchnic block. Final position of the tip of the needle is within paravertebral compartment medial to the pleural cavity, and in close proximity to the greater and lesser splanchnic nerves (posterior third of T11 vertebral body; (8)). While both techniques can be employed for chronic pancreatitis-related pain, the T11 splanchnic approach seems to provide a longer time interval of pain relief than the bilateral celiac plexus block (8).

Radiofrequency denervation of bilateral splanchnic nerves provides prolonged relief of chronic pain from chronic pancreatitis. In a few larger case-series, substantial pain relief, decreased analgesic use, and improved quality of life were achieved for many months (1.2).

While spinal cord stimulation (SCS) has been utilized for decades to treat various pain syndromes, only recently has chronic visceral abdominal pain become a target for electrical stimulation (9,10). For long-standing chronic abdominal pain of visceral origin, spinal cord stimulation of the dorsal columns has surfaced as an interesting therapeutic option to provide long-term, non-pharmacologic control of severe chronic visceral pain, and improve quality of life (1.2,9,10). It is not clear how spinal cord stimulation controls chronic abdominal pain and visceral hyperalgesia. Pain relief may be achieved by the activation of supraspinal pain modulatory pathways by SCS, release of inhibitory neuromodulators such as GABA, or blockade of nerve conduction by antidromic activation. Antidromic activation of peripheral sensory fibers may suppress the afferent input that is related to visceral hyperalgesia. Sym pathetic system may be affected down-regulation of segmental or supraspinal sympathetic outflow (9,10). It seems that SCS in particular provides the most promising long-term treatment option to date for ongoing pain when it is utilized in patients with the stable chronic form of chronic pancreatitis.

References


7. 011;141:536–543. This is a first trial documenting successful use of membrane stabilizers for chronic pain from pancreatitis.


PROBLEM BASED LEARNING DISCUSSION 12: MY PATIENT PRESENTS WHIPLASH INJURY- WHAT TO DO?

ESRA-0490

MY PATIENT PRESENTS WHIPLASH INJURY- WHAT TO DO?

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The best of both worlds - Fluorescopy and ultrasound combined cervical medial branch block and radiofrequency denervation: Abstract: In the format of mini-review the authors look at increasing incidences of whiplash injuries, their diagnosis, natural progress and prognostic factors. Authors highlight the recent research on brain plasticity and change in regional cerebral blood flow (r-CBF) associated with whiplash. Treatment modalities of WAD are discussed in relation to time from the injury. Role of education and physical therapy at the initial phase, pharmacotherapy throughout and interventional techniques available at the specialist pain clinic in the late phase are discussed. The role of musculoskeletal trigger points injections under ultrasound are given special attention and a new dimension. The most effective management of WAD based on EBM-cervical medial branch (CMB) block and radiofrequency denervation (RFD) is discussed. Anatomy of the cervical facet joints and medial branches is fully described. Precision of the final needle position for the favourite outcome is emphasized along with other methods to increase efficacy. Combined technique of fluoroscopy and ultrasound for CMB, based on 328 cases from St George’s University’s Chronic Pain Service, is presented showing benefits of both visualisation techniques to improve accuracy as well as safety of the procedure. Epidemiology: Neck pain has been ranked the fourth leading cause of disability in the United States according to 2010 Global Burden of Disease. 1 Feier et al. investigating epidemiology of neck pain in a systematic review, found a mean annual prevalence rate of 37.2% and lifetime prevalence of 50%. 2 Whiplash injury or whiplash associated disorders (WAD) are triggered by acceleration-deceleration injury from motor vehicle accidents or sport injuries and are common causes of neck pain. Episodes of WAD has increased in recent years, ranging from 16 to 400 per 100,000 of population, varying by geographical location. WAD annual incidence per 100,000 population is estimated to be 100 +, 320 in Sweden, 80 ± 420 in Denmark, Spain and France and as many as 400 in the United States. The annual costs are estimated to be 10 billion euros in...
Only 34% patients affected by WAD have returned to work e23 insurance claim to ESRA Abstracts 12 months, undertook a systematic-meta-review of prog-

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play a role in medico-legal dispute. X-rays may help detect more serious pathology such as fracture and disloca-

of risk factors of serious pathology. Physical examination has a limited role, all

reduce compensation. In retrospective, 10 years analysis, only 6.4 % patients with WAD required hospitalisation.7

Prognostication: Sarrami et al. 1 undertook a systematic-meta-review of prog-

ostic factors in WAD. The predictors of poor outcome leading to chronic pain after whiplash injury are: level of post-injury pain and disability, early use of healthcare resources, post injury anxiety, catastrophizing, and compensation and le-

gal involvement. Factors not associated with chronicity of WAD are MRI and other radiological findings, type of collision, and motor dysfunction. Factors that are controversial or simply there is lack of evidence include: gender, age, education, pain prior the incidence, genetic factors, coping behaviour, general psychological distress and depression.

Clinical Presentation and Pathomechanism of WAD: The clinical presen-
tation varies but usually consists of neck pain, headache and vertigo often associated with memory, attention problems and increased anxiety.

 Few hypothesis and concepts exist to explain the phenomenon of WAD and many factors contribute to clinical picture. The exact pathophysiology is uncer-
tain but attributed to rapid extension followed by flexion and some degree of muscle spasm may produce variety of symptoms due to reach innervation of the neck muscles. Superficial muscles: trapezius, sternoocludemastoid; deeper muscles: splenius, semispinalis, longissimus, scalenes; deepest muscles: multifidis inserted directly to the capsule of facet joints, referred muscles: leva-
tor scapulae, rhomboid major and minor, serratus posterior – any of the above alone or in combination might responsible for clinical manifestation. Figure 1 illustrate posterior neck and upper back muscles.

Although commonly available imaging investigations fail to confirm or refute diagnosis of WAD, the current research shows that brain reacts to whiplash injury with subtle changes in certain regions.

Vallee Garcia et al 5 in recent research shed more light in understanding pathomechanism of chronic WAD. Similarly to concept of brain reorganisation in chronic pain patients descriminated by functional - MRI, referenced study showed significant change of regional cerebral blood flow (r-CBF) in patients with chronic WAD in comparing with healthy volunteers. R-CBF have increased in the right posterior cingulate gyrus,right precuneus and decreased in the right superior temporal gyrus, right parahippocampal gyrus, left inferior frontal gyrus, right dorsomedial thalamus, and in the bilateral insular cortices. Those areas of the brain are related to pain perception and the intergration of nociceptive stimulation. Vallee-Garcia et al. hypothesized disregulation of information from the neck muscles and the vestibular and visual systems, normally integrated in the mesencephalic periaqueductal gray area (PAG) and surrounding regions. Nerves fibres originating in the ventrolateral horn from lamina VI-VII of C1-C3 spinal segments connect with C1-C4 structures. In its turn, the mentioned complex also projects to the PAG, where ascending pathways converge and intensive processes of neumormodulation take place.

Ability to detect the subtle brain changes both using the f-MRI and r-CBF are only the very beginning of our understanding and we are only scratching the surface in our attempts to modulate brain plasticity by education, pharmacotherapy or various nerve blocks and neumormodulation techniques.

Treatment modalities for WAD: What we can offer our patients with WAD? There so no consensus about accurate timing and transition from acute phase, when recovery is very likely, subacute when recovery is still possible and chronic when recovery would be very unlikely. Curatolo classified timing of afore-

mentioned 3 phases by duration of pain: 0-3 months, 3 months – 12 months, and beyond 12 months.10 It would be rather unlikely, at least in the UK, for the pain specialist to see the patient with WAD before 12 months from initial episode. Therefore treatment recommendation differ, depending on the time related to pri-

mary event and specialist physician involved:occupational health, physiotherapy, rehabilitation, orthopedics, neurology, and at last pain specialist. Curatolo re-

viewed in his clinical commentary pharmacoological and interventional treatment available and recommended in treatment of WAD.10

Education and Physical Therapy: The evidence of role of rehabilitation are inconclusive and it is not clear if exercise sessions are more effective than advice alone. Despite of limited data in hierarchy of EBM, education and exercise pro-

gram should be widely offered and encouraged. Multidisciplinary rehabilitation programs have proven beneficial for patients suffering from chronic WAD in 5 years prospective observational studies conducted by Haïduk et al. 4

Pharmacotherapy: NSAID might be justified in an acute phase for both an-

glesic and antiinflammatory properties. Chronic use need to be balanced against the risk of gastrointestinal, renal and cardiovascular complications. Weak opioids (codeine, dicydronide, Tramadol) often in combination with paracetamol are perhaps most commonly used in moderate pain. Prolonged use is not recommended although concerns are not as grave as in case of strong opioids.

Opioids are not recommended in WAD or in any other form of chronic pain, and its risk has been highlighted widely in the recent years; addictions, in-

creased mortality, hormonal effect and immunosepression being the most com-

mon. In the matter of fact chronic pain clinics across UK struggle with burden of, mostly young patients,being on long term opioids for chronic intractable but not life threatening conditions. Opiod reduction clinic or complex pain clinic has been established in many leading centers to face the challenge.

Muscle relaxants – there are no R’s and’s evidence on the use muscle relax-

Ions (benzodiazepines and other antispasticity medication) in WAD, but the risk of central nervous system side effect make them unlikely ally.

Anticonvulsants, chiefly gabapentoids, well established in treatment of neu-

ropathic pain, are not drugs of first choice in WAD and its use has not been sup-

ported by current literature. In individuals with features of central sensitisation and general anxiety, pregabalim might be considered. Worth to remember that the common use of these medications comes not from their efficacy and strong evidence but from the lack of other alternative.

Antidepressants - Noradrenaline and serotamine re-uptake inhibitors influ-

ence mood as well as enhance pain inhibition pathway and might be considered in individual cases of hypervigilance, sleep disturbance and depression.

5% Lignocaine patches, licenced for postherpetic neuralgia, have proven to be useful in various peripheral neuropathies associated with allodynia and hyperalgesia. In patients with WAD and skin hypersensitivity might be worth considering. No data are available to the authors but clinical experience shows that patients rarely continue using the patches if have not found them effective.

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Interventional Treatment: Trigger points injection may have gained different meaning thanks to introducing ultrasound to daily pain practice. Instead of the blank approach to inject trigger points, careful assessment with ultrasound may reveal specific muscle groups or fascial plane to be targeted. Despite of lack of strong evidence most clinician justify use of trigger points in patients with myofascial pain including WAD although there is not detectable evidence of muscle and fascial pathology. Prospective data shows on average at least temporary improvement regardless of technique and injectate. Local anesthetics, saline, water, botulinum toxin A (BTA), steroids, prolotherapy, platelets rich plasma (PRP) – all have been successfully applied. BTA has been generally found to relieve pain and improve range of movement especially if targeted selected muscles: splenius capitis, rectus capitis, semispinalis capitis, trapezius, levator scapulae.

Cervical Medial Branch Block and Radiofrequency Denervation (CMBB RFD): Strongest evidence exist for cervical medial branch radiofrequency denervation. It has been supported by randomised trials and systemic reviews.

Cervical zygapophyseal joints (facets) belong to the group of diathrosis joints, mobility being their distinguishing character. The facet joints are formed by the superior and inferior articular processes at the level of the junction of the lamina and the pedicle of the vertebra below and above respectively. The facet joint is a synovial joint enclosed by a thin, loose ligament known as the facet capsule. The facet capsule also contains Aδ- and C-fibres, both of which transmit nociceptive signals. Substance P and calcitonin gene-related peptide have also been identified in the cervical facet capsules. Facet joints are innervated by the medial branches of the dorsal (posterior) rami of C4 – C8 cervical nerves. The medial branches lie close to the bone and run around the waist of articular pillar innervating facet joint above and below. The exceptions are C3 and C7 MB. Deep branch of C3 takes the typical route around C3 articular pillar and innervates C3-C4 joint. Superficial branch of C3 (known as the third occipital nerve-TON) curves around posterior and lateral to C2-C3 joint innervating it and then sends sensory fibres to suboccipital area. C7 MB crosses superior articular process of C7 which is more cranial and nearer C7 foramen. Various techniques have been described of CMB block and radiofrequency ablation under fluoroscopy guidance in different patient’s positions: supine, lateral, prone which is irrelevant as long as active tip lies in the middle-upper part of articular pillar along median branch, maximizing contact for radiofrequency lesion. Recent anatomical study by Kweon et al. reinforced our anatomical knowledge and highlighted importance of precise needle position for both the best outcome and to minimize complications. The latter are very rare, only described by case reports, but not impossible considering complex and vulnerable anatomical structures surrounding cervical facets. Lately such a case was described by Medical Protection Society (MPS) and Figure 2 shows needle within spinal cord as a result of careless technique with lateral approach. (presented at one of the cadaveric workshop organized by authors (TG, AK, KvT) contact. Finlayson et al. published own experience with in plane needle insertion under ultrasound guidance along the course of MB providing adequate needle contact for radiofrequency denervation (RFD)

For safety, accuracy, precision and time efficiency at St George’s University Hospital Chronic Pain Service, combined fluoroscopy-ultrasound technique has been introduced and widely taught. Since 2012 we performed 274 CMB blocks and 54 CMB RF.

For patient in prone position, fluoroscopy helps to define the desired level and initial needle direction to achieve “tunnel vision” and further progress to the upper middle part of articular pillar (Fig 4 a). Ultrasound helps the final needle position, parallel to the medial branch close to the articular pillar and identify surrounding neurovascular structures such as the vertebral artery, radicular artery and the anterior nerve root before proceeding to perform a thermal lesion and therefore increasing safety as well as precision of the procedure as illustrated in Figure 4 c. The needle position is verified in longitudinal and transverse scan.

FIGURE 3.

Ultrasound and fluoroscopy combined for cervical medial branch radiofrequency denervation.

a) Lateral and A-P view of fluoroscopy images in patient in prone position. Note needle “tunnel vision” in A-P position. Lateral view shows needle position at the level of articular pillar from single entry point

b) Ultrasound probe position in longitudinal and transverse neck scans to assess needle position.

c) Ultrasound images in transverse scan. Needle alongside and close to the articular pillar, parallel to the medial branch.

The best of both worlds”, combination of fluoroscopy and ultrasound helps fast and efficiently identify accurate level with fluoroscopy, without additional scanning in both longitudinal and transverse probe position, cranially and caudally in repetition, to identify seek level each time. Ultrasound eliminates imperfection of fluoroscopy, helping the final adjustment of the needle close to articular pillar and medial branch and reduces the risk of inadvertent vascular and neural damage, boosting the confidence of safety of thermal ablation. To increase efficacy of CMB RFD various modalities has been proposed: needle size, active tip size, duration, temperature, bipolar lesion,multiple lesion;cooled RF, multifaceted needles, fluid preinjection-all showed increase the lesion size. Any combination of the parameters above may result in desirable lesion size, but the safety balance need to be achieved in consideration of targeted neural tissue and neighbour structures such as motor nerves, vessels and other vital organs. Without any doubt more robust data are needed but so far, our data of 328 procedures proved safety, reduced time of the procedure, amount of radiation and increased efficacy.

In summary CMB RF has been so far most effective treatment of chronic WAD and although treatment often needs to be repeated, for the most patients seems to be good enough to come back after 24th months, on average, and request to have the procedure again, accepting the potential risk.

Further research on brain plasticity and subtle changes in rCBF may bring newer ideas of treatment and response modulation. For the time being, in view of limited response to pharmacotherapy, well trained pain physician may offer efficient and safe intervention. However at early phases of WAD no intervention but reassurance, education, exercises and NSAID if appropriate should be main stream management. Resilience by increasing road safety, clear insurance policy and change in litigation culture may have significant and positive impact but will depend on socio-cultural-economic factors. Who did not get a call in the last few years? : “Mister, Mister we heard you have been involved in a car accident recently, sustained whiplash injury and you entitled for compensation...” Hands up!
onset time, longer block duration, less volume of local anesthetic with good spread visualization and visibility of neural structures.\(^1,6\)

The Pediatric Regional Anesthesia Network, in 2012, corroborated the European investigators conclusions by doing the first prospective, observational, multicenter study of the practice of pediatric regional anesthesia and its complications from the United States. They concluded that regional anesthesia in pediatrics is remarkably safe, with a very low rate of complications and no long-term sequelae. They also showed that peripheral nerve blocks were very often performed in infants and children, and that the use of ultrasound guidance was the mainstay practice for many of those blocks.\(^6\)

Peripheral nerve blockade can be performed practically in any region of the body and there has been several review articles that thoroughly and extensively describes them.\(^10,12,13,14,15\)

The most frequently placed blocks in the upper extremity are supraclavicular, infraclavicular and axillary approaches, or blockade of the individual nerves like the ulnar, radial and median nerves.\(^1\)

Owing to the widespread use of caudal epidural blocks, selective nerve blocks of the lower extremity are not predominantly used in children. Still the femoral nerve and sciatic popliteal approach blocks are commonly performed.

The increase widespread of ultrasound guidance regional anesthesia created a whole new field of interest, namely the fascial plane blocks. As so, thoracic and abdominal wall blocks are becoming very popular and the most commonly performed ones in the pediatric setting are the ilioinguinal iliobypogastic and IAP blocks.

Pediatric regional anesthesia will continue to progress as new techniques evolve or interest in established techniques is rekindled or modified for use in children of all ages.\(^1,11,13,17,18,19\)

A supracycromatic block to the maxillary nerve, described for use in clef palate surgery. The erector spinae plane block, an novel technique recently described for thoracic and abdominal surgery that has proved itself quite promising. The quadratus lumborum block and its different approaches, already described in several pediatric abdominal surgeries and whose best approach is yet to be determined. The potential advantageous use of the pudendal nerve block over the caudal block for hypospadias repair due to longer analgesia duration and no apparent evidence of post-surgical complications association.

Currently, only a limited number of regional anesthesia techniques for a restricted number of surgical procedures have demonstrated significant improvements on post-operative pain outcomes. Nonetheless, very few studies demonstrated lack of benefit when the decision to perform the technique was made.\(^9\)

In conclusion, worldwide pediatric regional anesthesia is in constant evolution, forms a part of the anesthetic culture and is almost an expectation for children presenting for surgery.\(^19\)

Training in ultrasound-guided nerve blocks is yet to be fully standardized, even though efforts are being made, particularly in adult setting.\(^19,20\)

It's true that in order to master a technique you need to perform it several times, enhancing your probe to needle coordination as well as structure visualization. But identifying that "bright dot" or that reference landmark might only come with a small percentage of your final mastery. The truth is that first you need to learn about applied anatomy and then applied sonanatomy, that evolves as the child grows. At the same time you need to focus on several different aspects regarding equipment, ergonomy, assepsy, the patient itself and the block approach. Just to state a few.

Performing regional pediatric anesthesia is not a secondary skill anymore (if it ever was considered that way), it's a must-have complete thought process, integrated in your anesthetic plan that you need to master with the same excellence as any other subspeciality, in order to promote a perioperatively superior analgesia and an overall patient/parent satisfaction.

References:

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### TABLE 1. Postoperative Neurologic Syndrome

<table>
<thead>
<tr>
<th>Reference</th>
<th>Incidence</th>
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<tbody>
<tr>
<td>ADARPEF Ecoffey et al (2010)</td>
<td>0.17/1000 (NS)</td>
</tr>
<tr>
<td>PRAN Tannzer et al (2014)</td>
<td>1.31/1000 (US) &gt; 6 months 0.019/1000</td>
</tr>
<tr>
<td>Sites et al (adults) (2012)**</td>
<td>0.19/1000 (NS)</td>
</tr>
<tr>
<td>Ecoffey et al (axillary block, adults) (2014)***</td>
<td>1.8/1000 (US)</td>
</tr>
<tr>
<td>Ecoffey et al (axillary block, adults) (2014)***</td>
<td>&gt; 6 months 0.07/1000 (US)</td>
</tr>
</tbody>
</table>

NS = Nerve Stimulation, US = Ultrasoundography

** Sites et al Reg Anesth Pain Med. 2012

*** Ecoffey C et al Eur J Anaesth 2014

### TABLE 2. Local Anesthetic Systemic Toxicity and Peripherale Blocks.

<table>
<thead>
<tr>
<th>Reference</th>
<th>Incidence</th>
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<tbody>
<tr>
<td>ADARPEF Ecoffey et al (2010)</td>
<td>0.03/1000 (NS)</td>
</tr>
<tr>
<td>PRAN Tannzer et al (2014)</td>
<td>0.09/1000 (US)</td>
</tr>
<tr>
<td>Sites et al (adults, seizure) (2012)*</td>
<td>0.08/1000 (US)</td>
</tr>
<tr>
<td>Ecoffey et al (axillary block, adults) (2014)**</td>
<td>0.15/1000 (US)</td>
</tr>
</tbody>
</table>

NS = Nerve Stimulation, US = Ultrasoundography


** Ecoffey C et al Eur J Anaesth 2014

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REFRESHER COURSE 3: PERSISTENT POST-SURGICAL PAIN: STILL A LONG WAY TO GO

ESRA7-0483

PERSISTENT POST-SURGICAL PAIN: STILL A LONG WAY TO GO

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More than 45 million surgical procedures are performed in the United States annually. It has been estimated that acute postoperative pain will develop into persistent chronic postoperative pain (CPSP) in 10% to 50% of individuals after common operations. Since chronic pain can be severe in up to 10% of these patients, CPSP represents a major clinical problem—affecting at least half a million patients yearly. It is thus imperative to understand the mechanisms, identify possible risk factors, and establish preventive strategies.

Chronic postoperative pain (CPSP) is defined as a persistent pain state, lasting more than 2 months postoperatively, that cannot be explained by other causes, such as disease recurrence, apparent inflammation, or other nonsurgical related factors. The pain differs in quality and location from pain experienced prior to surgery, and is usually associated with irritable neuropathic pain, caused by surgical injury to a major peripheral nerve. Although all types of surgery can potentially lead to CPSP, some operations are at higher risk of causing nerve damage, such as inguinal hernia repair, breast and thoracic surgery, leg amputation, and coronary artery bypass surgery. Consequently, surgical techniques that avoid nerve damage should be applied whenever possible. CPSP is thought to be caused by surgical nerve injury, but the fact that an identifiable nerve injury can be found in only 1/3 of CPSP patients suggests that the problem may be far more complex.

Pathophysiology and Pathogenetic Mechanisms: Surgery, by nature, involves the cutting of tissues and nerves, which induces the injury response (inflammation and angiogenesis) and alterations of peripheral (PNS) and central nervous system (CNS) pain processing (central sensitization), which can lead to chronic pain. After peripheral nerve injury, increased sodium–channel (Na+) expression on sensitized primary afferent nerves leads to spontaneous activity, with increased glutamate release from the nerve endings. Consequently, it acts on glutamate receptors (NMDA, AMPA, kainate, and mGluRs), thereby triggering intracellular changes. These changes contribute to sustained central sensitization, with increased spontaneous impulse discharges, reduced thresholds, increased response to peripheral stimuli, and expanded receptive fields of central neurons.

Central sensitization is an amplification of pain signaling in the spinal cord from repeated stimulation from the periphery. Surgery increases synaptic activity in dorsal horn neurons. Humoral signals released from inflamed tissue act on the CNS and intracellular kinases. Within hours, altered gene transcription in the dorsal root ganglion (DRG) of sensory neurons and the spinal cord augment release of excitatory transmitters and reduce inhibitory transmitters. This results in neuronal excitability lasting days. When the noxious stimuli continue, then neuropaesthetic transformations occur and a positive feedback loop forms. Over time, neurons change structure, function, or chemical profile leading to pain as a disease.

Risk Factors: A number of putative perioperative risk factors have been identified, helping to isolate likely candidates, but instituting preventative measures and identifying a treatable source of pain continues to be elusive. Genetic susceptibility is likely to play a role. A positive correlation between sensory abnormalities and genetic tests that neuropathic mechanisms are responsible in a majority of pain cases. This increase in awareness of CPSP has led to a huge body of research looking into pre-emptive and preventive strategies. The challenge is to accurately identify at-risk patients and target suitable interventions.

Genetics: Patients differ in their response to pain and analgesics partly due to genetics. For example, COMT polymorphism is associated with the risk of developing chronic temporomandibular joint pain. Melanocortin 1 receptor gene in red headed/fair skinned persons confers greater female specific kappa- and opioid receptor analgesia. Patients with complex regional pain syndrome have a high frequency of human leucocyte antigen (HLA)-DQ1 gene. Genetic polymorphism of GTP cyclohydrolase (rate-limiting enzyme for BH4 synthesis and key modulator of perineural neuropathic pain and inflammatory pain) is associated with less pain following discoscopy.

Psychosocial Factors: Pain is the result of the interaction between biological and psychological variables. Preoperative anxiety and pain are correlated with the development of more postoperative pain. For example, catastrophizing in limb amputees contributes to phantom limb pain.

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Preventive Analgesia: The concept of preemptive analgesia is to initiate an analgesic regimen before the onset of the noxious stimuli (in the case of surgery, the incision) to prevent the development of central sensitization and limit subsequent pain experience. Whether preemptive analgesic interventions are more effective than conventional regimens remains controversial.

Interventions at one or more sites along the pain pathway are recommended to be performed prior to incision. These include infiltration of the incision site with local anesthetics (bupivacaine, lidocaine), performance of central or peripheral regional anaesthesia techniques, as well as initiating medications (NSAIDS, NMDA receptor antagonists, gabapentinoids, α2 agonists, opioids).

One retrospective review compared preoperative analgesic interventions with similar postoperative analgesic interventions. The researchers retrospectively looked at 66 studies involving 3,261 patients using five types of analgesic interventions: epidural analgesia, local anesthetic wound infiltration, systemic NMDA receptor antagonists, systemic NSAIDS, and systemic opioids. The researchers found that preemptive administration of epidural analgesia, local anesthetic wound infiltration, and NSAIDS were most effective at reducing the need for postoperative analgesic. Whereas preemptive epidural analgesia resulted in consistent improvements in all three outcome variables, preemptive local anesthetic wound infiltration and NSAIDS administration improved analgesic consumption and time to first rescue analgesic request, but not postoperative pain scores. Less proof of efficacy was found in the case of systemic NMDA antagonist and opioid administration and the results remain equivocal.

Preventive Analgesia: Preventive analgesia is considered a more complete intervention than preemptive analgesia. It includes pre-, intra-, and postoperative techniques. There is less focus on the timing of the intervention, with more emphasis on prevention of pathologic pain. Both can reduce postoperative pain of a long-term duration.

There is increasing evidence that the efficacy of analgesic agents differs between surgical procedures. Therefore, postoperative pain management protocols must be optimized by examining procedure-specific outcomes. Surgery-specific nerve blocks—performed pre-, intra-, and postoperatively—and continuous peripheral nerve blocks provide excellent analgesia, safety, opioid-sparing, and improved rehabilitation.

As noted, strategic preoperative delivery of oral or intravenous medications can significantly improve postoperative pain. These agents include NSAIDS, and...
Challenges:
and postoperative pain and good surgical techniques are provided: 1) aggressively optimize analgesia in the acute injury and pre-operative phase with extension into the post-operative/healing period 2) screen patients for the presence of major depression and other psychiatric conditions with aggressive treatment concomitant to analgesic strategies and 3) identify patients who have modifiable risk factors for the development of chronic pain and manage accordingly and 4) identify patients who have suboptimal responses during acute and subacute phases of treatment that are likely to develop chronic pain, so that comprehensive and interdisciplinary pain management can be initiated.

While a paucity of evidence–based strategies remains, many areas for future research are highlighted. The challenges we face when treating acute and chronic pain may not only be an issue of what we use to treat, but rather how and when we implement such treatments. Many basic questions remain: 1) When does central sensitization begin following tissue injury? 2) How do we detect the onset of central sensitization 3) Are treatments provided too late in the disease course after central sensitization has already occurred? 4) Are currently available treatments ineffective or lacking potency despite early aggressive treatment as with preemptive, primary and secondary prevention? 5) Should treatments be maintained for long periods of time, extending beyond initial nervous tissue injury? Further prospective studies are warranted to address these important questions.

Conclusion: CPSP is a significant problem that reduces the quality of life of patients. Despite improved understanding of the process, interpretation of pain signals, and the development of new analgesic techniques, undertreatment of postoperative pain continues to be a problem. Therefore, it is now recognized that aggressive perioperative interventions can reduce the intensity of acute postoperative pain, which reduces the risk of a patient developing CPSP. Genetics may also play a role. Genetic factors have been studied, since only a proportion of patients with intraoperative nerve damage develop chronic pain after surgery. In addition, research is also suggesting that a patient’s emotional state can influence the risk of developing CPSP. Based on these all factors, it now seems appropriate to apply a multimodal protective analgesic approach to prevent chronic postoperative pain.

It is important to identify patients at risk of developing this syndrome. Iatrogenic neuropathic pain is a common cause, and treatment should be targeted at the progression of mechanisms leading to neuro–degeneration. Improving the management of acute intra- and postoperative pain and good surgical techniques are some helpful strategies. Furthermore, we need to educate patients wanting surgery for reasons other than illness or disability of the risk of the development of CPSP.


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CSE FOR LABOR AND CESAREAN SECTION: WHY AND HOW?

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CSE FOR LABOR AND CESAREAN SECTION: WHY AND HOW?

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Abstract: During the last 60 years, the evolution of epidural analgesia for labor pain relief has resulted in effective maternal analgesia, with an ever improving safety profile, reduced side effects and tailor-made delivery modes which optimize patient satisfaction. If epidural catheter placement is preceded by a spinal dose of analgesia, as is the case in a Combined Spinal Epidural technique (CSE), a faster onset of a more profound analgesia is observed with a minimal motor block. The appearance of CSF in the spinal needle provides additional identification of the epidural space and results in lower epidural catheter failure rates, as different studies have demonstrated.

Even as the benefits of CSE in labor analgesia seem obvious, some controversies surrounding the original technique have initially hampered full spread adoption of CSE as the technique of choice for labor analgesia. But over the years, both severity and incidence of hemodynamic instability, occurrence of fetal bradycardia and opioid side effects have been minimized with improvements of the technique.(2,3) Concerns over delayed recognition of epidural catheter failure and catheter reliability have been proven unfounded: the collected evidence seems to tip the balance even further in favor of CSE.(4)

But the latest modification of the technique, the Dural Puncture Epidural (DPE), may prove to be the real competitor to CSE: it combines the advantages of CSE, by bypassing its presumed disadvantages.(5) As in CSE, the dura will be perforated with a 25 G or 27 G spinal needle, which will confirm the position of the epidural needle. The difference is that no drugs will be administered intrathecal before epidural catheter advancement. This takes away any objection to using an epidural test dose and prevents development of fetal or maternal side effects of intrathecal drug injection.(6)

Future studies will have to demonstrate the true value of DPE: in the meantime, compared to epidural labor analgesia, CSE provides improved first-stage analgesia with less need for epidural top-ups.(7)

US GUIDED LUMBAR PLEXUS BLOCKS: WHAT IS THE BEST APPROACH BASED ON SURGICAL INTERVENTION AND PATIENT CHARACTERISTICS?

ESRA7-0513

US GUIDED LUMBAR PLEXUS BLOCKS: WHAT IS THE BEST APPROACH BASED ON SURGICAL INTERVENTION AND PATIENT CHARACTERISTICS?

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The lumbar plexus is formed by the union of the anterior primary rami of L1, L2, and L3 and the greater part of L4 within the psoas muscle. The plexus can be blocked from posterior or anterior. The posterior lumbar plexus block (PLPB) allows for complete blockade of the lumbar plexus with only one injection. For the same blockade quality, the anterior access requires the blockade of three nerves: the femoral nerve (FN), the obturator (ONB) and the lateral femoral cutaneous nerve (LFCNB).

The lumbar plexus block provides anaesthesia for hip fracture repair and minor/major thigh/knee procedures as well as postoperative analgesia for patients undergoing major knee and hip surgery. When combined with a sciatic block, the technique provides complete unilateral lower extremity anaesthesia.
PLPB has been described since the early 1970s and it is traditionally performed using surface anatomical landmarks and peripheral nerve stimulation (1, 2, 3). The block was not very widely used since a publication in 2002 of a large study from France raised concerns over the safety of PLPB as the incidence of serious complication was calculated as 80 per 10,000 compared to an incidence of 1 per 500,000 for local anesthetics (4). However, with appropriate skills and training it remains a useful and safe technique for regional anaesthesiologists (5, 6).

Unlike the FNB, ONB and LFCNB, which involve very few risks, side effects related to posterior lumbar plexus block are quite severe. Life-threatening haemorrhagic complications have been described after PLPB with or without catheter insertion (4). As a result, international regional anaesthesia societies recommend applying the same guidelines for PLPB as for neural axial blocks in patients given anticoagulant or antplatelet therapy (7, 8). Intoxication with local anaesthetics after unintended intravascular injection has also been described. Adverse intravascular injection of local anaesthetic is based on the high vascularity of the lumbar paravertebral region. Other serious side effects include cardiac arrest from respiratory depression, cardiac failure, and sympathetic block leading to hypotension and cardiovascular collapse (9).

Despite the recent popularity of ultrasound guidance in regional anaesthesia, there has been limited interest in utilizing ultrasound for lumbar plexus blockade. This is likely due to the deep nature of the block and the increasing number of obese patients. In normal-weight patients the lumbar plexus is located at a depth of 7-8 cm and even deeper in patients with high BMI, therefore consequently not easy to identify with ultrasound (US). For deeper blocks such as the PLPB low frequency US (5-10 MHz) and curved array transducers are necessary for adequate beam penetration in most adult subjects to image the lumbar paravertebral anatomy. In addition, an increased echo intensity of skeletal muscles in the elderly and the fat mass in the obese can make US imaging of the lumbar paravertebral anatomy and US guidance of the PLPB difficult. Direct ultrasound imaging of the lumbar plexus has only been routinely feasible in paediatric patients (10). Therefore, in adults the use of nerve stimulation in addition to US imaging is strongly recommended to correct the needle placement in order to increase the success rate and reduce complications (11).

Improvements in US technology and the development of new high-quality US machines made the lumbar plexus block interesting for US guidance. The relevant sonography of the lumbar paravertebral region was first described by Kirchmair and colleagues (12). In recent years, mainly three different US-guided techniques of PLPB have been reported.

1. Paramedian sagittal approach (Trident), described by Karmakar 2008 (13)
2. Paramedian transvers approach, described by Karmakar 2013 (14)
3. Subcostal approach (Shamrock), described by Sauter 2013 (15)

All three techniques are performed with the patient in the lateral decubitus position, with the side to be blocked uppermost.

For the paramedian sagittal approach the US transducer is positioned sagittally over the transverse processes of the L3, L4, and L5 vertebrae producing the typical “trident sign”. The psoas muscle is visualized through the acoustic window of the transverse processes expecting the lumbar plexus in the first third of the psoas muscle. Obtaining the trident sign seems easy but limitations of this technique include inadequate sonographic visibility of the surrounding structures, the needle tip, and the perineural spread of local anaesthetic (13). For the paramedian transverse approach the US transducer is positioned laterally to the midline along the intercostal line and just above the iliac crest. This technique requires precise knowledge of the bony structures of vertebral bodies, transverse process and lamina. In a prospective case series this technique was successful in 14 of 15 normal-weight patients undergoing orthopaedic lower-extremity surgery using 20 ml of 0.5% ropivacaine (16). Due to the close proximity of many bony structures the acquisition and interpretation of ultrasound images of the lumbar paravertebral region with this technique can be challenging and seems most demanding.

Placing the US transducer transversally in the flank below the lower costal margin and just above the iliac crest describes the “Shamrock” approach. The transverse process of vertebra L4 and the quadratus lumbarum, erector spinae, and psoas major muscles are identified as a shankrock or three-leafed clover (15). The advantages of this approach are that the US-imaging of the target structures is simple and the insertion point of the needle is nearly identical with the landmark guidance techniques of the past. The main use of the shamrock technique in children aged 1-6 years for postoperative analgesia after hip surgery as well as a dose-finding study with an ED95 of 25.8 ml of ropivacaine for a sensory blockade (17, 18). A recently published randomized controlled trial in volunteers showed that the shamrock LPB was faster, more comfortable, and equally effective with trident LPB (19).

An objective ranking which is the best of the three LPB techniques, Trident, shamrock or paramedian sagittal approach, is difficult and not possible for several reasons. The choice for one or the other approach depends very much on personal preference. Sure is that all three blocks are advanced-skill-level block and should be performed only with the appropriate level of training and skill. Visualization of the whole plexus in the psoas muscle is only if at all possible in children and normal-weight adults. It is therefore prudent to use nerve stimulation in conjunction with US (dual guidance) for all US-guided PLPB in obese patients.

Overall, the data in the literature on the US-guided LPB are sparse. They are mainly related to volunteer studies and normal-weight patients. There is no study on the use of US-guided PLPB in overweight patients, which is the usual clientele in a hospital. Nevertheless, US-guidance in combination with nerve stimulation have resulted in LPBs now being performed more frequently and safely.

The personal experience of many colleagues with all three US-guided techniques clearly favours the shamrock LPB. This technique makes the visualization of the target structures, psoas muscle and transverse process, the needle guidance in real time, the determination of the depth for needle insertion as well as the scanning of the local anaesthetic even in obese patients easy. The puncture of the kidney reported under the landmark and nerve stimulation technique can be avoided and a previous spinal surgery is no longer a contraindication for this technique.

References

Regional Anaesthesia in Children: Surveys, Research and Safety

ESRA7-0495

Regional Anaesthesia in Children: Surveys, Research and Safety

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Pediatric regional anesthesia has attained wide use internationally because of its effectiveness, ease of use, and reduced complications. The current database suggests that, as in the previous studies from Europe, the complication rate is very low (4, 5). Epidemiology of practice

Association Des Anesthesistes-Réanimateurs Pédiatres d’Expression Francophone (ADARPEF) studies and Pediatric Regional Anesthesia Network (PRAN) database have shown the epidemiology of the different techniques, and the evolution during the two last decades. In Europe from the 90’s to the 00’s, we observe a decrease in the neuraxial blocks, mainly less caudal blocks. Truncal blocks trend to replace caudal blocks, particularly in children (2, 6). At the opposite the number of caudal blocks seems higher in US practice (40% versus 19% in Europe and 9% in France (7). However, for orthopedics limbs surgery, the use of peripheral blocks increase in Europe (2) and US (8).

On the other hand, the best available studies, performed in Europe, are more than a decade old. Thus they may not reflect modern practice, including the use of ultrasound guidance. Indeed, this is a big change in our practice during the last decade. Ultrasound was used in more than 80 percent of upper-limb blocks and nearly 70 percent of lower-limb blocks (4). Stronger evidence from the literature suggests that ultrasound-guided peripheral blocks decrease block performance time when compared with nerve stimulation (but take longer than the landmark technique), increase block success, and increase block quality (as measured by analgesic consumption, block duration, and pain scores). Ultrasound guidance in neuraxial blocks improves needling time, predicts epidural depth, allows visualization of the catheter and local anesthetic spread, and improves block quality.

General anesthesia is necessary in most children for the regional block to be performed easily, safely, and effectively. Indeed, placement of regional blocks of all types under general anesthesia is considered the standard of care in pediatrics (9). No difference in local anesthetic systemic toxicity and postoperative neurologic symptoms could be identified but placing blocks in awake or lightly sedated children (10), even with a special focus on interscalene block in children (11). A common logical argument is that there is less risk of injury when placing a needle in an immobile child than in one who is struggling or might move unpredictably.

In addition, we have some surveys with a questionnaire to look at some aspects of practice: choice of local anesthetics and adjuvants following caudal blocks (12, 13), type of loss of resistance technique to identify the epidural space (14).

Epidemiology of complications

For single-injection procedures, the most common complication was inability to place the block or block failure—two percent of total blocks (4). Continuous block procedures had a higher complication rate—most commonly problems in catheter placement (such as kinking or dislodgement). In this group, the block failure rate was nine percent (15, 16).

Real complications were rare and similar in both ADARPEF’s studies (1, 2).

As reported in the literature, they were more frequent (four times in the recent ADARPEF study) in children aged < 6 months that in children aged > 6 months. Neuraxial regional anesthesia has the highest incidence of complications (six times higher that peripheral). Moreover, their incidence remained low despite an increase in use in the last 12 years.

Complications have not reached extreme severity, despite results from a UK audit (5 years, 10,633 epidurals performed) reporting permanent residual neurologic deficit in a child aged 3-month (1-year follow-up), two epidural abscesses, one case of puncture, headache requiring the blood patching, and one drug error resulting in cauda equina syndrome (3). The UK audit also reported five cases of severe neuropathy/radiculopathy resolving over a period of 4–10 months using pharmacological therapy in a Pain Clinic. The recent ADARPEF study records a very low overall morbidity for peripheral blocks; almost six times lower than that in central regional anesthesia. Despite two colonic punctures, it should encourage anaesthesiologists to use peripheral rather than neuraxial (including caudal) blocks as often as possible when appropriate.

The use of catheters does not seem to increase the occurrence of complications, even if cardiac toxicity following a secondary injection through a catheter was attributed to an inadvertent displacement of the catheter. Some complications (at least drug error, wrong side, lower limbs rising resulting in extended spinal blockade) were avoided in the recent ADARPEF study.

Neuraxial regional anesthetic toxicity resulted in one case of convulsions while the UK audit reported only two respiratory arrests and one seizure following central regional anesthesia. They did not require treatment with Intralipid® as reported in a child (17). Some other complications (such as extended spinal anesthetics in two extremities) were reported by a recent survey of extensive data and surveys from international literature. Randomized controlled trials and well-designed prospective observational studies have replaced case series; then, multicenter collaborative networks collected detailed prospective data for research and quality improvement.

Large database studies support safety of regional anesthesia for children undergoing surgery (1, 2, 3). The recent US analysis of an extensive, high-quality database suggests that, as in the previous studies from Europe, the complication rate is very low (4, 5).

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REFRESHER COURSE 11: PHARMACOLOGY OF LOCAL ANAESTHETICS REVISITED!

ESRA7-0468

PHARMACOLOGY OF LOCAL ANAESTHETICS REVISITED!

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In 1633, Bernabé Cobo made a detailed description of the analgesic effect of cocaine, the first local anaesthetic (LA). On September 11, 1884 Karl Koller was the first physician to use cocaine for local anaesthesia during eye surgery [1]. LA molecules consist of three structural components. Aromatic group with hydrocarbon chain is a lipophilic part and determines the potency of LA, as more lipophilic molecule more easily penetrates into the axoplasm. Tertiary amine group, which is hydrophilic, determines the speed of onset by the number of molecules ready to penetrate the membrane of the axon. The intermediate bond which determines the metabolism of LA and the type of LA, is either amineamine or aminooether [2].

The main target of LA is voltage gated sodium channel (VGSC). There are at least 10 subtypes of VGSC and four of them are expressed in peripheral neuronal tissue. Typical VGSC consists of a subunit and three auxiliary β subunits [3]. The sodium conducting part of the channel is a-subunit, which consists of four domains DI – DIV, each domain consists of six transmembrane segments S1-S6. Extracellular loops connecting S5 and S6 segments form selectivity filter, which allows sodium ions to pass the channel. S4 segment represents the voltage sensor, as it has a lot of positively charged arginine and lysine residues. The intracellular link between DIII and DIV, called IFM region, functions as a "lid" and closes the channel from inner side during fast inactivation [3]. The LA binding site is located at 60% depth and at the S6 segment. The residues 1764 (phenylalanine) and 1771 (tyrosine) are hydrophobic aromatic residues separated by two turns on the same face of the protein helix of the pore-forming S6. These amino acids are about 11 Å apart, and most effective LA are 10-15 Å in length [3]. LAs have a positively charged moieties at both end of the molecules and bind to the residues. The residue 1760 (isoleucine) is bulky and protects the inner pore from the extracellular molecules and decrease the speed of LA escape from the binding site [3].

How LAs reach the binding site? There are three possible ways. The main “hydrophilic” way, where LA molecules traverse the cell membrane and then access the binding site of the inner pore during activation, so called use-dependent block [4]. The “hydrophobic” way is from the cell membrane through the lateral fenestrations of the channel [3]. The alternative “hydrophilic” way is for the permanently charged LA through the activation transient receptor potential vanilloid (TRPV-1) channel allowing access for such molecules into the cell [5].

Only non-ionized molecules can readily traverse the axon membrane and therefore, the pH of the extracellular fluid, where LA is administered, is important for the speed of onset. LAs are weak bases and their pKa is higher than target tissue pH. Lidocaine has pKa 7.9 and bupivacaine 8.1, which means that at the normal pH the non-ionized fraction will be 25% and 15%, respectively [2]. In nociceptive environ where the number of molecules available to traverse the membrane decreases with increasing difference between pH and pKa. This difference is one of the three reasons why LAs do not exert their effect in inflamed, lower pH, tissue. The other two reasons are more excitable neurone endings in inflamed tissue and increased absorption from the injection site due to high vascularity of the inflamed region [4].
Slow release formulations of LA are trying to concur the market for more than two decades. So far, liposomal bupivacaine has FDA approval for local infiltration only [6]. Liposomes used in bupivacaine formulation are multivesicular, they consist of multiple lipid layers of different sizes and nonconcentric shape [6]. Local infiltration of liposomal bupivacaine has been compared to placebo in different surgical procedures and has shown to The concentration of liposomal bupivacaine against plain bupivacaine HCl has shown conflicting results, majority of the recent meta-analyses showing no difference [7, 8] or slightly better results for liposomal bupivacaine [9]. Perineural injection of liposomal bupivacaine has also been studied, but recent review by Cochrane group could not perform any meta-analysis because of the lack of evidence [10]. The current evidence is uncertain and does not support using expensive liposomal bupivacaine instead of plain bupivacaine or alternatives.

The systemic use of local anaesthetics, mostly lidocaine, is gaining popularity. Weibel et al. published extensive systematic review of the studies on intravenous administration of lidocaine. The main findings of this review were the reduction of pain, reduced consumption of postoperative opioids and reduction of the incidence of nausea and vomiting in [11]. The review suggests that there were no beneficial effects during open abdominal surgery, but less extensive. The gastrointestinal recovery was also hastened by intravenous lidocaine usage [11]. The relative risk RR of postoperative ileus in the lidocaine group was 0.38 compared to placebo [11]. The possible mechanisms can include interactions with the immune, anti-inflammatory effect and interactions with the endogenous opioid system [4].

Effects of LAs on cancer progression and recurrence is another fascinating topic. Is it a myth? LAs can influence cancer cells directly and indirectly through possible effects of locoregional anesthesia. Direct effects include (a) inhibition of TNF-α-induced Stc-activation and intercellular adhesion molecule-1 phosphorylation, (b) inhibition of the epidermal growth factor receptor pathway, (c) antiproliferation of mesenchymal stem cells, (d) blockade of the α-subunit of VGSC, (e) induction of apoptosis in cancer cells, (f) demethylating properties. All these effects are tested in vitro and clinically relevant effects await studies for confirmation [12]. Indirect effects include reduction of the surgically mediated neurogenic stress response via better preservation of NK cell activity, an increase in antiinflammatory cytokines interleukin-2 and interleukin-10 and lower percentage of circulating regulatory T cells and Th2 cells as well as reduced C-reactive protein levels after surgery, thereby potentially improving the host’s immune function against tumour cells [12]. A lot of different studies have been published in last 20 years on this topic. Despite strong theoretical support for the idea that regional anaesthesia can positively affect patient outcome after cancer surgery, the actual benefits in practice have not been definitively shown.

LA toxicity can be roughly divided into two groups: allergic reactions and systemic toxicity. Procaaine can trigger allergic reactions via its metabolite known as para- amino benzoic acid (PABA). The chemical structure of the latter contains phenyl ring with amine substitution and is known to be immunogenic [2]. However, anaphylactic reactions to amide LAs are very rare. Kvissegard et al. published the data from Danish Anaesthesia Allergy Centre were they investigated 409 patients with suspected allergic reactions to amide LAs and found none really associated with them. The authors estimated that in this period ca 1.6 mln of Danish people were exposed to LAs, which makes allergic reactions to amide LAs exceptionally rare event in the northern Europe [13].

Is local anaesthetic systemic toxicity (LAST) an increasing trend or a publication bias? LAST can occur after an inadvertent intravascular injection or absorption from the site of injection. In 2010, Di Gregorio and co-authors published a well-known review describing 93 cases of LAST in 50 years time [14]. Vasques and co-authors analyzed 58 cases published from 2010 to 2014 and found 67 cases of LAST in this period [15], to speculate that it is more than 5-fold increase. The pattern of LAST is also changing. In 2010 analysis, 50 % of cases had an immediate (less than 1 minute) onset and other 25% of cases had onset within the first 5 minutes, suggesting inadvertent intravascular administration [14]. On a contrary, a review of single shot ultrasound (US) guided blocks published in 2015 have shown that in 73% of the cases LAST occurred after 10 minutes. In single shot blocks performed with a nerve stimulator, 20 % of LAST had onset between the 5th and the 10th minutes and in 40% of cases later than 10 minutes [15]. These data suggest the increasing role of absorption mechanism. The spectrum of drugs has also changed. Ropivacaine overtook the bupivacaine [14, 15]. Local anaesthesia is very popular technique amongst different specialties and this has also reflected in LAST case reports, as 35% of cases did not involve anaesthesiologists at all. It is very worrying that 12 % of the cases had happened in the office and 4% at other locations including patients’ home [15]. This clearly indicates the need for additional education and training, as local anaesthesia can be dangerous for the patients. The simple precautions that may save lives: visualise, use safer drugs, minimise dosage, aspirate, avoid rushing through and observe the patient. In an unfortunate rare event of toxicity, be prepared to provide airway management, seizure control and resuscitation with lipid emulsion and a lower dose of epinephrine up to 1 µg/kg [16].

In conclusion, LAs are the drugs mainly influencing the nerve conduction by blocking VGSC and producing locoregional anaesthesia. Recently, some “non-local” effects were also discovered and studied, these include the effects on gastrointestinal recovery and cancer cells. The popularity of LAs and locoregional technique may lead to an increased incidence of LAST. The need for continuous education in the field of LAST must not be overlooked.

References
The classical approach for interscalene brachial plexus block implies to position the needle tip within the plexus between C5 and C6. Unfortunately, this approach is associated with a high risk of nerve puncture as demonstrated in a cadaver study [1]. Indeed, Orebaugh and colleagues revealed that a needle tip positioned between two hypocycloidal nodules without evidence of intraneural injection during visualization of an ink solution might result in a nerve puncture in 50% of the cases when sections are examined under the microscope [1]. Concerned about these results, some authors explored a novel concept and positioned the needle tip at a variable distance from the brachial plexus within the middle scalene muscle and demonstrated that an extraneural injection even at a distance of 10 mm might result in a successful block [2]. Further investigations showed that an extraneural injection reduces rate of hemidiaphragmatic paralysis by 70% while providing similar analgesia when compared to an intraneural injection, for both single-shot injections [3] and continuous infusion [4].

The ultrasound approach for supraclavicular, infraclavicular and axillary brachial plexus blocks is different. While a multiple-injection compared to a single-injection technique reduce onset times and increase success rates when peripheral nerve stimulation is employed [5–7], the situation might be dissimilar with ultrasound as it permits visualisation of the needle tip and spread of local anaesthetic. Based on 19 randomised controlled trials and more than 1600 patients, a recent meta-analysis demonstrated that the supraclavicular, infraclavicular, axillary approaches have equivalent block success rates [8]. Irrespective of approach, a single-injection technique is as effective as a multiple-injection technique but with reduced needling time and fewer episodes of paraesthesia. This is of paramount importance as rapid procedure time and high success rate are critical to efficient care in a busy operating theatre. Interestingly, the overall ultrasound-guided success rate was 92% in this meta-analysis with volumes ranging from 20 to 35 ml whereas earlier systematic reviews reported a 76% block success rate for NON ultrasound-guided brachial plexus blocks [7] with volumes between 40 and 50 ml. Taken together, these findings support previous conclusions that increased success with ultrasound guidance [9, 10] may be possible despite a concurrent reduction of local anaesthetics dose [11].

In conclusion, a single injection for brachial plexus block, if appropriately located, provides adequate diffusion of local anaesthetics within the brachial plexus sheath and around the terminal nerves, resulting in a satisfactory block, while reducing the risk of nerve injury.

References

REFRESHER COURSE 17: ADJUNCTS TO LOCAL ANAESTHETICS: AN UPDATE

ADJUNCTS TO LOCAL ANAESTHETICS: AN UPDATE
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Orthopaedic surgery produces moderate to severe postoperative pain but regional neural blockade with local anaesthetic can provide effective analgesia for a broad range of surgical procedures. Interventions that increase the duration of local anaesthetic action may permit a prolongation of postoperative patient comfort. Indwelling, perineural catheters have been employed to extend the duration of analgesia, but these techniques are associated with frequent complications such as catheter migration, anaesthetic leakag or pump malfunction and require complex logistic organization, especially when surgery is performed in an ambulatory setting. Several adjuncts, including opioids, tramadol, clonidine and neostigmine, have been tested with single-shot regional techniques, but failed to achieve desired expectations. In the last decade, two molecules have gained interest in regional anaesthesia, dexamethasone and dexmedetomidine. Dexamethasone, a high-potency, long-acting glucocorticoid with little mineralocorticoid effect, has been shown to prolong peripheral nerve blockade in animals [11] and to extend the duration of analgesia in humans [10] when added to bupivacaine microspheres. Although incompletely understood, the mechanism of action is hypothesized to stem from decreased nociceptive C-fibre activity via a direct dexamethasone effect on glucocorticoid receptors and inhibitory potassium channels. Other authors suggest a local vasoconstrictive effect resulting in reduced local anaesthetic absorption or a systemic anti-inflammatory effect following vascular uptake of the drug. Perineural dexamethasone was first explored clinically more than 12 years ago, followed by a myriad of clinical trials. Recently, a meta-analysis concluded that perineural dexamethasone prolonged the duration of analgesia by more than 8 hours, when combined with long acting local anaesthetics, suggesting that patients could benefit from a pain-free postoperative night.
Of note, ropivacaine, but not bupivacaine, combined with dexamethasone may result in crystallisation in vitro studies, due to the elevated pH of dexamethasone and the incompatibility of ropivacaine with alkaline solutions.19 In addition, perineural dexamethasone remains an off-label route of administration, and intravenous (IV) dexamethasone at doses between 0.1 to 0.2 mg/kg offers the potential for systemic anti-inflammatory and analgesic effects.21,22 Indeed, Deporter and colleagues explored both routes of administration in a randomized controlled trial and concluded to equivalent prolongation of analgesia.23 That conclusion could obviate the need for peripheral administration. Dexmedetomidine, an alpha-2-agonist, might be a safe and effective adjunct to local anaesthetics, as demonstrated in animal studies.23,24 The mechanism of action stems from hindering normal activity during the refractory phase in an action potential. However, despite early promising evidence from animals, recent meta-analyses concluded that the duration of analgesia might be prolonged by a mean period of 4 h, when 50 to 100 μg of dexmedetomidine are injected perineurally.25,26 This is less than with dexamethasone but needs to be confirmed by robust trials. In summary, perineural dexamethasone at a dose of 8 mg prolongs duration of analgesia by a mean period of 8 hours, while dexmedetomidine at a dose of 50 to 100 μg increases this duration by a mean period of 4 hours. Both can be considered as efficacious adjuncts to local anaesthetics but clinicians should be aware that routes of administration represent off-label indications.

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80 years old, scheduled for major orthopedic surgery, showed significantly decreased incidence of hypotension and bradycardia after CSE versus spinal anaesthesia alone [14]. The same outcome may be obtained with continuous spinal anaesthesia, but with an increased risk of post dorsal puncture headache and cauda equina syndrome [15].

As high surgical conditions provided by CSE blocks were found to be similar with the spinal block, and were superior to those provided by an epidural block alone [16]. The time to the start of surgery was similar in the groups receiving spinal or CSE blocks and the extra time required for insertion of the epidural catheter with the CSE technique did not affect the time of onset of analgesia nor delay the start of surgery in this study [16].

The use of neuraxial anaesthesia has traditionally been contraindicated in patients with severe aortic stenosis. However, general anaesthesia can be riskier than neuraxial anaesthesia for severe aortic stenosis patients undergoing spinal surgeries in the prone position as this can cause a major reduction in cardiac output secondary to diminished preload. A recent report showed the management than neuraxial anaesthesia for severe aortic stenosis patients undergoing spinal surgery in this study [16].

COPD patients are at risk for complications related with the drug used for general anaesthesia, airway management and mechanical ventilation. They are prone to laryngospasm, bronchospasm, cardiovascular instability, barotraumas, and increased risk of apnea due to increased respiratory drive. There is now increasing evidence to support the use of regional techniques in cases traditionally thought possible only under GA [18]. CSE was used to gether with non-invasive Bi-level ventilation for abdominal surgery in severe COPD patients with excellent results [19]. The key of management seems to be avoidance of intubation and perfect management of postoperative pain. A patient with progressive interstitial lung disease produced by Siögren syndrome was successfully managed with CSE with good outcome [20].

Pregnant women with pulmonary hypertension continue to have high mortality rates. Once pulmonary hypertension is diagnosed, usually pregnancy is contraindicated and if pregnancy occurs in this patient abortion is recommended. In these patients elective caesarean section in week 34–36 is recommended as the preferred mode of delivery, and low-dose combined spinal-epidural anaesthesia is recommended as a valid anaesthesia option [21]. CSE was used for caesarean section in patient with Eisenmenger’s syndrome [22], a condition with mortality rates as high as 47% with caesarean section and 33% for vaginal delivery. Peripartum cardiomyopathy also implies high anaesthetic risks and CSE was reported as successfully being performed for caesarean section in these patients [23,24].

Parturients with complex congenital heart disease surgically corrected in childhood are being reported in the literature with increasing frequency: CSE was reported as a valid anaesthetic choice in a patient with a single ventricle, where the surgical effects of mechanical ventilation on hemodynamic was a major concern due to increased intrathoracic pressure [25]. CSE with a small volume of cerebrospinal fluid withdrawal was also used to provide labor analgesia and symptomatic relief in the parturient with idiopathic intracranial hypertension [26]. The authors reported significant improvement in headache symptoms that persisted until discharge from hospital, and absence of new neurologic symptoms. A patient with Arnold-Chiari type I malformation, presenting 7 mm cerebellar tonsil herniation into the foramen magnum, but without syringomyelia was successfully managed with CSE for vaginal birth [27].

Extreme ages seem to have benefits from the use of CSE. When compared with general anaesthesia CSE was found to reduce the frequency of postoperative respiratory adverse events and improved the postoperative cardiovascular stability in small, high risk infants who undergo elective gastrointestinal surgery [28,29] with the disadvantage of longer procedural time. In the elderly populations CSE was found to reduce the risk of postoperative cognitive impairment [30].

The patients presenting for surgical lower-limb revascularization are by their nature at high risk. They are elderly, with severe atherosclerosis, they have coronary disease, they are heavy smokers, and they are at increased risk of death and complications due the medical pathologies they are suffering from, rather than the surgery. Great expectations were set that the choice of anaesthesia technique may improve the outcome for these patients and the best anaesthesia for lower limb revascularization has been debated for many years. Many clinicians have developed strong convictions that certain anaesthetic techniques are preferable for these patients over other. Evidence available from randomized trials comparing neuraxial anaesthesia with general anaesthesia were insufficient to confirm or to rule out clinically significant differences for most clinical outcomes. Evidence suggested that neuraxial anaesthesia may reduce the occurrence of pneumonia, but no definitive conclusions regarding mortality, myocardial infarction and rate of lower-limb amputation could be drawn [31].

CSE is not without risks. General risks of performing neuraxial anaesthesia are implied with the possible exception of hypotension, because if used correctly, CSE may induce an incremental, better tolerated sympathetic block. Certain cases may require a delay to allow the patient to wake up; these cases are met with using the Cochrane collaboration: Compared with general anaesthesia, a central neuraxial block may reduce the incidence of some major complications that can lead to death for patients undergoing surgery with intermediate to high cardiac risk [34]. When neuraxial blocks were used to replace general anaesthesia, the risk of dying during the surgery or within the following 30 days was reduced by approximately 29%. Also, the risk of developing pneumonia (chest infection) was reduced by 55%. When neuraxial blocks were used in addition to general anaesthesia, the risk of dying during the surgery or within 30 days was the same. A difference was not detected for the risk of developing myocardial infarction [34].

The Conclusions: CSE seems a good anaesthesia alternative for high risk surgical patients. With some notable exceptions, studies to support its use are missing and few will be ever available. Only case reports or case series are available to encourage CSE use and they may be enough for enthusiasts. While carefully reading those reports is hard not to observe that presented patients had more in common than CSE use: they were all strictly monitored during anaesthesia as with GA. A skeptic may rightful ask if the presented good outcome was the result of CSE alone or the result of advanced monitoring, making possible early correction of any physiological abnormality. Both enthusiasts and sceptics should remember the words of William Osler when deciding what is best for their patients: “medicine is a science of uncertainty and an art of probability” [35].

References


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rather than GA for lower limb revascularization although there was no longer term difference.6 Larger retrospective studies have also found an improved graft survival in RA groups.7 Length of stay is affected by many factors but LA (compared to GA) has been shown to reduce the length of stay after both CEAI and endovascular aneurysm (EVAR) procedures.8 There is much interest in whether RA reduces morbidity and mortality but this is not covered in this study.

No difference in mortality was demonstrated, but there was a reduction in pulmonary complications in the RA group.9 This mirrors the MASTER trial results (where vascular surgery was among the intra-abdominal operations included) which demonstrated that epidurals reduced respiratory complications, but found no difference in mortality.10 As with other studies examining open AAA surgery and combined fistulas this lack of difference in mortality may indicate that general anaesthesia is probably acceptable, or may be due to underpowering. Recent retrospective data with larger numbers suggested that an epidural may reduce mortality (5 year survival), bowel ischaemia, pulmonary and renal complications in elective AAA patients.11

Arteriovenous fistulas are the optimal form of vascular access for patients requiring chronic haemodialysis. Long-term dialysis lines are associated with thrombosis, central vein stenosis, infection and increased mortality whilst over time a synthetic graft requires more interventional procedures than an AVF. Surgically created AVF can be radio-cephalic, brachio-cephalic or brachio-basilic. Brachio-basilic fistulae generally require a second procedure to superficialise the AVF to facilitate needling for haemodialysis. A large number of fistulae fail at an early stage however (commonly due to thrombosis) and only around 60% are patent at 12 months. Tourniquets are not required and therefore the choice of anaesthetic is either LA alone, RA or GA. Whilst a low risk surgical operation, complications of a GA in this group of patients are still higher due to co-morbidities and many of these can be avoided by using LA or RA. LA is safe and avoids the rare complications associated with a brachial plexus block (BPB). BPB however, unlike LA, results in a sympathetic block which reduces vasospasm, increases brachial artery flow and reduces resistance to outflow by venodilatation. We undertook a randomised controlled trial comparing LA versus a BPB (supravacular block) for primary radio- and brachio-cephalic AVF. The primary outcome was fistula patency at 3 months. A patent fistula might not be suitable for dialysis however as this depends on flow rate, depth from surface, and size. Secondary outcomes measured therefore included functional patency (i.e. suitable for dialysis) along with venous diameters and flow rates in the brachial artery before and after BPB. Results from the 126 patients demonstrated that in the BPB group brachial artery flow increased on average by 150% (p = 0.0006) and cephalic vein diameters and flow rates in the brachial artery before and after BPB. Revascularization procedures. Risk benefit must always be considered on an individual patient and operation basis, and logic suggests risk-benefit will be greater where RA can be used alone (with risk of peripheral blocks less than neuraxial) rather than in combination with GA.

References


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Refresher Course 22: Neurotoxicity, Anaesthesia and the Fetus/Neonate

ESRA7-0546

Neurotoxicity, Anaesthesia and the Fetus/Neonate


Introduction: Each year millions of children over the world undergo anaesthesia for diagnostic and therapeutic procedures. Moreover, the incidence of anaesthesia exposure during pregnancy for maternal or foetal morbidities is estimated to be 1–2% in all pregnancies in the United States. In both circumstances immature brains are exposed to anaesthetic agents. Human epidemiological research suggests a correlation between anaesthesia at a very young age and learning difficulties. Prolonged and repeated anaesthesia administration was associated with long-term adverse neurodevelopmental outcome. Interpretation of these clinical data is difficult because of confounding by the initial pathology. Preclinical research on rodents and non-human primates has demonstrated that the administration of general anaesthetics during critical periods of neurodevelopment results in neuronal damage and long-lasting functional impairment. Despite convincing animal data, the effects of anaesthesia on brain development in human fetuses and infants remain unclear. Moreover there are no human data available on neurodevelopmental outcome of utero exposed foetuses. Nevertheless the heightened concern surrounding the safety of anaesthetic agents during pregnancy and in early infancy has motivated the US Food and Drugs Administration to the addition of a warning to the labels of most commonly used anaesthetics and sedation drugs. This label indicates “repeated and lengthy (>3 hours) use of general anaesthetic and sedation drugs during surgeries or procedures in children younger than 3 years or in pregnant women in the third trimester may affect the child’s developing brain.” www.fda.gov/Drugs/DrugSafety/
In the last decade of the past millennium, initial data from experiments with various species showed that all commonly used anesthetic agents administered to the developing brain caused widespread neuroapoptosis. The mechanisms underlying the anesthetic-induced neurotoxicity are poorly understood. It is suggested that NMDA-receptor antagonists, like ketamine, induce neuronal death due to compensatory up-regulation of the NMDA receptors, resulting in toxic changes in ion-fluxes. GABA-receptor agonists cause similar effects via excitoxic mechanisms. Moreover, for years, the neurobehavioral and neurocognitive changes observed in those exposed animals were assumed to be a direct consequence of this loss of neurons. Recently, researchers doubt this causal relationship and attribute the impaired neuro-cognitive outcomes to more complex mechanisms. They suggested that besides provoking neuro-apoptosis, general anesthetics cause lasting developmental modifications in the neuronal network. Persistently decreased dendritic spine formation and may theoretically lead to abnormalities in ultrastructure and function of emerging synapses. Relating these advanced histo-pathological findings to specific neurocognitive deficits will help to demystify the mechanisms of anesthesia induced developmental toxicity. Presently, since the suggestions made in rodent models translate to anesthesia and developmental impairment, a plethora of animal studies have shown neurodegenerative effects of anesthetic drugs in young animals. The vulnerability of the brain to general anesthetics was thought to be maximal at the time of ‘brain growth spurt’ (peak synaptogenesis). The timing of the peak synaptogenesis is species dependent and of particular importance when investigating developmental outcome at a specific moment.

Rodent-related research: In the last decade of the past millennium, initial research on the effects of anesthetic agents on developing brains was performed on rodents. Postnatal day 7 was thought to be the period of maximal synaptogenesis in rats. They found that NMDA-receptor antagonists administered on postnatal day 7–old rats caused a significant reduction in the number of neurons. The same findings were observed when exposing these young rats to -aminobutyric acid (GABA)A receptor agonists. GABA and the L-amino acid neurotransmitter glutamate play an important role in the regulation of neuronal survival and migration, axonal and dendritic structure, synaptogenesis and neuroplasticity. Since the NMDA- and GABA-systems are critically involved in brain development, it is consistent that substantial disturbance of their normal function have a negative impact on the developing brain. In addition, after the initial findings of neuro-apoptosis, rodent research started focusing on the specific distribution of neuronal cell death and the most vulnerable timing of exposure (highest peak of synaptogenesis). Neurological abnormalities were observed after exposure of all commonly used anesthetics and were distributed over many brain regions. More recent research focuses on more specific changes (neuroplasticity), including disruption of mitochondrial integrity and function, impaired giall development and function, altered dendritic spine morphology and density, altered synaptic morphology and induced synaptic loss, impaired neurogenesis, and inhibition of long-term potentiation (LTP). The relationship between duration of anesthetic exposure, different anesthetic doses and repeated episodes of anesthesia, to the magnitude of the neurological damage was investigated in several studies. The overall conclusion was that the longer the anesthesia episode, the higher the dose and the more repetitive exposures, the more serious was the neurotoxic effect. Vice-versa, exposures of short duration produced only subtle alterations in the brain. Current research evaluates the time-course of the imposed neuronal damage or how long the impact of anesthesia persists. More invasive technology allows the researcher to evaluate the same animals at different moments in time (without sacrificing) and to get an idea of the sequence of changes after the anesthetic exposure.

The neuronal damage observed in the immature rodent brains after exposure to anesthetics leads to functional disruptions. Special tools to evaluate neuro-cognitive function in rodents were developed and indicated impairment in both spatial learning and reference memory. These aspects of cognitive function are mainly situated in prefrontal cortex and the hippocampus and correlates well with the predominance for apoptosis in that same brain region. The cognitive deficits caused by anesthetic exposure early in life have been shown to endure into adulthood. Similarly to the extent of neuronal damage, cognitive dysfunction was more pronounced after higher concentrations, longer and/or repeated exposures. The significance of results from rodent trials in terms of human relevance has been strongly questioned. Young rodents are very small what makes it practically difficult to maintain physiological parameters during the experimental anesthesia (e.g. no continuous control of blood pressure). More over the duration of brain maturation and the timing (before and/or after birth) of the brain growth spurt vary between different species (e.g. humans and rodents) but also between rodents.

Research involving non-human primates (NHP): Research involving NHP is particularly well suited to study many of the above-mentioned issues, as the species is much closer to humans. Adequate high-level anesthesia care is possible in newborn monkeys without losing systemic homeostasis and with maintaining physiological parameters during anesthesia. More over the physiology, pharmacology and neurodevelopmental maturation show many similarities with the human race. As in humans the most vulnerable period in NHP for neurotoxic damage following anesthesia exposure is the brain growth spurt, the period of the most rapid synaptogenesis. This period starts in both species antenatal and expands into the postnatal life. The NHP-model results in a better model regarding the neurotoxic effects of general anesthetics. As in line with the rodent-data, initial experiments in which young monkeys were exposed to anesthesia, showed neuronal damage. Data from these NHP studies show that anesthesia exposure highly perturb neural development and will worry many pregnant women and parents of young children.

Future research: There is still a need for more intense preclinical and clinical research since many questions about anesthetics-induced neurotoxicity remain unresolved. A number of substances have been recognized as preventer or mitigator of the therapeutic effects on the neurobehavioral impairments associated with anesthetic exposure at a young age. L-Carnitine has neuroprotective properties by preventing mitochondrial dysfunction. Lithium protected against apoptosis in different animal species. Even more interesting are dexmedetomidine and the noble gas xenon.
Conclusion: We can conclude that nearly all frequently used general anaesthetics cause neuronal damage in the immature brain and neurobehavioural impairment after exposure to young animals. Besides neuronal apoptosis, other mechanisms of brain damage (neuropathology) have been suggested. Analogies they result in (long lasting) cognitive and behavioural impairment. Human retrospective data were reasonably inconclusive with some (but not all) showing an association between anaesthesia exposure in early childhood and neurocognitive impairment, but no clinical study could provide evidence for a causal relationship. Two recently published prospective studies (GIAS-study and PANDA-study) could not proof that a brief exposure at a young age resulted in poor neuro-cognitive outcome.

References

REFRESHER COURSE 23: THE IMPACT OF THORACIC EPIDURAL ANAESTHESIA ON HARD OUTCOME PARAMETERS

THE IMPACT OF THORACIC EPIDURAL ANAESTHESIA ON HARD OUTCOME PARAMETERS


This article will focus on hard outcomes (severe morbidity as well as mortality) that could be expected to be reduced by the use of Thoracic Epidural Anaesthesia (TEA). The story really started in 1987 with the report by Yeager et al. showing that TEA might be associated with a significant reduction of postoperative morbidity and mortality in high risk patients that underwent major thoracic, intra-abdominal or vascular surgery (1). In this randomized controlled study, morbidity rate (mostly cardiovascular failure and infectious complications) was 9/28 in the TEA group vs 19/25 in the control group (P = 0.002). Concomitantly, postoperative mortality was significantly reduced in the TEA group (0/28 vs 4/25 P = 0.04). This observation was followed by a bunch of pathophysiologic arguments demonstrating that additionally to the analgesic effect, TEA would be likely to control the stress response to surgery by direct neural blockade, and therefore to reduce the sympathetic, metabolic and inflammatory reactions involved in postoperative cardiovascular, digestive, pulmonary, cataleptic and coagulations disorders (2). This elegant concept was further developed and has contributed to expand the indications of periperative TEA (3,4). The first major meta-analysis aimed at quantifying the beneficial role of epidural analgesia/analgesia on hard postoperative outcome, including 141 trials and almost 10,000 patients operated before 1997, came to the same conclusions, with a positive impact on postoperative mortality (OR 0.67 [95%CI 0.54-0.99]) (5). However, it was difficult to draw definite conclusion from this study. Population was unselected and pain strategies highly heterogeneous. The benefit was mostly observed on orthopaedic surgery (lumbar epidural analgesia). Spinal analgesia/analgesia was mixed with epidural, and drug regimens were very different across studies. This casts some doubts about the clinical meaning of such conclusions. However, these favorable results were thereafter reinforced by another concomitant meta-analysis, which shared similar limitations, showing that TEA was able to reduce postoperative myocardial infarction (-5.3% [95%CI -0.9%-0.7%] P = 0.04) (6) and severe pulmonary infectious complications (RR = 0.54 [95%CI 0.43-0.68] after major abdominal or thoracic surgery (7). More recently, Popping et al. released a new meta-analysis, focusing only on epidural using local anesthetics (with or without opiates) and maintained for at least 24 h postoperatively (8). The methodology to select articles was rigorous and probably led to a more accurate estimation than did other previous meta-analysis on the topic. The conclusion was a reduction on mortality rate when using TEA (3.1% vs 4.9%, OR = 0.6 [95%CI 0.39-0.93] corresponding to a NNT = 60) (7). Whatever, despite a great attention paid to the studies selected, meta-analysis mixing studies from different periods have some strong limitations (9). Developments made within perioperative care principles during the last 10 years have provided a major contribution to the overall reduction in postoperative morbidity/mortality (10). The postoperative mortality rate was very high (16%) in the Yager study performed in 1985 (1). The incidence of postoperative pneumonia decreased from 34% to 12% between 1966 and 2006 (8). This makes the relative benefit of TEA smaller over time. In the meta-analysis by Popping et al., 75% of the papers are from before 2004. Interestingly, mortality did not differ between TEA and Control in the few studies performed after 2004 (10). Because of these numerous limitations, conclusions from meta-analysis have to be confronted with other methodological approaches, and above all with randomized controlled trials.

Finally, another way to evaluate this question could come from large retrospective cohort study analysis (11). Based on administrative databases, a sample of 259037 cases were analyzed, 22% of them having received TEA, whatever the surgical procedure. TEA was associated with a small but significant improvement of 30 days survival (mortality = 1.7% vs 2% in control group. RR = 0.89 [95%CI 0.81-0.98] P = 0.02). The NNT was 477. This points out a very low impact in clinical practice.

In conclusion, TEA has been already extensively studied and many data are available to demonstrate beneficial effects on pain relief, stress reaction and paralytic ileus after major thoracic and/or abdominal surgery. Impact on major morbidity and mortality are far more difficult to appraise and remains still controversial. Meta-analysis tend to show a reduction in postoperative mortality. In contrast, large prospective comparative study did not confirm these observations. These discrepancies could be related to time-dependent improvements in perioperative care, confounding factors and heterogeneous practices. In particular, several parameters, such as the direct role played by local anesthetic and the duration of the epidural infusions are unresolved issues that may by themselves mislead the conclusions. Additionally, since the implementation of Enhanced Recovery Protocols (ERAS), it is known that a lot of pre-, intra- and postoperative factors have to be controlled to significantly improve the postoperative recovery course. Certainly TEA has a role to play among these factors, especially during major surgical procedures. But to date, it is difficult to build benefit/risk ratio using hard outcomes parameters.

References


REFRESHER COURSE 24: ABDOMINAL WALL BLOCKS AND WOUND CATHETERS

ESRA7-0494

ABDOMINAL WALL BLOCKS AND WOUND CATHETERS


Abdominal surgery is characterized for a long time ago by moderate to severe postoperative pain, mainly induced by mobilization. Postoperative pain relief, besides to improve patient’s comfort, is likely to have beneficial effects on postoperative recovery course (12). But abdominal surgery is moving to less invasive procedures, and the development of laparoscopic approach. These developments are associated with less postoperative pain, less opiate requirements and less metabolic (stress) reaction. Pain management is a cornerstone of the implementation of Enhanced Recovery After Surgery (ERAS) protocols, allowing patients to ambulate in the immediate postoperative period, and preventing them, at least partly, from opiate-related side effects (3,4). In this context, anesthesiologists have to think about the development of new strategies to manage postoperative pain (5).

Epidural analgesia (EA) is a well-established technique and has been for a long time the gold standard for pain management after major abdominal surgery (6). Besides to analgesic effects, EA has demonstrated beneficial impact on postoperative outcomes, including a decrease on pulmonary complications, a reduction of the duration of intestinal ileus, and some beneficial metabolic properties (7). Undoubtedly, EA remains the best analgesic technique for a lot of procedures, such as major perineal surgery, upper abdominal and esophageal surgery as well as thoracic surgery. In these indications, the benefit/risk ratio is clearly in favor of doing EA as the first line analgesic treatment (8). However, recent reports have highlighted that epidural analgesia may slow down recovery after laparoscopic colorectal resection within an enhanced recovery pathway, without adding obvious benefits (9,10). It has been shown that EA was not superior to intravenous lidocaine infusion for pain relief after laparoscopic colorectal resections (11). This makes epidural analgesia no longer indicated for pain relief in this setting (12).

Similar conclusions were drawn for liver resection, showing that EA was associated with an increase use of blood transfusion and a longer hospital stay as compared to parenteral analgesia (13,14).

The development of parietal infiltration (Local Anesthetic Wound Infiltaration – LAW) was based on the recognition that a major component of postoperative pain arises from surgical wound incision (15). Above all, unlike EA, wound infiltration is very easy to implement, can be performed in almost all patients, has a very low failure rate and is quite harmless. Preprocedural ropivacaine continuous infusion for 48 h may provide effective pain relief after open colorectal resection, with a reduction of opiate consumption and a shorter length of hospital stay as compared to patient-controlled iv analgesia (16). Some recent reports have shown LAW to be able to be an efficient alternative to EA after abdominal surgery (17). Where the same local anesthetic regimen (10 ml/h ropivacaine 0.2%) was administered either by LAW or EA routes, no difference was observed on pain relief or recovery course, with SSSA administration being associated with a faster return of gastrointestinal function than EA (18). This has been further confirmed in large sample size study (19) and even in a recent meta-analysis (20). Similar conclusions came from liver resection where LAW has been shown to provide similar pain relief than EA (21). Additionally, wound infiltration is able to improve postoperative ventilatory function, after colorectal resection (22) as well as after liver surgery (23).

Additional supports advocating for the use of LAW come from recent pathophysiological data highlighting that at least a part of the nociceptive inputs coming from the peritoneum and abdominal viscera do not run along the spinal nociceptive pathway and could be blocked by direct peritoneal application of local anesthetics (24). This may explain why preperitoneal placement of the wound catheter appears as effective (16). However, the place of LAW is still the subject of many controversies because there are still a lot of unresolved questions about the best modality to use it (catheter placement, flow rate…). In the future, it can be expected that long-lasting local anesthetic formulation may be able to provide adequate pain relief after a single wound injection (25).

Other analgesic techniques have been developed to block parietal innervation (somatic pain) of the abdominal wall (intercostal, ilio-inguinal and ilio-hypogastric nerves). The use of Ultrasound-guidance has allowed for the updating of several locoregional approaches. Paravertebral block, usually performed for thoracic surgery, appears as a promising technique for postoperative pain relief after abdominal surgery, despite a quite high failure rate (26). Transversus Abdominis Plane block (TAP) seems to be effective by reducing pain scores and 24-hr opiate consumption (27). But the magnitude of the expected benefit is still controversial (28). It has been shown that TAP was not superior to wound infiltration (trocar and extraction site) after laparoscopic colorectal resection (29). Finally, ultrasound-guided Rector Sheath block may offer an interesting analgesic solution after midline incision (30). These parietal blocks are usually performed as a single-shot administration, explaining a relatively short duration of action. Several reports have documented the use of catheter that may prolong their efficacy. It should be noted that these techniques are restricted to parietal innervation and do not have any local effect on wound injury, as compared to wound infiltration.

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Myofascial pain syndrome (MPS) is a prevalent and frequent neurosensory feature. Electrophysiology: Electromyographic studies have revealed spontaneous electrical activity generated at MTrPs that may explain its different behavior. For many clinicians and investigators, the finding of myofascial trigger points (MTrPs) is required to assure the diagnosis of MPS. MTrPs are hyperirritable areas in a taut band of muscle tissue or fascia that are tender when compressed, and give rise to referred pain. They are commonly associated with limited range of motion, fatigue, impaired muscle coordination, and vegetative phenomena.

Etiology: Common etiologies of myofascial pain may be from direct or indirect trauma, spine pathology, exposure to cumulative and repetitive strain, postural dysfunction, vitamin deficiencies, sleep disturbances, joint problems and physical deconditioning. Different studies have demonstrated that MTrPs are associated with several pain conditions, including radiodensities, disk pathology, tendinitis, craniofacial dysfunctions, migraines, tension type headaches, carpal tunnel syndrome, computer-related disorders, whiplash-associated disorders, spinal dysfunction, post-herpetic neuralgia, complex regional pain syndrome etc.

Pathophysiology: The pathophysiology of MTrPs is incompletely understood, and a number of morphological changes, neurotransmitters, neurosensorial features, electrophysiological features, and motor impairments have been implicated in its pathogenesis:

- Morphological changes: A significant increase in stiffness has been found within the taut band of MTrPs.
- Neurotransmitters: Higher levels of neuropeptides (e.g., substance P or calcitonin gene-related peptide), catecholamines (e.g., norepinephrine), and proinflammatory cytokines (e.g., tumor necrosis factor alpha, interleukin 1-beta, interleukin 6, and interleukin 8) have been found in active trigger points.
- Neurosensorial features: Spreading referred pain, hypersensitivity to nociceptive stimuli (hyperalgesia) and non-nociceptive stimuli (allodynia), mechanical pain sensitivity, sympathetic facilitation of mechanical sensitization, facilitation of both referred and referred pains, and attenuation of cutaneous blood flow.
- Electrophysiology: Some studies have found spontaneous electrical activity, attributed to an increase in miniature endplate potentials and excessive acetylcholine release in MTrPs, although future studies are needed to confirm these findings.
- Motor impairments: MTrPs can induce changes in normal muscle activation patterns and result in motor dysfunction. A recent hypothesis proposes that central nervous system-maintained global changes in α-motor neuron function, resulting from sustained lateral depolarization, underlie the pathogenesis of MTrPs. A continuum of muscle nociceptor sensitization between active trigger points (spontaneously painful) and latent trigger points (painful only after evoked stimulus) may explain its different behavior.

Different studies have demonstrated that MTrPs are associated with several pain conditions, including radiodensities, disk pathology, tendinitis, craniofacial dysfunctions, migraines, tension type headaches, carpal tunnel syndrome, computer-related disorders, whiplash-associated disorders, spinal dysfunction, post-herpetic neuralgia, complex regional pain syndrome etc.

REFRESHER COURSE 29: HOW TO MANAGE MYOFASCIAL PAIN SYNDROMES?

ESRA7-0480

HOW TO MANAGE MYOFASCIAL PAIN SYNDROMES?

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Introduction: Myofascial pain syndrome (MPS) is a prevalent and frequent cause of visits to primary care physicians and pain clinics. Muscle pain as a result of trauma, injury, overuse, or strain, frequently resolves in a few weeks with or without medical treatment. In some cases, however, it persists long after resolution of the injury and it may even refer to other parts of the body, usually contiguous or adjacent rather than remote. This heralds the sensitized state, one of the features of a chronic pain disorder, in which the pain itself is the pathology and requires medical intervention for its resolution.

The term “myofascial” indicates that both muscle and fascia are likely to be contributors to the symptoms.

There are some tools that can help us with the diagnosis:
- Electromyographic studies have revealed spontaneous electrical activity generated at MTrPs loci that was not seen in surrounding tissue. Using a needle with a monopolar electrode connected to a device that amplifies electromyographic signals from the muscle and transforms them into sounds can provide us an acoustic feedback in order to help physicians locate areas of muscle activity.

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However, there is disagreement in electromyography and physiology literature on the significance of abnormal motor endplate potentials and endplate noise.

- In the last years ultrasound has been used to identify MTrPs. Trigger points have been shown to be mainly hypechoicogenic but also hyperechoicogenic spots with fusiform or elliptical shape. Furthermore, normal patients and patients with tendinopathies without fibromyalgia syndrome, also exhibited similar hypechoicogenic spots as seen in MTrPs. This, together with the interrater variability, muscle, fasciae anisotropy, and the difficulty in the visualization of deep structures, has made researchers look for additional tools to improve the diagnostic accuracy. Blood flow in the neighborhood of MTrPs has been assessed using Doppler imaging and a grading scale has been proposed. Preliminary findings show that active MTrPs have significantly higher peak systolic velocities and negative diastolic velocities compared with latent MTrPs and normal muscle sites when measured in the vicinity.

- Ultrasound Elastography in its different modalities, vibration sonoelastography, strain elastography and the new shear-wave sonoelastography, may evaluate regional stiffness and it is a useful tool that can help us with the diagnosis and treatment of MTrPs. The gray- or color-scale encoding is adjustable by the user. Typically, red is used to represent softer tissues, blue represents harder tissues, and yellow or green represent tissues of intermediate elasticity.

**Treatment:** Management of MTrPs is multimodal.

Travell and Simons were not the first to identify and develop a treatment for MTrPs, but they were among the first ones to recognize the relationship of the trigger points to MPS. They proposed that deactivating MTrPs was an essential component to successfully treating MPS.

The most commonly used interventions are as follows:

Among the invasive therapies, scientific articles report mixed results. Generally, dry needling, anesthetic injection, steroids, and botulinum toxin-A of the MTrPs have all been shown to provide pain relief.

While the etiology of MPS and the pathophysiology of MTrPs are not yet fully understood, some investigators are suggesting that treatments should focus not only on the MTrPs, but also on the surrounding environment (e.g., fasciae, connective tissue, etc.).

In this sense ultrasound-guided interfascial block, a known regional anesthetic technique, is an approach in myofascial pain with minimum traumatic damage to the muscles. Local anesthetics injected in the interfascial planes provide direct blockade of somatic nerve endings and perhaps sympathetic nervous fibers, both also piercing each fascia and giving profound long-lasting muscle relaxation and pain relief. Cho et al have combined interfascial block with pulsed radiofrequency with good results. Other treatments are: massage, ischemic compression, pressure release, and other soft tissue interventions.

MTrPs injections are usually safe and effective. However, although very rare, there have been reported some complications resulting in pneumothorax, epidural abscess, skeletal muscle toxicity, and intrathecal injection. Two reviews of the American Society of Anesthesiologists closed claims analysis have shown increasing number of complications related to interventional long-term pain management, with MTrPs injections being associated mainly with pneumothorax. Ultrasound may, in theory, reduce the risk of complications by identifying potentially hazardous structures in the path of the needle, especially in cases where the MTrPs are in deep fasciae or muscular layers.

**Conclusions:** MPS is a common musculoskeletal pain disorder. It is characterized by local and referred pain, perceived as deep and aching, and by the presence of MTrPs in any part of the body. MTrPs are hyperrirritable areas of muscle tissue or fascia that are tender when compressed and give rise to referred pain. The diagnostic of MPS is still based on clinical criteria. However, because many of these criteria are nonspecific and overlap with other causes of regional pain, diagnosis can be difficult.

The clinical utility of ultrasound guidance lies in its potential to increase the safety and efficacy of needleling procedures. Compared with landmark-based techniques, ultrasound guided procedures can ensure accurate needle placement within a specific muscle group, which may be particularly advantageous for deeper target. It also decreases adverse events while offering the maximum benefit to the patient.

**References**


**SYMPOSIUM I: POSTOPERATIVE ANALGESIA FOR ORTHOPEDIC UPPER AND LOWER LIMB SURGERY**

**ESRA7-0485**

**POSTOPERATIVE ANALGESIA AFTER LOWER LIMB SURGERY: OPTIMAL BLOCK SELECTION**

Sauter A.R. Oslo University Hospital, Department of Research and Development, Oslo, Norway.

**General considerations:** Patients undergoing orthopaedic surgery experience severe pain in the postoperative period. When pain interferes with mobilisation...
Patients with PNBs also performed for lower limb surgery in order to avoid compromising motor function. These nerves innervate the tibia, fibula, ankle joint, and foot. How- ever, the saphenous nerve, a sensory branch of the femoral nerve, supplying the skin of the medial calf and foot, is commonly blocked for ambulatory surgery to decrease the need for oral analgesics. Regional anesthesia and analgesia during and after surgical procedures of the lower extremity are equally efficient for these indications.

In the recent years, selective blocks of peripheral nerves have been advocated as alternatives to brachial plexus blocks. For shoulder surgery blocks of the suprascapular nerve and axillary nerve can be performed. Ultrasound guidance is still mandatory, even though nerve structures can now be visualised.

Upper extremity blocks: Blocks of the brachial plexus are commonly used for anaesthesia and analgesia during and after surgical procedures of the upper extremity. Brachial plexus blocks are performed on different levels. For shoulder surgery interscalene approaches are commonly chosen. For surgical procedures of the distal humerus, elbow, forearm, wrist and hand, more peripheral tech- niques are chosen; the use of supraclavicular, infraclavicular, and axillary blocks are equally efficient for these indications.

In the recent years, selective blocks of peripheral nerves have been advocated as alternatives to brachial plexus blocks. For shoulder surgery blocks of the suprascapular nerve and axillary nerve can be performed. Ultrasound guidance is still mandatory, even though nerve structures can now be visualised.

Lower extremity blocks: The nerves supplying the lower extremity arise from the lumbar and sacral plexus. The femoral, obturator, and lateral cutaneous nerve can be blocked individually or by a single injection into the lumbar plexus. Femoral nerve blocks are often used for postoperative pain treatment after knee surgery. Since the knee joint is supplied by branches from the femoral, sciatic, and obturator nerves a block of only the femoral nerve should only be used as an alternative to femoral nerve block with or without ultrasound guidance. Curr Opin Anaesthesiol 2009;22:655–60.


SYMPOSIA 2: PROSPECT SESSION

ESRA7-0472

THE METHODOLOGY OF PROSPECT COMPARED TO OTHER METHODS OF SYSTEMATIC REVIEWS AND META-ANALYSIS

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Several international guidelines exist (Australian, US, etc.) on perioperative pain management, but mostly providing general information on benefits and risks of different analgesic methods which may have limitations regarding clinicians' choice of optimal analgesic technique in specific procedures. Consequently, PROSPECT was initiated to provide procedure-specific information based on RCT's on different analgesic techniques. At the same time, the literature is overflowed by systematic reviews and meta-analyses on perioperative pain management, which also may be helpful for clinicians in their medical decision making, but unfortunately poses problems for several reasons. As an example, within one year 6 systematic reviews have appeared on the effect of gabapentinoids in hip and knee arthroplasty, not even including the same number of RCT's. The most important problem for the clinician when making a procedure-specific choice of analgesic technique is the need for specific information about the basic analgesic treatment in the RCT's (which is usually not considered) thereby limiting interpretation. Consequently, future "guidelines" whether being PROSPECT or other systematic reviews and meta-analyses need more detailed assessment regarding the quality of the RCT's, with regard to use of pure placebo or a combination with an evidence-based basic analgesic regimen and the argument for another meta-analysis.

References


References


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References


SHORT SYMPOSIA 4: EDUCATION IN PAEDIATRIC REGIONAL ANAESTHESIA

ESRA7-0493
WHAT RESIDENTS/TRAINEES NEED TO KNOW ABOUT REGIONAL ANAESTHESIA IN CHILDREN

Roberts S, Alder Hey Children's NHS Foundation Trust, Jackson Rees, Liverpool, United Kingdom.

What do Trainees NEED to know?

During this 20 minute lecture I will be covering the following areas of practice

1. Anatomical, Physiological and Pharmacological differences of children compared to adults.
2. Preoperative assessment – important aspects of history and examination, consent andassessment, backofen.
3. Consent – Information to child and family
4. Block selection – Peripheral vs central. Catheter or not?
5. Theatre – Practicalities of block placement including in an awake child.
7. Postoperative management in First stage, and Second stage recovery including catheter management.
8. Training – discuss the difficulties of learning these techniques and how to overcome them.

Finally I hope that we can see that it is not just about the block, it is how we manage the whole patient, family and indeed our ward staff.

SYMPOSIA 5: ANAESTHESIA FOR CESAREAN SECTION

ESRA7-0506
GENERAL ANAESTHESIA FOR C-SECTION

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Introduction: C-section (CS) under general anaesthesia has always been associated with a higher mortality rate compared to regional anaesthesia. Although anaesthetic related maternal mortality significantly decreased over the past decades, still 1-2% of maternal mortality is directly or indirectly attributed to anaesthesia. One of the most feared problems during general anaesthesia in the obstetric population is airway management, which can be difficult due to pregnancy related changes of the airway, like oedema, and an increased risk of pulmonary aspiration. Furthermore, patients for CS carry an increased risk of intra-operative awareness.

General anaesthesia for CS:

The indication for general anaesthesia for CS is limited. Most anaesthesiologists only apply general anaesthesia in a grade 1 emergency CS, when there is not enough time to perform a neuraxial technique or in case neuraxial techniques failed.

Failed airway management is the most feared risk of general anaesthesia in the obstetric population. A recent review shows an incidence of 2.3 per 1000 general anaesthetics for failed obstetric intubation, whereas fatal failed obstetric intubation has an incidence of 2.3 per 100 000 general anaesthetics. The availability of new techniques, like the supraglottic airway devices, has had a marked influence on the management of failed intubation in this population and has led to new guidelines specific for the obstetric population.

Since most general anaesthetics for CS are performed for grade 1 emergency CS in patients with a non-fasting status, rapid sequence induction (RSI) is routine in this population. The classic RSI for CS consists of 4-5 mg/kg thiopental and 1-2 mg/kg suxamethonium. Anaesthesia than is maintained with volatile anaesthetics, like isoflurane or sevoflurane. High concentrations of volatile anaesthetics (>1 MAC) should be avoided to prevent foetal depression and the dose-dependent tocolytic effect of volatile anaesthetics. Opioids are postponed until after clamping of the cord, which is, in combination with the lower concentrations of volatile anaesthetics, a risk factor for per-operative awareness. However over the last years literature shows more and more evidence of alternative strategies for performing general anaesthesia in the obstetric population, other than the classic RSI.

Although some studies show a higher incidence of short-lived neonatal depression postpartum, propofol gains popularity as induction agent of choice in non-compromised and healthy patients for CS, since in adequate doses it is more reliable in preventing per-operative awareness and in reducing cardiovascular response to laryngoscopy and tracheal intubation. Considering muscle relaxants, it is essential in the obstetric population, known for their increased risk of potential difficult airway management, to use either a short-acting muscle relaxant or a muscle relaxant that can be reversed immediately.

With the introduction of sugammadex, rocuronium (1 mg/kg) became an alternative to suxamethonium in this population, mainly based on its reversibility and more favourable safety profile.

Opioids are usually postponed until after clamping of the cord in order to prevent foetal depression. This however not only increases the risk of per-operative awareness, it also increases the risk of stroke due to the hypertensive cardiovascular response to laryngoscopy and tracheal intubation. Studies show that short acting opioids (remifentanil) during induction can prevent awareness and also attenuate the hypertensive response during intubation. Attenuating the hypertensive response during intubation is especially important in preeclamptic patients and other patients who might suffer serious consequences from marked hemodynamic fluctuations. Literature shows strong evidence of a beneficial effect of remifentanil in this specific population. Even more, higher neonatal base excess and pH suggest there is not only a beneficial effect for the mother, but also for the neonate. However routine use in the healthy obstetric population is discouraged, since the use of remifentanil is associated with a brief period of neonatal respiratory depression.

In conclusion, over the past decades, indications and anaesthetic strategies for general anaesthesia for CS have changed and mortality rate for CS under general anaesthesia has decreased. However, it is essential that indications for general anaesthesia are weighted carefully in each patient.

References


SPINAL ANAESTHESIA FOR C-SECTION

ESRA7-0467

ESRA Abstracts Regional Anesthesia and Pain Medicine • Volume 42, Number 5, Supplement 1, September-October 2017

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Spinal anaesthesia (SA) is by far the most popular anaesthetic technique for caesarean delivery (CD).

The survey of clinical practice reveals that anaesthesiologists use very different methods for measuring height of SA and with very different endpoints [1]. Russell et al. in the classic papers, has been defined the adequate level of SA for CD being complete loss of touch at Th5 [2, 3]. The loss of sensation to pin-prick or cold occurs up to six dermatomes higher than loss of touch; therefore the endpoint for these methods should be different [4]. Loss of sensation to any stimuli is a subjective and therefore considerable inter- and even intra-individual variations exist, which makes hard to give one and only right answer.

The maternal position during induction of SA is also matter of discussion. The position can influence spread of local anaesthetic (LA) and incidence of hypotension promoting blood pooling. Current evidence suggests that left lateral with head tilted up 10° or sitting position provides reliable time of onset and height of anaesthesia using hyperbaric solutions with no increase in incidence of the hypotension [5, 6]. The bupivacaine is a standard for SA providing reliable speed of onset and duration, 2-chloroprocaine is an alternative, but regression of the block is of concern. Maes et al. compared hyperbaric bupivacaine with 2-chloroprocaine and found that 40 mg of 2-chloroprocaine produces fast and reliable block with same time for regression of motor blockade [7].

The baricity of the LA solution is believed to be key factor influencing the spread of SA, speed of onset and need for conversion to the general anaesthesia. Recently published Cochrane review on isobaric and hyperbaric solutions failed
to support all these beliefs, except one. Hyperbaric solutions advantage is faster onset of anaesthesia at T4 level [8].

The arterial hypotension is common side effect of the SA. The incidence of hypotension in the studies without prophylactic vasopressor infusions has been reported up to 100% [9]. One way to conquer hypotension is reducing the dosage of LA. The dosage of LA has two opposite effects: lower the dose, less hypotension and lower dose more additional analgesia, recent meta-analysis on low (<8 mg) and conventional (>8 mg) bupivacaine dosage confirm it. The estimated risk of hypotension was 0.78 (0.65 – 0.93) and the risk for supplemental anaesthesia was 3.76 (2.38 – 5.92) [10]. Some of the studies included used combined spinal-epidural technique and used epidural catheter for supplementation and CSE technique considered to be must, when using low dose [9]. The other way is using vasopressors. A lot of studies has been done and as a result preventive vasopressor administration became standard of care, more precisely using of alpha-agonists (phenylephrine or metaraminol) [11]. But using a-agonists results in lowering heart rate and cardiac output: alpha- and beta-agonist norepinephrine infusion has been studied successfully, but the results of RESPOND trial need confirmation in other randomised trials [12].

The rapid sequence SA – a technique for category 1 CD described by Kinsella et al [13]. Recent published guidelines for skin antisepsis during SA [14] launched the discussion of appropriateness of the technique. In conclusion, the SA is a standard of care in the management of Caesarean section. In high use of LA, baricity and maternal position during induction is crucial importance for fast and reliable block. Maternal hypotension is the most common side effect and can be treated by lowering dose of LA and preventive using of vasopressors. The rapid sequence technique need to be modified in the light of new antisepsis guidelines.

References
affected nerve. Although the symptoms usually resolve within 2 to 4 weeks, approximately 10% of the patients will develop PHN. Although there is a controversy regarding PHN definition, the most broadly approved definition is as it persists more than 3 months after the onset of rash in the same affected area. This complex painful condition is the net result of ongoing changes in both the peripheral and the central somatosensory processing. The most common symptoms experienced include a constant, deep, aching, burning pain along with lancinating pain, allodynia and itching.

During the acute herpes zoster episode the dormant virus becomes activated, it replicates and propagates. Newly synthesized viral particles undergo axonal transport along the central and peripheral axons of all types of sensory neurons. A generalized inflammatory response takes place within the nerve. The net effect is generalized necrosis and cell death, affecting not only the skin, but also the nerve roots and ganglia, with the characteristic atrophy of the posterior part of the spinal cord and the degeneration of the dorsal root ganglia in patients with acute herpes zoster. NP is the net effect of three different and contributing mechanisms. Peripheral ectopic discharge, direct excitability of second order neurons, and the degeneration of descending nociceptive fibers. The degeneration occurs in such patients, with normal and excessive input from peripheral nociceptors, generating and enhancing central response. The development of central sensitization along with ongoing ectopic discharge and descending dis-inhibition contributes to the phenomena of causalgia, excruciating pain, hyperalgesia and allodynia, which is often found in patients with acute herpes zoster. At the cellular level, PHN promotes up-regulation of TRPV receptors in nociceptors and an increase of the proportion of sodium and potassium channels. Additionally, a well described loss of GABA interneurons at the spinal level explains the dysfunctional descending inhibitory system. PHN has been ascribed into two different models of nerve damage, that is irritable nociceptor model and the deafferentation model.

Regarding treatment, at first, comorbidities must be taken into consideration. The typical PHN patient takes on average 5 or more different drug categories, whereas renal or hepatic impairment is quite frequent in these patients, with few of them suffering from balance or gait disturbances. Under these circumstances the American Geriatric Society recommends starting treatment with low doses, but also titrating slowly as well. Tricyclic antidepressants (TCAs) and a2 delta ligands are considered as first line treatment for post herpetic neuralgia. TCAs efficacy is attributed to the reinforcement of the descending inhibitory anti-nociceptive pathway, through the block of serotonin and noradrenaline reabsorption. Between different TCAs groups, tertiary amines (like amitriptyline) have been proven more effective. Meta-analyses of four placebo RCTs of TCAs have estimated that the NNT for one patient to obtain meaningful pain relief with amitriptyline, desipramine, or nortriptyline is 3; the estimated NNH is 16. On the other hand there are no conclusive data regarding the efficacy of SSRIs or SNRIs for the PHN management. a2 delta ligands (gabapentin, pregabalin) are also considered as first line treatment. They have established efficacy in PHN with no difference being shown between gabapentin and nortriptyline. A Cochrane review demonstrated that both were more effective in treating PHN than placebo. Meta-analyses of trials of gabapentin or pregabalin have estimated that the NNT is 3 to 8 and the NNH is 7 to 32. Gabapentin is started at 300 mg daily and titrated to 1800 mg during a period of several weeks. Pregabalin is started at doses of 150 mg daily divided into two doses and titrated up to 600 mg within several weeks. Higher doses have been proven to be more effective at the cost of side effects, especially in the elderly. Lidocaine plasters (5%) are effective based on 5 class I or II RCTs in PHN, but the therapeutic gain is modest against placebo, and the level of evidence is lower than for systemic agents. Topical lidocaine, with its excellent tolerability may be considered first line in the elderly, especially if there are concerns regarding the CNS side effects of oral medications. In such cases, a trial of 2–4 weeks before starting other therapy is justified. A meta-analysis of small placebo RCTs suggested that the NNT for one person to obtain at least 50% pain relief is 2. It is sometimes used in combination with systemic drugs, although data are lacking, combining combination topical and systemic therapy with either therapy alone. Based on 2010 guidelines, opioids like oxycodone, morphine and methadone are considered as second line therapy. It has been proven they are effective in PHN treatment and have similar or slightly better efficacy compared to TCAs, although associated with more frequent discontinuation, due to side effects. Despite the fact that tramadol was effective on the primary outcome in one class I trial, a more recent systematic review and meta-analysis demonstrated a 13.4% improvement of PHN associated pain with tramadol, whereas in Greece, according to national Guidelines, tramadol is considered as first line treatment. Finally, regarding other topical treatments capsaicin cream is also recommended as second choice, as it seems to be more promising. A very recent Cochrane meta-analysis revealed that high concentration capsaicin plaster 8% generated more participants with moderate or substantial levels of pain relief than control treatment using a much lower drug concentration. However the long-term effects of repeated applications particularly on sensation are not clarified.
known as Lyme disease and is transmitted through tick bite. Stage 1 of the disease, which occurs up to 1 month from tick bite, is characterized by fever and erythema. In stage 2, the erythema persists and is associated with cardiac and neurologic manifestations (meningitis, cranial polyneuritis, polyradiculoneuritis, brachial and lumbar plexopathies), which resolve over a period up to 6 months. Stage 3 of the disease which occurs refers to years after the primary infection is characterized by arthritis, cerebellar ataxia, spastic paraparesis and painful peripheral polyneuropathy. Parenteral antibiotics are indicated in the initial stages of the disease. In most patients the neuropathy resolves in several months with antibiotic treatment. The precise indications for corticosteroids remain uncertain and their role in the treatment of painful polyradiculoneuropathy is unknown. Few studies suggest an efficacious role of gabapentin in the alleviation of symptoms in late Lyme disease.

CMV has been implicated in causing a, mononeuritis multiplex and a painful distal neuropathy in immune compromised patients. Treatment with iv ganciclovir and immune reconstitution, although efficacious, remains uncertain and prognosis is often poor. There are no data regarding special treatments for this type of neuropathic pain.

In relation hepatitis C infection, although some patients are asymptomatic, others may develop symptoms including arthralgias and peripheral neuropathy, possibly due to aoxonopathy of ischaemic origin. Treatment of symptomatic hepatitis C tradionally with steroids and recombinant interferon a2b might help, whereas gabapentin and oxcarbazepine seem promising agents.

Conclusion: NP as a manifestation of infectious disease is quite common. Painful syndromes may last during the acute illness or persist months or years after the initial attack. Consequently this group of disorders is rather variable in manifestations. While some of them have been extensively studied (PHN), other (neuroborreliosis or hepatitis C neuropathy) have many aspects to be elucidated, reflecting their impact on general population. Nevertheless, aggressive pain management should be an integral part of therapy along with the specific drugs. Clinicians should be more aware of the pain symptoms of patients and treat them accordingly.

References


REFRESHER COURSE 9: POST-CESAREAN SECTION ANALGESIA

ESRA7-0492

POST-CESAREAN SECTION ANALGESIA

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Analgesia after Cesarean Section (CS) should focus on pain free early ambulation, in order for the mother to be able to take care of her newborn infant(s). Proper pain relief, not only depending on opioids, will reduce the incidence of cardiorespiratory complications, not hinder gastrointestinal motility and benefit early mobility which reduces the incidence of thromboembolic complications. While adequate analgesia promotes the initiation of breastfeeding, it should not provide any risk for the nursed neonate. By questioning pregnant women about anesthesia preferences for CS, Carvalho demonstrated that both postoperative pain and potential harm to their neonates were major concerns.(1)

Severe postcesarean pain does not only delay recovery, it also seems to be related to the occurrence of Chronic Post-Surgical Pain (CPSP), with reported incidences between 1-18%.(2,4) CPSP is presumed to be the result of acute postoperative pain and surgical tissue damage, which promotes the release of a multitude of mediators. This results in peripheral neurotransmitter release from nociceptive fibers, which causes vasodilation and inflammation. The consequence can be secondary hyperalgesia and persistent chronic pain.(5)

Although many drugs and delivery modes exist to prevent the occurrence of acute postoperative pain after Cesarean Section, acute postoperative pain is far from gone. A recent German multicenter prospective cohort study demonstrated CS ranked in the Top 10 of most painful surgical procedures and that compared to hysterectomy patients, CS patients reported less analgesia and experience more acute postoperative pain.(6,7)

Patients/caregivers are often not aware of the importance and need for postcesarean analgesia and the available possibilities. In many countries no consensus and/or focused guidelines exist on postcesarean analgesia and a variety of postoperative analgesia strategies is used, from epidural or PCA opioid analgesia, to paracetamol and NSAID’s with only occasional provision of escape opioids.(8)

In countries with a tradition and practice of obstetric anesthesia, guidelines on post-cesarean analgesia recommend the use of NSAID’s (if non-contraindicated) and perioperative neuroaxial addition of long acting opioids, but evidence for intrathecal long-acting opioids are not considered for postoperative pain relief. (9–11) Compared to intravenous opioid Patient Controlled Analgesia (PCA) techniques, neuroaxial opioids provide superior pain control, do promote early mobilization and do not result in detectable maternal plasma levels.(12) Intrathecal (IT) morphine reduces the need for additional intravenous and oral opioids. The reluctance elsewhere to use intrathecal long acting opioids possibly originates from the time when high doses of morphine (~200) were used. Frequent side effects such as nausea, vomiting and itching occurred, and concerns existed (still exist) over late respiratory depression. Adaptation to lower doses of intrathecal morphine (0.1-0.2 mg) has resulted in an improved side effects profile without reducing analgesia, while incidence and severity can also be decreased by using available analgesics and opioid (ant)agonists.(13)

Several studies have demonstrated that the risk of respiratory depression is not increased with neuraxial compared to systemic administration of morphine, but adequate respiratory monitoring seems mandatory.(14) Recent updated ASA Practice Guidelines emphasize the importance of identifying patients at risk of developing disease, OSAS, cardiac disease, opioid use) and recommend measuring respiratory rate and depth till 24 hours after IT morphine.(15) Newer monitoring possibilities, focusing on end-tidal carbon dioxide monitoring and transcutaneous measurement of carbon dioxide levels, seem to be effective in detecting hypercapnia or hypercarbia, but have not been studied extensively yet.(15,16)

Multimodal analgesia components: Depending on available resources and preferences, other delivery routes can be used to provide postoperative analgesia with opioids, but systemic/oral opioids are less effective and are accompanied by more side effects than neuraxial administration, with potential risk of opioid addiction.(17,18)

An alternative non-opioid analgesics address different components of pain transmission and can be combined to provide additive and synergistic analgesia with good pain relief. The dose of each individual drug can be reduced, resulting in less side effects, less dependence on opioids and less drug transmission to the neonate through breastfeeding.

Paracetamol and NSAID’s provide an effective basis; when used together they produce an additive analgesia effect.(19) Although little evidence exists on the analgesic efficacy of paracetamol alone, it is considered safe to use: paracetamol has in the immediate post cesarean period a higher clearance and a larger distribution volume.(20) This may reduce potential concerns about any adverse effects of paracetamol in therapeutic doses.

All NSAID’s, including cyclooxygenase-2 (COX-2) inhibitors are effective in reducing opioid consumption after CS and are cheap and well tolerated by the breastfed infant.(21) Additionally, NSAID’s are more effective than opioids to treat uterine cramping and the visceral component of post-cesarean pain. Recent interest in the use of gabapentin for postoperative analgesia has not been translated to use in post-cesarean analgesia. The results from post-cesarean analgesia studies have not been consistent.(22,23) Dexamethasone (DXM) is often used as antiemetic perioperative, but has some analgesic properties as well, compared to placebo.(24) Ketamine, an anesthetic that acts as a N-Methyl-D-Aspartate (NMDA) receptor antagonist reduces opioid use in sub-anesthetic doses: side effects seem limited, although dizziness, visual disturbances and disturbing dreams have been reported.

The analgesic effect of several drugs like clonidine and neostigmine added to neuraxial analgesia has been studied, but evidence is inconclusive and/or side effects prevent widespread adaptation.

Epidural catheters left in place after CS can be used to deliver local anesthetic (LA) analgesia. Though providing excellent analgesia, the accompanying muscle weakness prevents early maternal ambulation. While single shot local wound infiltration with local anesthetics does not last long enough to achieve adequate postoperative analgesia and reduce opioid use, wound catheters delivering LA continuously in the surgical wound area can provide adequate analgesia with a reduction of opioid use in obstetric patients, although the results are not unanimously positive.(28)

Regional anesthesia techniques targeting the abdominal wall have been developed.

The Transversus Abdominis Plane (TAP) block targets the segmental nerves Th 6-L1. Bilateral injection of LA in the fasicplane between the internal oblique and transversus abdominis muscles will anesthetize the
lower anterior abdominal wall where the surgical wound is located. Initial studies demonstrated reduced pain scores and opioid usage, but only in absence of IT morphine. Different approaches to the Transversus Abdominis Plane exist: in a recent meta-analysis Abdallah demonstrated a more prolonged analgesia achieved with the posterior approach when compared to the lateral approach. (29) This is considered to be the result of a more retrograde LA spread reaching the paravertebral plane (potentially blocking sympathetic nerve fibers) and inclusion of lateral cutaneous branches of the thoracolumbar nerves.

These observations have recently led to the development of the Quadratus Lumbrorum (QL) Block, which allows LA spread posterior to the Quadratus Lumbrorum Muscle into a triangular lumbar interfascial space, with connection to sympathetic fibers and the paravertebral space. The first and until now only study comparing TAP and QL blocks in CS demonstrated significant less morphine use with the latter, but further research is needed to determine the precise contribution of these blocks in postcesarean analgesia. (30)

References

SYMPOSIAS 9: NEW TRENDS AND TARGETS IN TREATING LUMBOSACRAL AND PELVIC RELATED PAIN

ESRA7-0151

INGUINAL PAIN: ANALYSING ITS ETIOLOGIES AND UPDATED MANAGEMENT

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Chronic pain after inguinal hernia repair is prevalent and can be disabling. The most accepted explanation is nerve lesion leading to neuropathic pain. However, signs of nerve lesion are not constant in patients with pain, and neurological deficits in the groin are frequent in patients with no pain after surgery. Possibly, damages of deep nerves that are not detected clinically play a role, but this remains speculative. Ongoing sub-clinical inflammation of deep tissues is an alternative explanation, but again evidence is lacking. Studies using quantitative sensory tests (QST) are suggestive for central sensitization that may amplify the nociceptive signal arising from peripheral structures.

To the author’s knowledge, there are no high-quality trials on the treatment of chronic inguinal pain after surgery. Because of the suspected neuropathic nature, antidepressants, anticonvulsants, lidocaine patch and topical capsaicin may be effective. Anesthetic blocks of the ilioinguinal and iliohypogastric nerve arm at reducing nerve excitability, but evidence for their efficacy is lacking. In highly selected cases, spinal cord stimulation or peripheral nerve stimulation may be considered, but the risk/benefit ratio is unclear. Surgical neurectomy has some evidence of efficacy, but the quality of the literature is modest. As for chronic pain management in general, there should be considered whenever appropriate, but the author is not aware of studies investigating the treatment of such co-morbidities in this patient population.

Due to the magnitude of the problem and the many areas of uncertainty, chronic pain after inguinal hernia repair requires more research on mechanisms and treatments.
SYMPOSIA 10: COMPLICATIONS OF REGIONAL ANAESTHESIA
ESRA7-0573
TRICKS AND TIPS TO PLACE AND MAINTAIN PERINEURAL CATHETERS AND AVOID COMPLICATIONS
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Catheters for regional anesthesia are often used for different indications (1). One should always consider critically if the use catheter is indicated or could an alternative technique be used. Catheters may be dislodged because of insufficient fixation or due to patient movements. The incidence of catheter dislodgement varies in the literature between “rare” (1) and 40% (2). In our institute we have found even greater incidence of catheter dislodgement (more than 50%) in the hip fracture patients who received a preoperative femoral nerve block catheter for analgesia. Insufficient analgesia may also due to inaccurate catheter placement resulting unsuccessful analgesia (primary failure).

There are no good large studies comparing different catheter fixation techniques or catheter types and dislodgement incidences. The catheter can be fastened to the skin with suture to keep it in place and then bandaged as necessary. However, suturing or even tunnelling the catheter does not guarantee that the incidence of dislodgement decreases. Also there is a greater risk for tissue damage if sutures or tunnelling is used. Local anesthetic leakage away from the nerve may also cause catheter failure. In most catheter types, needle is thicker than the catheter producing larger puncture site than the catheter. The leakage can be prevented with occlusive dressing or by using topical skin adhesive (Histoacyl®). Indications for catheter use (1)
• Continuous regional analgesia
• Acute pain therapy (postoperative)
• Management of chronic pain (CRPS)
• Supportive adjunct to physiotherapy/exercise therapy
• Sympatholysis (for improving wound healing)
• Preventive analgesia (phantom pain prophylaxis)

References

SYMPOSIA 10: COMPLICATIONS OF REGIONAL ANAESTHESIA
ESRA7-0515
PERFORMING PERIPHERAL NERVE BLOCKS: PRACTICAL APPROACH
Sermeus L. Camerlynck H. Morrison S. Antwerp University Hospital, Anaesthesia, Edegem, Belgium.

In 1994, S. Kapral was the first to describe the use of ultrasound for detec-
ting nervous structures and to visualize the injection of local anesthetic solution around the divisions of the brachial plexus, in a suprACLavicular nerve block. This study demonstrated the principle advantages of using ultrasound when performing a peripheral nerve block, namely:
1. The anatomy can be confirmed with ultrasound and variations or abnormalities can be detected.
2. The puncture site can be determined for a safer and simpler approach.
3. The needle can be visualized in real-time when directed at the nerve, avoiding other anatomical structures.
4. The needle can be placed close to the nerve at the correct injection site.
5. The spread of the local anesthetic can be evaluated and the needle repositioned if an incorrect spread is observed.

Paradoxically, ultrasound-assisted visualization of structures during RA has made the knowledge of anatomy even more important, as nerves can be seen easily and their correct identification becomes a priority.

Unfortunately, the notion that ultrasound, with the above-mentioned advantages, would resolve all of the difficulties in performing peripheral nerve blocks (PNB), was an illusion and the limitations of the technique quickly became apparent. The belief that ultrasound could decrease or even abolish direct needle trauma to the nerve, by means of direct observation of structures during needle advancement in real time, has not been upheld. Regardless of the technique used, a nerve lesion, even if quite rare, might have terrible consequences for the patient. To date, it has not been possible to prove that the use of ultrasound decreases the risk of nerve lesions induced by direct needle trauma. The main reason for this is the difficulty in performing a sufficiently powered prospective randomized controlled trial that would require enrolment of thousands of patients. Nevertheless, with this in mind, researchers all over the world have tried to find a technique that reduces the likelihood of nerve lesions.

One of the most important limitations of ultrasound relates to the resolution of the displayed image. Difficulties may arise in determining the exact boundaries of the observed nerve. This therefore begs the question: how close can local anesthetic solutions be administered without either the inherent risk of nerve trauma or intra-nerve injection? Researchers have looked for techniques that avoid accidental intra-nerve injections. A safety algorithm has been produced in which it is recommended that a low current peripheral nerve stimulator should be used to avoid intra-nerve needle tip positioning and a pressure monitoring device used to detect potential intra-fascicular injection. Moreover we introduced an ultrasound-guided tangential (as opposed to direct) approach to the nerve to reduce the risk of sub-epineural injection. However, the use of these two devices, and this tangential approach, together with ultrasound and short bevel needles, failed to avoid intra-nerve injection in all cases, although it aimed to reduce the incidence to a minimum. The problem here relates to statistical analysis. Demonstrating a superior safety profile for one technique over another is difficult if the outcome measure i.e. nerve lesions, only occurs very rarely. Moreover, Bigeleisen has demonstrated that intentional intra-nerve injections do not always lead to nerve lesions, although he conceded in his conclusions that his study was underpowered. This implies that although intentional intra-nerve injection should be avoided in clinical practice, an accidental intra-nerve injection need not unduly stress the clinician. The reason for this is that not all nerve structures are implicated in the conduction of impulses. Furthermore, the absence of detectable functional change does not exclude the presence of histological damage. Perforation of the epineurium with subsequent sub-epineural injection into the connective tissue does not usually lead to severe nerve damage, but rather gives rise to minor transient neurologic symptoms, which resolve in a few weeks. In some cases, lesions arise through needle damage to the nerve’s blood supply resulting in ischemia or compressive herniation, both of which can alter conduction. Sub-epineurally injected LA volume may also compress the extrinsic, as well as the intrinsic, vascular system and this could adversely affect nerve perfusion.

The perineurium, however, is a tough and resistant structure, unlikely to be perforated by a short bevel needle. If this occurs, the trauma caused by the needle directly affects the axons, causing axonotmesis (loss of axonal continuity). Injection of LA into the fascicle surrounded by this tough perineurium may lead to compression of all neural structures and compromise the intrinsic blood supply. Together with direct needle trauma, this will most probably result in severe neurologic deficit. It should be added, however, that very high pressure is required in order to inject within the perineurium.

Indirectly, LA toxicity, either with or without adjuvants, may impair neural conductivity. This may occur when a pre-existing neural pathology enhances the risk for neurotoxicity, such as in diabetic patients or following chemotherapy. Epinephrine, sometimes used as an adjuvant in LA solutions, seems to cause a dramatic reduction in neural blood flow.

Besides these specific safety procedures for avoiding intra-nerve injection, clinical recommendations for a good and safe practice when performing peripheral nerve blocks have to be applied. These guidelines deal with “Informed Consent”, preoperative visit, properly equipped area, monitoring, equipment, sterility and hygiene, resuscitation medication (Lipid rescue).

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Anesthesia 2017; Apr;72(4):461–469
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SYMPOSIA 11: ANALGESIA IN LABOR
ESRA7-0474
MODERN NEURAXIAL LABOUR ANALGESIA

Epidural analgesia (EA) is the most efficient technique for labour pain relief.1 During the last decades, many improvements in EA occurred.
The co-administration of a lipophilic opioid and a local anaesthetic (LA) allows the decrease of LA concentrations. Sultan et al. have demonstrated in a meta-analysis that low (versus high) anaesthetic concentrations provide similar pain scores with less motor blockade, less instrumental delivery although no difference in caesarean section rate. During EA lasting more than 4 hours, motor blockade occurs more often with bupivacaine than with ropivacaine or levobupivacaine at equipotent concentrations. Conversely, ropivacaine and levobupivacaine provide similar analgesia without difference in motor blockade and obstetric outcomes. Simmons et al. found in a meta-analysis that combined spinal epidural (CSE) technique permitted a reduction of 3 minutes of analgesia onset but was not superior to EA alone for maternal satisfaction, rate of caesarean section and neonatal outcome. Recently, one study showed that dural puncture without intra-thecal injection did not speed up the onset of analgesia compared with EA but provided a better analgesic sacral blockade with fewer side effects than CSE. After the analgesia onset, the Programmed Intermittent Epidural Boluses (PIEB) with Patient-Controlled Epidural Analgesia (PCEA) provides a better epidural diffusion of LA solution, in comparison with Continuous Epidural Infusion with PCEA. PIEB with PCEA reduces the total dose of LAs and motor blockade with increased maternal satisfaction. In conclusion, modern neuraxial labour analgesia involves the use of a low concentration of ropivacaine or levobupivacaine with a lipophilic opioid (fentanyl or sufentanil) administered by PIEB and PCEA to minimise motor blockade. The additional use of a dural puncture with (~ CSE) or without intra-thecal injection is still debated.

References
6. Purdie G, McGrady EM: Comparison of patient-controlled epidural bolus administration of 0.1% ropivacaine and 0.1% levobupivacaine, both with 0.002% fentanyl, for analgesia during labour. Anaesthesia 2004; 59:133–7.

SYMPOSIUM 13: EDUCATION IN REGIONAL ANAESTHESIA

ESRA7-0484

PROFICIENCY BASED TRAINING IN REGIONAL ANAESTHESIA

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Training for procedural skills is largely based on the Halstedian apprenticeship model from the early 1900’s. Assessment of procedural skill still subjective. Robust systems exist to evaluate the knowledge aspects of a trainee’s education but no such system exists to objectively evaluate a trainee’s procedural skills.

Simulation studies in anaesthesiology over a decade (2001–2010) has shown that simulation training in anaesthesiology is now widely accepted. Although simulation training offers many benefits in procedural skill training, there is still limited evidence to show the transfer of trained skills or positive impact on quality and safety of patient care. There is also insufficient evidence on the effects of simulation training on patient outcomes.

“One proficiency based progression” (PBP) differs from current simulation training methods in that it combines simulation training with proficiency benchmarks. The first study on proficiency based simulation training was performed by Seymour NE which was followed by multiple other studies. Studies on acquiring arthroscopic Bankart skill set have shown that PBP is superior to traditional and simulator enhanced training methods. In PBP, the trainees are not allowed to progress to the next training stage until they demonstrate “proficiency” in a simulated setting on par with experts in the field. This "proficiency" benchmark is derived from mean performance score of experts who are evaluated based on validated metrics that characterise the procedure. This lecture will aim to explore this concept in detail and discuss its application in anaesthesia.

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Seventy-two patients scheduled for arthroscopic shoulder surgery after scientific ethical approval, we included and randomised 60 patients. The primary outcome was the time to the first report of postoperative pain at the surgical site. The secondary outcomes were 24-h cumulative postoperative opioid consumption, motor block duration, pain scores and side effect.

**Results:** The duration of analgesia (mean [95% confidence interval]) was significantly prolonged in the DEX 2.0 group (1295 min [658.3-1932.7]) compared with the control group (661.3 min [592.0-730.5]; P<0.018), but similar to the DEX 0.5 group and DEX 1.0 group. There were no significant differences on motor block duration, pain scores and side effects.

**Conclusions:** The effective dose of intravenous dexmedetomidine for prolonging the duration of analgesia without clinically intolerable side effect was 2.0 μg/kg.

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**BEST FREE PAPERS**

**ESRA7-0085**

**EFFECTIVE DOSE OF IV DEXMEDETOMIDINE TO PROLONG THE ANALGESIC DURATION OF INTERSCALENE BRACHIAL PLEXUS BLOCK; A SINGLE-CENTER, PROSPECTIVE, DOUBLE-BLIND, RANDOMIZED CONTROLLED TRIAL**


**Background and Aims:** IV dexmedetomidine (DEX) prolongs the analgesic duration after single-shot interscalene brachial plexus block (ISBPB). However, the effective dose of IV DEX remains poorly understood. We aimed to define the appropriate dose of IV DEX to prolong the analgesic duration of ISBPB.

**Methods:** Seventy-two patients scheduled for arthroscopic shoulder surgery were randomly assigned to receive 15 ml ropivacaine 0.5% of one of three groups: (1) IV normal saline (control), (2) IV dexmedetomidine 0.5 μg/kg (DEX 0.5), (3) IV dexmedetomidine 1.0 μg/kg (DEX 1.0), (4) IV dexmedetomidine 2.0 μg/kg (DEX 2.0). The primary outcome was the time to the first report of postoperative pain at the surgical site. The secondary outcomes were 24-h cumulative postoperative opioid consumption, motor block duration, pain scores and side effects.

**Results:** The duration of analgesia (mean [95% confidence interval]) was significantly prolonged in the DEX 2.0 group (1295 min [658.3-1932.7]) compared with the control group (661.3 min [592.0-730.5]; P<0.018), but similar to the DEX 0.5 group (670 min [592.7-747.3]; P>0.999) and DEX 1.0 group (664.3 min [582.8-745.9]; P>0.999). Postoperative cumulative 24-h oral morphine equivalent consumption and intraoperative remifentanil consumption was significantly lower in the DEX 2.0 group compared with the control group, but similar to the DEX 0.5 group and DEX 1.0 group. There were no significant differences on motor block duration, pain scores and side effects.

**Conclusions:** The effective dose of intravenous dexmedetomidine for prolonging the duration of analgesia without clinically intolerable side effect was 2.0 μg/kg.

**BEST FREE PAPERS**

**ESRA7-0136**

**VOLUME OF ROPIVACAINE 0.2 % AND SCIATIC NERVE BLOCK DURATION: A RANDOMISED, BLINDED DOSE-RANGING TRIAL IN HEALTHY VOLUNTEERS**


**Background and Aims:** Local anaesthetic (LA) volume necessary for a successful nerve block has decreased with advancements in ultrasound (US) guided techniques. Lowering LA volume may however reduce block duration, but the extent of this is unknown (1). The aim of this study was to determine the relationship between LA volume and peripheral block duration. We hypothesised that increasing LA volume would prolong block duration.

**Methods:** After scientific ethical approval, we included and randomised 60 healthy volunteers to US guided infragluteal sciatic nerve blocks with 5, 10, 15, 20 or 30 mL ropivacaine 0.2 %. Volunteers and investigators were blinded to group assignments. We used a catheter-based technique to optimise blinding and to ensure a constant infusion rate of 10 mL per minute. Primary outcome: Duration of sensory block defined by insensitivity towards cold. Secondary outcome: Duration of motor block. We tested every hour from onset of nerve block to complete remission. We used ANOVA for analysing the effect of LA volume on block duration.

**Results:** Fifty-eight out of 60 volunteers had successful nerve block. Sensory block duration ranged from 6 to 17 hours. There was no significant effect of LA volume on either sensory or motor block duration. The variability of both sensory and motor block duration was high and did not decrease with increasing LA volume (Fig. 1 and 2).

**Conclusions:** We could not detect a significant effect of LA volume on sciatic nerve block duration. This contrasts previous findings from studies investigating dose response relations and duration of sciatic nerve block (2).

**BEST FREE PAPERS**

**ESRA7-0434**

**DEVELOPMENT AND EVALUATION OF ELASTIC LIPOSOME BASED TOPICAL GEL OF DIFLUNISAL FOR TREATMENT OF HYPERALGESIA IN MURINE MODEL**

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LA volume on either sensory or motor block duration. The variability of both sensory and motor block duration was high and did not decrease with increasing LA volume (Fig. 1 and 2).

**Conclusions:** We could not detect a significant effect of LA volume on sciatic nerve block duration. This contrasts previous findings from studies investigating dose response relations and duration of sciatic nerve block (2).
Background and Aims: Diflunisal is a potent salicylic acid derivative, indicated for treatment of pain and inflammation associated with rheumatoid arthritis, osteoarthritis and post episiotomy pain. The oral administration leads to severe gastrointestinal side effects. The aim of the current proposal is to develop an elastic liposome based topical gel of diflunisal to improve its delivery and efficacy.

Methods: Elastic liposomes of diflunisal were developed by thin film hydration method. The elastic liposomes were characterized for vesicle size, morphology, degree of elasticity, zeta potential, stability, rheology, texture etc. The ex vivo permeation across mice skin, histopathological investigations and in vivo therapeutic activity assessment for antihyperalgesia was studied using formalin induced hyperalgesia murine model. The protocol of study was duly approved (PU/IAEC/S/14/57) dated 29.10.2014.

Results: The developed elastic liposomal vesicles were spherical and multilamellar in nature (Figure 1) with a particle size of 119.5 nm and PDI of 0.338. The percentage entrapment efficient of diflunisal was 81.45%. The ex vivo permeation across mice skin was 110.56 ± 3.45 μg/cm². The effective skin penetration of rhodamine 123 labelled elastic liposomes was confirmed by confocal laser scanning microscopic studies (Figure 1). Histopathological study depicted the dermal safety of developed gel (Figure 1). Dermatokinetic studies across rat skin depicted effective concentration of diflunisal in skin as quantified by HPLC analysis. The antihyperalgesia was demonstrated by decrease in paw licking time and biting time in rats treated with diflunisal gel (Figure 2).

Conclusions: The developed elastic liposome based topical gel was promising in effective pain relief in case of chronic inflammatory conditions.

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ESRA7-0127
APPLICATION OF DEXMEDETOMIDINE AS PERIPHERAL NERVE BLOCK ADJUVANT IN ADDUCTOR CANAL AND SCIATIC NERVE BLOCKADE: A PROSPECTIVE, RANDOMIZED, DOUBLE-BLINDED, CONTROLLED TRAIL
Shen Y., Lan F., Xue J., Wang T. Xuan Wu hospital- Capital medical university; Department of Anesthesiology; Bei Jing, China.
Background and Aims: Similarly to clonidine, dexmedetomidine is a selective α2-adrenoceptor agonist that could reduce onset time and prolong duration. Adductor canal block (ACB) is sole sensory nerve block that preserves quadriceps strength. In this study, we investigated the application of dexmedetomidine as adjuvant in ACB and sciatic nerve blockade (SNB) during lower leg trauma surgery. We hypothesized that adding dexmedetomidine in ACB and SNB would provide longer analgesia, defined as a difference of delaying breakthrough pain (0–10 numeric rating scale [NRS]) on movement.

Methods: After obtaining institutional ethics committee approval of Xuanwu Hospital, Capital Medical University and registering at Chictr.org.cn, twenty patients were included in this randomized double-blind controlled trial. All patients experienced lower leg trauma surgery under ultrasound-guided ACB and SNB. Patients were randomly allocated into two groups with different local anesthetics, Group D (0.4% ropivacaine with 1 μg/kg dexmedetomidine) or Group R (0.4% ropivacaine). The primary outcome was occurrence time of breakthrough pain (NRS>3) on movement.

Results: Breakthrough pain on movement occurred significantly later in Group D (mean T ± SD, 18.78±1.92 vs 14.18±2.86; P=0.001). Duration of blockade were longer in Group D (mean NRS ± SD, 20.44±3.13 vs13.64±3.26; P=0.001). Opioid consumption during postoperative 48 hours were significantly less in Group D. All patients in both groups could extent knee joints on the day of surgery and no significant differences were found in quadriceps strength at postoperative 2 days.

FIGURE 1.

Comparison of hours occurred breakthrough pain (NRS>3) and duration after blockade(*P<0.001).

FIGURE 2.

Comparison of opioids consumption during surgery and postoperative 48h(*P<0.05)
Conclusions: Adding dexmedetomidine in local anesthetics for adductor canal and sciatic nerve blockade could provide longer analgesia.

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ESRA7-0317

DIFFERENCE IN BLOCK SUCCESS BETWEEN DIFFERENT APPROACHES OF THE FASCIA ILIACA COMPARTMENT BLOCK IN HEALTHY VOLUNTEERS


Background and Aims: The Fascia Iliaca Compartment block (FICB) aims to block the femoral (FN), obturator (ON) and lateral femoral cutaneous nerve (LFCN). Clinical and anatomical studies have shown that the transverse infrainguinal approach (T-FICB) does not reliably block all three target nerves. With a supra-inguinal longitudinal approach (SI-FICB), local anaesthetics are injected more proximally to the lumbar plexus. We hypothesized that a SI-FICB more reliably blocks the FN, ON and LFCN than a T-FICB.

Methods: After IRB approval, 10 volunteers received bilateral T-FICB with 40mL lidocaine 0.5%. All volunteers were randomized and simultaneously received a T-FICB and, on the contra-lateral side, a SI-FICB. Evaluation of sensory block in the different nerve territories was performed one hour after performance of the block using ice cube testing. An investigator blinded for randomization conducted all testing. Statistical analysis was performed using Fisher Exact tests.

Results: Results of sensory block in the different nerve territories are presented in Table 1. With a SI-FICB 8/10 volunteers had a complete sensory block of the three target nerves, whereas this was only the case in 3/10 with the T-FICB (p=0.035).

<table>
<thead>
<tr>
<th>Level</th>
<th>SI-FICB Frequency</th>
<th>T-FICB Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>L2</td>
<td>8/10</td>
<td>4/10</td>
</tr>
<tr>
<td>L2-L3</td>
<td>7/10</td>
<td>4/10</td>
</tr>
<tr>
<td>L3</td>
<td>5/10</td>
<td>3/10</td>
</tr>
<tr>
<td>L3-L4</td>
<td>9/10</td>
<td>4/10</td>
</tr>
<tr>
<td>L4</td>
<td>7/10</td>
<td>5/10</td>
</tr>
<tr>
<td>L4-L5</td>
<td>0/10</td>
<td>6/10</td>
</tr>
</tbody>
</table>

Conclusions: Our data shows the line connecting the ASISs, identifies the L4 SP and L4/L5 VIS more accurately than TL. Its closer location to the fulcrum of the pelvis may mean it is less vulnerable to varying degrees of lumbar flexion and pelvic tilt. The ASIS appears to be a promising alternative to TL, as a landmark for central neuraxial blockade.

BEST FREE PAPERS

ESRA7-0084

THE ANTERIOR SUPERIOR ILIAC SPINES AS A LANDMARK FOR NEURAXIAL blockade. AN ULTRASOUND EVALUATION IN AN OBSTETRIC POPULATION

Hartopp A.1, Peerless J.2, Begum S.3, Nguyen-Lu N.1,1/ Guy’s and St Thomas’ Hospital, Anaesthetics, London, United Kingdom, 2/ Division of Women’s Health, King’s College London, London, United Kingdom.

Background and Aims: Tuffier’s line (TL) identifies the L4 spinous process (SP) or the L4/L5 vertebral interspace (VIS) to facilitate safe neuraxial blockade. Yet this historical teaching is far from robust. Anatomically, TL moves cephalad during pregnancy. Hence an identical landmark to the non-parturient seems illogical. Studies show that even experienced clinicians are unable to reliably identify the lumbar interspaces correctly using TL. The authors postulate whether the line joining the anterior superior iliac spines (ASIS) may provide a safer alternative to TL.

Methods: A pre-operative ultrasound evaluation of the lumbar spine was performed in 29 term parturients, after informed consent was obtained. Two anaesthetists scanned the lumbo-sacral spines in a sitting position. The centre of each VIS from L2/L3 to L5/SI was marked. The VIS or SP that was transected by TL was recorded. This was repeated using the line connecting the ASISs.

Results: 29 patients were evaluated, whose BMI ranged from 19-45kg/m2. Wilcoxon signed-rank test showed the ASIS technique identified the L4 SP and L4/L5 VIS more accurately than TL (65.5% vs 24.1%; p=0.001).

Conclusions: This volunteer study demonstrates that a longitudinal supra

TABLE 1. Frequency of which vertebral SP or VIS was transected by TL or the line connecting the ASISs.

<table>
<thead>
<tr>
<th>Level</th>
<th>Frequency for TL</th>
<th>% of TL</th>
<th>Frequency for ASIS</th>
<th>% of ASIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>L2</td>
<td>8</td>
<td>27.6</td>
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<td>0</td>
</tr>
<tr>
<td>L2-L3</td>
<td>7</td>
<td>24.1</td>
<td>13</td>
<td>44.8</td>
</tr>
<tr>
<td>L3</td>
<td>4</td>
<td>13.8</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>L3-L4</td>
<td>9</td>
<td>31.0</td>
<td>10</td>
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<td>L4</td>
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<td>L4-L5</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>20.7</td>
</tr>
</tbody>
</table>

Conclusions: Our data shows the line connecting the ASISs, identifies the L4 SP and L4/L5 VIS significantly more accurately than TL. Its closer location to the fulcrum of the pelvis may mean it is less vulnerable to varying degrees of lumbar flexion and pelvic tilt. The ASIS appears to be a promising alternative to TL, as a landmark for central neuraxial blockade.

BEST FREE PAPERS

ESRA7-0291

BREAKTHROUGH PAIN DURING LABOR: CONVENTIONAL PATIENT CONTROLLED EPIDURAL ANALGESIA WITHOUT BACKGROUND INFUSION VS PROGRAMMED INTERMITTENT EPIDURAL BOLUSES: A RANDOMIZED, DOUBLE BLIND STUDY IN NULLIPAROUS WOMEN

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Background and Aims: Compared to continuous epidural infusion (CEI) with or without patient controlled epidural analgesia (PCEA), labor analgesia with programmed intermittent epidural boluses (PIEB) results in less local anesthetic (LA) consumption, less PCEA requests, less motor block, less instrumental deliveries, higher maternal satisfaction and less anesthetic interventions. (1) A comparison between PIEB and PCEA without CEI is not yet published. This prospective, randomized, double-blind study compares PIEB or PCEA labor analgesia in nulliparous women.

Methods: Following ethical approval and written informed consent, a CSE in 130 term, nulliparous women was performed. Analgesia was maintained with ropivacaine 0.120% and sufentanil 0.75mg/mL. Patients were randomized to receive either PIEB (10 mL/h, first bolus 30 minutes) or PCEA (5 mL bolus/20’) or PCEA (5 mL bolus/12’). Breakthrough pain was defined as pain with a VAS score of ≥30 and was treated with a manual bolus of 8mL. The primary outcome variable was breakthrough pain. Pain and satisfaction scores, motor block, LA consumption, PCEA boluses, duration of labor, mode of delivery and neonatal outcome were secondary outcomes.

Results: 130 women were studied, 4 were excluded (PIEB n=64; PCEA n=62). Breakthrough pain was reported in 11% in the PIEB group versus 63% in the PCEA group (P<0.001). Motor block was equal in both groups. Satisfaction and neonatal outcome were secondary outcomes.

Conclusions: Maintenance of epidural analgesia during labor with PIEB compared with PCEA without background infusion resulted in a significantly lower incidence of breakthrough pain.

FREE PAPER SESSION 1: CENTRAL NERVE BLOCKS

ESRA7-0336

WHAT IS THE OPTIMAL DOSE OF INTRATHECAL MEPERIDINE IN OPEN PROSTATE SURGERY?

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This study was approved by the Ethics Committee of Atatürk University, Department of Anesthesia and Reanimation, Erzurum, Turkey.

Background and Aims: The objective of this randomised study was to determine the optimal dose of intrathecal mepivacaine that produces satisfactory analgesia with minimum side effects in patients undergoing open prostate surgery.

Methods: This study was approved by the Ethics Committee of Atatürk University, Medical Faculty, Erzurum, Turkey. Sixty patients of age 18-65 years with ASA I or II physical status who underwent open prostate surgery with combined spinal-epidural anesthesia (CSE) were included. Patients were allocated to receive one of four doses of intrathecal mepivacaine (n=15, for each group): Group I: 40 mg, Group II: 50 mg, Group III: 60 mg, Group IV: 70 mg. Sensory and motor block levels were tested every 5 min before, during, and after surgery.

Results: There were no significant differences among groups in terms of demographic data and duration of surgery (p > 0.05). At 20 minutes after spinal injection, maximum sensory block level was T₆ in groups I and II and it was T₅ in groups III and IV. Duration of analgesia was found to be lower in group I compared with other groups (p < 0.001). Motor block duration was significantly shorter in groups I and II than in the groups III and IV (P < 0.001, for all). There were no differences among groups as regards mepivacaine-related side effects, including hypotension, bradycardia, nausea-vomiting, shivering and pruritus.

Conclusions: Intrathecal mepivacaine at a dose of 60 mg exerts a sufficient analgesic effect with minimum side effects for patients undergoing open prostate surgery.

FREE PAPER SESSION 1: CENTRAL NERVE BLOCKS

ESRA7-0378

PERINEURAL DEXAMETHASONE AS AN ADJUVANT IN BRACHIAL BLOCK ANAESTHESIA FOR CREATION OF ARTERIOVENOUS FISTULAE

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Background and Aims: Surgical creation of arteriovenous fistula is Dialysis Outcome Quality Initiative for ESRD patients. Regional anesthesia improves pain relief and patency of fistula created under USG-guided brachial plexus block analgesia. We studied effect of local anaesthetics with or without perineural dexamethasone in these patients.

Methods: Prospective, randomized, double blind study enrolled sixty-six patients, either gender, ASA III/IV scheduled for arteriovenous fistula creation. Randomly received either RL (N=33; Ropivacaine 0.5%, Lignocaine 2% with 2 ml of saline) or RLD (N=33; Ropivacaine 0.5%, Lignocaine 2% and 2mg of dexamethasone diluted in 2ml of saline). The sensory and motor blockade and duration noted for 24 hours. The time to first and subsequent analgesic requests (VAS >4) was recorded. The measurements for blood flow at three months after the surgery to assess the patency of the fistula.

Results: All the BPB were effective. Sensory & motor block was faster in RLD group (5.3 versus 6.2 minutes; 3.2 versus 6.7 minutes and duration significantly prolonged (P = 0.00). Time for first analgesic request and overall analgesic consumption less in RLD. In the RL group 5 patients required a rescue analgesia. Mean flow rates was 661 ml/min. (P=0.891) Six patients didn’t report at three months and only three fistulae were nonfunctional.

Conclusions: Dexamethasone 2mg is a useful adjuvant to local anaesthetics. It provided prolonged analgesia without weakness, delayed the time to first analgesic request and overall reduced analgesic consumption. Larger trials regarding role of dexamethasone in enhancing maturation and patency of AVF are needed.

FREE PAPER SESSION 1: CENTRAL NERVE BLOCKS

ESRA7-0172

MIDAZOLAM AS ADJUVANT TO CAUDAL LEVOBUPIVACAINE VERSUS LEVOBUPIVACAINE ALONE FOR POSTOPERATIVE ANALGESIA IN PEDIATRIC HERNIOTOMIES AND HEMODYNAMIC CHANGES EVALUATION

Galante D., Badili F., Melai E., Pedrotti D., Lambo M.S., Belpiede C., Aromatico C., Cococita L. University Hospital Ospedali Riuniti di Foggia.

Background and Aims: Midazolam as adjuvant in caudal epidural anesthesia is effective and has been described in adults. This study was performed to evaluate its analgesic efficacy and safety in pediatric patients who underwent herniotomies.

Methods: A systematic multicentric review of our recorded data was analyzed after ethics committee approval. 72 children aged between 1 and 8 years scheduled for herniotomies were randomized to receive either a caudal epidural injection of levobupivacaine (1ml/kg of 0.25%) alone (group B), or with 50μg/kg of midazolam (group M) after sedation with a mixture of AirO₂ and sevoﬂurane via an airway mask or proximal laryngeal mask airway. Postoperatively, time to first analgesia, number of rescue doses of analgesic drugs (paracetamol) administered within the first 24 hours and sedation scores within the first hour were recorded.

Results: The mean time to first rescue dose of analgesic was signiﬁcantly longer (p = 0.0001) in group M (478.47 min ± 51.68 min) compared to group B (239.48 min ± 41.00 min). The number of rescue doses of analgesic drugs during the postoperative time was lower in the study group (p = 0.0001). Sedation scores were similar in both groups in the first hour. The time to home readiness was longer in the midazolam group with a mean difference of 5.27 minutes (38.55 min ± 6.21 min versus 33.37 ± 4.44 min; p = 0.0001) (Figure 1).

Conclusions: Our research demonstrated that caudal anesthesia with levobupivacaine and midazolam as adjuvant provide greater efﬁcacy and duration of analgesia in pediatric patients compared to levobupivacaine alone.

FREE PAPER SESSION 1: CENTRAL NERVE BLOCKS

ESRA7-0313

COMPARISON OF THE EFFECTS OF THORACIC EPIDURAL ANALGESIA IN DIFFERENT LEVELS ON INTRAOPERATIVE HEMODYNAMICS IN ABDOMINAL SURGERY.

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Background and Aims: Our primary aim is to investigate and compare cardiovascular parameters and maximum spinal segment number that are blocked for old patients who are planned to have upper abdominal surgeries and who takes epidural analgesia at different levels.

Methods: This study is made with 60 patients, who are more than 65, planned for an upper abdominal surgery. Epidural catheter is placed to one group of patients from T₆-7 intervertebral space and it is placed to another group of patients from T₉-10 intervertebral space.Hemodynamic data of the patients is measured; before the epidural catheter as (T₉₋₁₀), in 5th (T₅₋₁₀), 10th (T₅₋₁₀), 15th (T₅₋₁₀), 20th (T₅₋₁₀), 25th...
Brachial plexus block is a well-defined and continuously extracting quantitative features from each 2D optical coherence tomography (OCT) image as the needle tip was progressively inserted from the skin surface toward the epidural space (ES), the differentiation of the needle tip inside of the ES or outside of the ES was automatically evaluated by an automatic identification algorithm to objectively identify the position of the epidural needle tip and thus intelligently guide the epidural anesthesia procedure. 200 in vivo images were obtained from 3 anesthetized piglets. Results show this method was found to yield high sensitivity (95%), specificity (93%), and accuracy (94%).

Conclusions: We anticipate that this intelligent image-guiding system will improve the accuracy of epidural placement and therefore reduce medical complications associated with neuraxial blockade. Further clinical studies are needed to validate this preliminary animal study.

Conclusions: Injection into the distal part of the adductor canal spreads into the popliteal fossa and colors the popliteal plexus and the posterior obturator nerve, as opposed to injection into the femoral triangle.

The aims of this study were (1) Assessment of the spread of dye to the popliteal fossa following distal adductor canal injection to color the popliteal plexus and the genicular branch of the posterior obturator nerve by dissection. (2) Assessment of the spread of dye after a femoral triangle injection.

Methods: Ten mL of dye was injected into the distal part of the adductor canal in ten cadaver sides, and into the femoral triangle in three sides. The spread of the dye to the popliteal plexus and the posterior obturator nerve, as well as the saphenous and medial vastus nerves was assessed.

Results: The popliteal plexus and the posterior obturator nerve were dyed in all ten dissections after adductor canal injections. The saphenous and medial vastus nerves were dyed and no dye spread into the popliteal fossa after femoral triangle injections.

Conclusions: We anticipate that this intelligent image-guiding system will improve the accuracy of epidural placement and therefore reduce medical complications associated with neuraxial blockade. Further clinical studies are needed to validate this preliminary animal study.

In this study we found out that it is more favorable to apply high level thoracic TEA than low level TEA in terms of its effects to hemodynamics, respiratory function test, gastrointestinal motility and hospital stay.

In AOB, SKB, DKB value, there were a significant difference between Group T 6-7 and Group T9-10 in the T1 measurement time (p<0.05). There were significant differences in terms of time for bowel movements to return and hospital stay between Group T 6-7 and Group T9-10 (p<0.05).
time of onset of block is shortened according to results of our study. And also, temperature of local anesthetic does not affect the motor and sensory block prolongation statistically.

FREE PAPER SESSION 2: PERIPHERAL NERVE BLOCKS
ESRA7-0357

MRI CLASSIFICATION FOR THE SPREAD OF LOCAL ANESTHETICS TO COMPARE DIFFERENT APPROACHES OF FASCIA ILIACA COMPARTMENT BLOCK
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Background and Aims: The success of “plane blocks” depends on the extent of spread of local anesthetics (LA). The supra-inguinal (S-FICB) and “classical” transverse (C-FICB) FICB have different clinical effects. This study evaluated the spread of LA after S-FICB and C-FICB using Magnetic Resonance Imaging.

Methods: After EC approval 10 healthy volunteers were recruited. After randomisation for side, each volunteer received a C-FICB and a contralateral S-FICB both with 40 mL lidocaine 0.5%.

The pelvis, hip and groin region were scanned 1h and 2h after injection of LA to determine spread around the psoas muscle, the femoral nerve (FN) and the obturator nerve (ON).

T1 (with/without Fat-Sat), axial T2 with Fat-Sat and coronal T2 with Fat-Sat MRI sequences were used to determine spread of LA. Coronal spread was measured per 10 mm cranial and caudal to the line between both anterior superior iliac spine (the “zero-line”). In the axial plane spread of LA was determined using a radar chart centred on the psoas muscle with 12 sections. McNemar’s chi square test was performed to analyse differences in spread.

Results: In the coronal plane, a more cranial spread was observed with a S-FICB compared to a C-FICB. In contrast, LA spread more caudally with a C-FICB compared to a S-FICB. In Table 1, Figure 1). The results for the axial plane and involvement of the FN and ON are represented in Table 2.

Table 2: Differences in spread per nerve (FN and ON) per level and sector according to relevant anatomical position of the nerve.

Conclusions: Spread of LA after FICB depends on the approach, where a S-FICB leads to a more proximal spread and nerve involvement than a C-FICB.

FREE PAPER SESSION 2: PERIPHERAL NERVE BLOCKS
ESRA7-0111

IMPACT OF NEURAL EXPOSURE TO LOCAL ANAESTHETIC ON NERVE BLOCK DURATION: A COHORT STUDY IN HEALTHY VOLUNTEERS

Background and Aims: Effects of circumferential spread on a nerve block is well described. Longitudinal local anaesthetic (LA) spread however, has not been investigated. One study showed decrements in action potentials when exposure length to LA was incrementally increased in a frog model.

We investigated whether longitudinal neural exposure to LA influences nerve block duration.

Methods: We analysed data from an ethical board approved prospective consecutive cohort of 120 healthy volunteers with a catheter-based common peroneal nerve block (3-20 mL of ropivacaine 0.2%).

Neural exposure to LA in millimetres was evaluated by ultrasonography by two observers. Parameters related to the intervention and the volunteers were registered and retrieved for assessment (Table 1). Sensory block duration defined as insensitivity towards cold was evaluated blinded to all other covariates.

We performed univariate and multivariate linear regression analyses to explore a potential association between neural exposure and block duration.

Results: All 120 volunteers had sensory nerve block. Duration ranged from 2 – 29 hours.

We found a univariate significant positive association between longitudinal neural exposure to LA and block duration (P < 0.0002). However, in our multivariate regression model neural exposure was excluded (P = 0.086). Volume of LA (volume: P < 0.0001), gender (P = 0.001) and BMI (P = 0.001) remained significantly associated with block duration.

Conclusions: Longitudinal neural exposure to LA was not associated with nerve block duration.

FREE PAPER SESSION 2: PERIPHERAL NERVE BLOCKS
ESRA7-0122

REAL-TIME CONTINUOUS MONITORING OF INJECTION PRESSURE AT THE NEEDLE TIP IN REGIONAL ANAESTHESIA: DESCRIPTION OF A NEW METHOD
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Background and Aims: The measurement of injection pressure during the performance of peripheral nerve blocks can be pivotal to detect an intraneural placement of the needle tip and to avoid intraneural injections. However, currently it can only be measured along the injection line, which is influenced by several
Four porcine lower limb anatomic models were prepared and ESRA Abstracts
The system was proved to be reliable. Thirty injections were success-
satis-
14 RCTs, including 904 participants provided data for the meta-
morphine PCA for post-Caesarean
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e57
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Conclusions: Intrathecal morphine along with oral oxycodeine provided similar pain control for the first 24 hours after Caesarean section, compared to morphine PCA. However, the patients’ satisfaction scores were higher in group A, even though it did result in a higher incidence of pruritus.

FREE PAPER SESSION 3: OBSTETRIC

ESRA7-0432

TRANSVERSUS ABDOMINIS PLANE BLOCK WITH LIPOSOMAL BUPIVACAINE WITH INTRATHecal MORPHINE FOR POSTOPERATIVE ANALGESIA AFTER CAESAREAN DELIVERY: A 1 YEAR RETROSPECTIVE REVIEW

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Background and Aims: In addition to intrathecal morphine, infiltration of local anesthetic into the transversus abdominis plane (TAP) is a way to provide analgiesia after caesarean delivery. The purpose of this study was to determine if the addition of a TAP block with liposome bupivacaine to intrathecal morphine provided any benefit over liposome bupivacaine TAP block alone following scheduled cesarean section.

Methods: This was a retrospective review of 360 patients who underwent caesarean delivery over a one year period. Patients were divided into two groups: those who received TAP blocks with liposome bupivacaine (69 patients) vs TAP blocks with liposome bupivacaine and intrathecal morphine (291 patients).

Results: After their PACU stay there were no significant differences in post operative ketorolac, acetaminophen, or ibuprofen. There was significantly less opioids given in the first 24 hours postoperatively (15 IQR 2.5 to 27.5 mg Morphine equivalents vs 5 IQR 0 to 15 mg Morphine equivalents; p=0.0001) and less total opioids (47.5 IQR 17.5 to 80 mg Morphine equivalents vs. 35 IQR 13.13 to 60 mg Morphine equivalents; p=0.039) in TAP vs TAP + IT Morphine respectively. There was no difference in opioids from 24-48 hours and 48-72 hours postoperatively.

Conclusions: Those patients who received a TAP block with liposome bupivacaine and IT Morphine had less opioids in the first 24 hours and total opioids suggesting that the visceral component of the cesarean section plays a role in postoperative pain and thus the addition of IT morphine to a TAP with liposome bupivacaine is beneficial.

FREE PAPER SESSION 3: OBSTETRIC

ESRA7-0417

OUR EXPERIENCE OF POST DURAL PUNCTURE HEADACHES OVER A FIVE YEAR PERIOD.

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Background and Aims: Post dural puncture headache (PDPH) is a recognised but rare complication of regional anaesthesia. These headaches can cause significant distress to both new mothers and to the anaesthetists who have to manage them. Here, we report our five year (2007-2011) experience with the occurrence and management of this complication.

Methods: Possible PDPH cases were identified by the presence of recognised dural tap at the time of the procedure and/or presence of subsequent headache. Case details were reviewed to identify confirmed PDPH cases. We evaluated mean time to recognition of PDPH, type of procedure causing PDPH, all aspects of documentation, interval to performing epidural blood patch and time to resolution of symptoms.

Results: 58 cases of PDPH were documented over this period. 91% and 9% were due to epidural and spinal anaesthesia respectively. The mean time for onset of headache after procedure was 1.5 days. The mean time for blood patch from the onset of PDPH symptoms was 48 hrs. Most common symptoms of PDPH were a postural headache and neck stiffness.

Conclusions: The audit confirmed the rare occurrence of this complication. The rate of use of epidural blood patch as a treatment for PDPH was 71% with good results and symptom resolution. The chart review has highlighted the need for a more structured approach to documentation and the lack of long term follow up of these patients. The reporting of a large case series such as this is of value in adding to the evidence base supporting the prevention and management of PDPH.

FREE PAPER SESSION 3: OBSTETRIC

ESRA7-0117

DO PREGNANT WOMEN SEARCH ON THE INTERNET ABOUT EPIDURAL?

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Background and Aims: Pregnant women are very likely to search for health information independently. The Internet plays an important role in supporting women with medical information on pregnancy. This survey aimed to describe use of the internet as the source of information about epidural technique and pregnancy.

Methods: After institutional research department approval, we submitted an anonymous 16 point questionnaire to 298 pregnant women between December 2014 and October 2016, during the anaesthetist run antenatal classes in a Northern Italy hospital. We investigated the use of the Internet to get information on pregnancy and on epidural technique for pain relief. In addition we evaluated satisfaction with information obtained using 5 point Likert Scale and if women had discussed information retrieved from the Internet with their physicians.

Results: Mean age was 32.3 years, gestation weeks 32.8. Almost all women had at least a high school degree (90.6%). Nulliparas were 77.5%. Internet access was 100%. 92.3% of pregnant women searched on the Internet about pregnancy, 26.9% among epidurals and pregnancy and no pregnant women search just about epidural analgesia. Women were very satisfied regarding information received (4.7). Most women do not discuss information found with health professionals (68%).

Conclusions: This survey found that women searched for information on the Internet about pregnancy but not about epidural technique. This is interesting since women surveyed could theoretically be interested in epidurals since they attended antenatal classes. Most women perceive Internet information to be useful and reliable, but few women discuss information found with health professionals.

FREE PAPER SESSION 4: MISCELLANEOUS

ESRA7-0420

THE ISA STICKER-A NEW FORMAT FOR DOCUMENTATION OF REGIONAL ANAESTHESIA IN IRELAND

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Background and Aims: Regional anaesthesia documentation in Ireland prior to 2017 varied greatly from institution to institution. There was no accepted standard in place. Multiple audits of regional anaesthesia documentation have revealed that the introduction of a sticker format for regional anaesthesia reduces the number of documentation errors and omissions. We therefore set out to design and introduce a regional anaesthesia sticker in conjunction with the Irish Society of Regional Anaesthesia (ISRA) as a national quality improvement initiative.

Methods: We used SMART (Specific, Measurable, Achievable, Relevant, Time-related) criteria to set out our objectives. Our aim was to produce an

FIGURE 1.
audit-able document suitable for all anaesthesia departments in Ireland to be completed within a 3 month time frame. We applied a PDSA (Plan, Do, Study, Act) cycle to our project. This included a literature review and a review of current documentation nationally. We designed and piloted a first draft. After review of pilot feedback, we redesigned and completed the final draft.

Results: In the absence of robust evidence, the contents of our document are based on national and international expert opinion while incorporating societal guidelines as to what should be included.

Conclusions: The sticker has been distributed to all anaesthesia departments across Ireland. Individuals can provide ongoing feedback via an ISRA email. It is hoped that this document will improve patient safety, act as an educational resource for anaesthesia trainee’s and provide adequate documentation in the event of litigation.

FREE PAPER SESSION 4: MISCELLANEOUS

ESRA7-0089

DESIGNING AND DELIVERING NON-TECHNICAL SKILLS SIMULATION BASED EDUCATION IN REGIONAL ANAESTHESIA

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Background and Aims: In the last decade there has been rising interest in non-technical skills (NTS) in anaesthetic practice. These set of skills are important to maintain the efficiency of a working team and deliver high quality service. Despite the importance of the NTS, its role has not been adequately emphasised in regional anaesthesia teaching curricula. In an attempt to introduce the anaesthetic trainee to NTS in regional anaesthesia, we designed a simulation based teaching session, using both actor and high fidelity mannequin simulation.

Methods: The designed simulation consisted of 4 stations. They incorporated task management, team working, situation awareness and decision making to assess anaesthetists’ NTS. Two involved an actor, which included consenting an anxious patient for regional block and interviewing a patient with suspected nerve injury. The mannequin based simulation involved preparation, communication and ergonomics while performing regional anaesthesia, followed by critical incident. Each session was led by a trainee and feedback on performance given afterwards.

Results: Through formal survey, the trainees highly valued the teaching session and the use of different styles of simulation. They felt it touched on important aspect of their daily practice which is rarely covered in formal teaching.

Conclusions: We believe there is a room for improvement. For example introducing remote video recording for better reflective learning and more stations to enrich the educational experience.

FREE PAPER SESSION 4: MISCELLANEOUS

ESRA7-0069

WORKLIFE BALANCE AMONG ANAESTHESIOLOGISTS - A SURVEY


Background and Aims: Work-life balance is a broad and complex dynamic, lacking in a universal definition. It is best understood as a concept describing proper prioritisation between work (career and ambition) and lifestyle (health, pleasure, leisure, family and spiritual development). Research has observed work-life conflict to be associated with a myriad of indicators of poor health and impaired wellbeing including poorer mental and physical health, higher levels of stress and emotional exhaustion, less physical exercise, increased anxiety and depression levels, poor appetite and fatigue. We conducted a survey among 816 anaesthesiologists in Bangalore regarding the velocity of the afo-mentioned dictum.

Methods: An online survey was conducted using 'Kwiksurvey' website amongst the 816 anaesthesiologists comprising of 20 questions contributing to, or hindering the achievement of the apt work-life balance. Anaesthesiologist of both sexes, all age groups, marital status, job designations and work sectors were included.

Results: We received 151 completed surveys. It was found that majority of anaesthesiologists (42.11%) work 8-16 hours daily; while of the remaining, 33.08% work 10-12 hours, 15.79% work 5-8 hours, 4.51% work 12-16 hours, 3.01% work 1-5 hours and 1.5% work more than 16 hours a day. The survey showed significant findings regarding satisfaction rate, priorities in life, active hobbies pursued and other related parameters.

Conclusions: The survey was concluded with the question of prime importance, to which 60.47% felt they had not achieved and the remaining 39.53% accepted they had reached their ideal work-life balance.

FREE PAPER SESSION 4: MISCELLANEOUS

ESRA7-0418

EFFECT OF HAND DOMINANCY ON PAIN ON INJECTION OF ETOMIDATE

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Background and Aims: Left or right hand dominance may affect the perception of pain on injection. Etomidate is an intravenous anesthetic agent used to induce general anesthesia with a significant pain on injection. The aim of the present study was to evaluate the effect of hand dominance on pain on injection of etomidate.

Methods: Thirty women aged 25 to 50 years, whom were candidates for elective laparoscopic cholecystectomy surgery were enrolled. Two 20-gauge cannulas were placed into dorsum of both hands. 100 ml of normal saline was infused. Four milligrams (2 ml) of etomidate was injected simultaneously with similar rates into the IV lines. The patient gave a score to each respective hand based on a Visual Analogue Scale.

Results: The mean VAS score in the dominant hand (respective of left or right) was 6.03±0.80 versus 4.66±1.24 in the non-dominant hand. VAS score among left-handed patients was significantly higher, with a mean of 6.52±0.6, while the mean VAS for dominant hand among right-handed patients was 5.52±0.5.

There was no significant difference in the VAS score in the non-dominant hand among the right-handed versus left-handed individuals (4.51±1.5 vs. 4.80±0.8 respectively).

Conclusions: This study shows that pain on injection is higher in the dominant hand, in both right and left-handed patients. Overall pain perception is also higher in left-handed patients. Non-dominant hand showed lower pain on injection with no difference between left or right-handedness patients.

FREE PAPER SESSION 4: MISCELLANEOUS

ESRA7-0087

BILATERAL STERNAL INFUSION OF ROPIVACAINE AND LENGTH OF STAY IN ICU AFTER CARDIAC SURGERY WITH INCREASED RESPIRATORY RISK: A RANDOMISED CONTROLLED TRIAL

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Background and Aims: The continuous bilateral infusion of a local anesthetic solution around the sternotomy wound (bilateral sternal) is an innovative technique for reducing pain after sternotomy. The aim was to assess the effects of the technique on the need for intensive care in cardiac patients at increased risk of respiratory complications.

Methods: Randomised, observer-blind controlled trial. 120 adults patients scheduled for open-heart surgery with one of the following conditions: age more than 75 years, BMI>30kg/m², chronic obstructive pulmonary disease, active smoking habit, were included. The bilateral sternal infusion of 0.2% ropivacaine (3ml h⁻¹) through each catheter; ‘intervention’ group, was compared with standardised care (‘control’ group). Analgesia was provided with paracetamol and self-administered intravenous morphine. The main outcome...
Results: No effect was found between groups for the primary outcome (P=0.680, intention to treat); the median values were 42.4 and 37.7h, respectively for the control and intervention groups (P=0.873). Similar non-significant trends were noted for other postoperative delays. Significant effects favouring the intervention were noted for dynamic pain, patient satisfaction, occurrence of nausea and vomiting, occurrence of delirium or mental confusion and occurrence of pulmonary complications. In 12 patients, although no symptoms actually occurred, the total ropivacaine plasma level exceeded the lowest value for which neurological symptoms have been observed in healthy volunteers.

Conclusions: Because of a small size effect, and despite significant analgesic effects, this strategy failed to reduce the time spent in ICU.

FREE PAPER SESSION 5: POSTOPERATIVE PAIN MANAGEMENT

ESRA7-0316

THE EFFECT OF PREEMPTIVE DEXKETOPROFEN ADMINISTRATION ON POSTOPERATIVE PAIN MANAGEMENT IN PATIENTS WITH ULTRASOUND GUIDED INTERSCALENE BLOCK IN ARTROSCOPIC SHOULDER SURGERY

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Background and Aims: Postoperative pain is an important problem for patients who underwent shoulder surgery. In this study, we aimed to investigate analgesic efficiency, analgesia time, postoperative analgesic usage and patient satisfaction on preemptive deksetoprofen usage for interscalene block (ISB) in addition to general anaesthesia in arthroscopic shoulder surgery.

Methods: 60 patients included to study who were 18-65 years old, ASA I-II and underwent scheduled arthroscopic shoulder surgery. Patients were divided into equal groups randomly. Groups are assigned as Group I was Control and Group II was Deksetoprofen group. 15 minutes prior to incision 100 ml 0.9 NaCl i.v. was infused in Group 1. Also 15 minutes prior to incision 50mg deksketoprofen in 100 ml 0.9 NaCl was infused in Group 2. In all cases after single-shot ISB general anaesthesia was performed. For ISB 20 ml (lidocaine 2% 10ml and bupivacaine 0.5% 10ml mixture) given.

Results: Comparison of groups by demographic and hemodynamic data showed no significant difference statistically. There was no statistically significant difference between groups in motor block time. However, sensory block time was significantly different between the Group 1 and Group 2. Comparison of VAS score shown statistically significant difference in favor of deksetoprofen group which have lower score in all times (p<0.05). Total PCA fentanyl usage in postoperative 48 h was 490.00 ± 408.98 and 274.16 ± 314.89 in Group I and Group II, respectively and there was statistically significant difference (p<0.05).

Conclusions: Preemptive deksetoprofen usage provide longer sensory block time, less postoperative pain scores and less opioid consumption.

FREE PAPER SESSION 5: POSTOPERATIVE PAIN MANAGEMENT

ESRA7-0334

DO WE CAUSE HARM USING DEXMEDETOMIDINE ON ARTICULAR CARTILAGE AND SYNOVIIUM IN RAT KNEE?

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Background and Aims: Intrarticular injections are performed to provide postoperative analgesia and to minimise the need for opioids. Intrarticlar dexmedetomidine was proven to enhance postoperative analgesia after arthroscopic knee surgery and also increase time to first analgesic demand. However, the effects of dexmedetomidine on articular cartilage has not been studied yet.
Our aim was to evaluate the effects of intraarticular dexmedetomidine injection on the articular cartilage and synovium.

**Methods:** Twenty adult Spraque-Dawley rats were enrolled in the study. After providing anesthesia and aseptic conditions; 0.25 ml dexmedetomidine (25 μg) was injected to the right knee joint and 0.25 ml normal saline (control group) was injected to the left knee joint. In days 1, 2, 7, 14 and 21, knee joint scores were obtained from 4 rats in each group. Two blinded histologists evaluated the histological sections of the articular, periarticular regions and synovium and inflammatory changes were graded according to the five-point scale in a blinded manner.

**Results:** There were no significant differences in terms of inflammation, median congestion scores (p=0.180), edema scores (p=0.317), neutrophil infiltration (p=0.059), subintimal fibrosis, cartilage structure (p=0.317) between groups on first day and also in any of the time intervals.

**Conclusions:** In this in vivo placebo-controlled trial, intraarticular injection of dexmedetomidine on rat knee cartilage seems to be a safe method concerning histopathological parameters that are studied. However, further studies investigating both the analgesic dosage, histopathological effects and side effects of dexmedetomidine on damaged articular cartilage and synovium models are needed.

**FREE PAPER SESSION 5: POSTOPERATIVE PAIN MANAGEMENT**

**ESRA7-0367**

**THE EFFECT OF FENTANYL 12 MCG TRANSDERMAL PATCH ON POSTOPERATIVE PAIN FOLLOWING UNILATERAL, SINGLE-LEVEL LAMINECTOMY/DISCECTOMY: A RANDOMIZED, CONTROLLED, DOUBLE-BLIND STUDY**

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**Background and Aims:** Postoperative pain after laminectomy/disectomy must be managed with an efficient, safe and effort-effective method. Fentanyl transdermal patch provides these advantages, however previous papers using high doses such as 75 μg long suggested a higher risk of respiratory complications concomitantly with superior analgesia. But, a lesser dose may also provide a safe and practical analgesic plan. Here, we studied the effect of fentanyl 12 mcg transdermal patch on postoperative pain following unilateral, single-level laminectomy/disectomy.

**Methods:** After approval of institutional ethics committee (KA14/166) and informed consents, 78 patients undergoing single-level laminectomy/disectomy were randomly enrolled into control group (CG) or fentanyl 12 mcg transdermal patch group (FG). Patients received the patch 8 hours preoperatively and until 24 hours postoperatively. Standard general anaesthesia and analgesia with tramadol 20 mg were used in both groups. Demographic data, numeric rating score for pain (NRS) prior to patch, preoperatively, postoperatively at 5th, 30th minutes, 1st, 2nd, 4th, 6th, 12th, 18th, 24th hours, haemodynamic and respiratory parameters, opioid side effects, rescue drugs and need for staff workforce were recorded.

**Results:** There was no difference between groups regarding demographic data and initial, 12th, 18th, 24th hour NRS scores, opioid-related side effects. However, NRS scores preoperatively, postoperatively at 5th, 30th minutes, 1st, 2nd, 4th, 6th hours were significantly higher, the need for rescue drug and nurse workforce both at the postoperative care unit and ward was significantly more in CG (p<0.05).

**Conclusions:** We suggest that fentanyl 12 mcg transdermal patch provides effective and safe pain relief preoperatively and in the first 6 postoperative hours following unilateral, single-level laminectomy/disectomy.

**Background and Aims:** This study sought to evaluate the safety and effectiveness of cooled RFA (CRFA) when compared to intrarticular steroid injection (IAS) in an osteoarthritic (OA) knee population. The 12-month data are presented.

**Methods:** One-hundred and fifty-one subjects were randomized to receive 50%, and the mean increase in the Oxford Knee Score (OKS) from baseline was 17.3 points (p < 0.0001). Seventy-five percent reported pain reduction at 12 months was significant in the original CRFA (N = 58), and followed for an additional 6 months. The original CRFA study subjects were followed for a total of 12 months (N = 52). Study approval was granted by two Institutional Review Boards.

**Results:** Pain reduction at 12 months was significant in the original CRFA group, with a mean decrease from baseline on the numeric rating scale (NRS) of 4.3 points. Sixty-five percent of the CRFA group had pain reduction that was ≥ 50%, and the mean increase in the Oxford Knee Score (OKS) from baseline was 17.3 points (p < 0.0001). Seventy-five percent reported “improved” effects from CRFA treatment. The cross-over group also responded favorably to treatment, demonstrating significant improvements from baseline (p < 0.0001) in pain and function. There were no unanticipated serious adverse events related to the CRFA procedure.

**Conclusions:** Durable clinical effectiveness of CRFA for treating OA-related chronic knee pain and disability was demonstrated. The cross-over study subjects experienced significant pain relief and functional improvement.

### FREE PAPER SESSION 6: CHRONIC PAIN MANAGEMENT

**ESRA7-0445**

**USE OF CAPSAICIN PATCH IN THE TREATMENT OF NEUROPATHIC PAIN OF VARIOUS ORIGIN**

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**Background and Aims:** Capsaicin 8% patch is used for the treatment of postherpetic neuralgia and HIV-induced neuropathy. Pain reduction has been suggested in other conditions but its use is restricted due to the high price and short-term effect.

The authors analysed the results of the use of capsaicin 8% (Qutenza®) for treatment of neuropathic pain syndromes of various origin.

**Methods:** Patients treated with capsaicin 8% patch were retrospectively selected from January 2011 to May 2017.

All patients had refractory neuropathic pain syndromes of various origin. NRS for pain (NRS) and Global Perceived Effect (GPE) were monitored after two weeks and 1 month. NRS reduction of ≥ 3 or a GPE ≥ 50% was considered as clinical relevant.

**Results:** Patients were divided in a postherpetic-, postoperative -, trauma and miscellaneous group. The postoperative group was subdivided into a peripheral nerve, scar tissue, posttraumatic and radicular subgroup.

Thirty-seven patients were treated with a capsaicin patch of which 9 patients experienced substantial improvement after 1 or more treatments. Two out of 12 of postoperative nerve injury patients had benefit.

No patients in the scar group had long-term effects.

50% of the patients in the postoperative subgroup “after trauma surgery” had clear benefits. 40% of trauma patients without surgery experienced benefits of the treatment.

**Conclusions:** The highest response after capsaicin treatment was seen for post-traumatic neuropathic pain with and without surgery. Less effect was seen on postoperative neuropathy after elective surgery. No effect could be seen on scar pain.

### FREE PAPER SESSION 6: CHRONIC PAIN MANAGEMENT

**ESRA7-0459**

**CHRONIC PAIN ULTRASOUND GUIDED ERECTOR SPINAE PLANE BLOCK**

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**Background and Aims:** Oncological chronic pain is a complex and difficult problem to address in which peripheral nerve blocks can be a precious help to achieve a better quality of life.

We present a case of severe unilateral chronic thoracic pain management, in an ambulatory oncological patient, with the Erector Spinae Plane Block (ESPB), aiming the treatment of the multilevel thoracic unilateral pain with one single puncture.

**FIGURE 1.**

**TABLE 1.**

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Methods: 68-year-old men, history of arterial hypertension, dyslipidemia and heavy ex-smoker. Since one year ago developed severe right chest wall neuro-pathic pain, due to lung cancer bone metastases (7th and 8th intercostal spaces). Conventional medications with opioids and adjuvants were insufficient (VAS score 8) and we did an ESPB.

We performed the ultrasound-guided technique with a linear probe, placed 3 cm to the right lateral side of T5 spinous process, in longitudinal orientation, then a 100 mm short bevel needle was then inserted in-plane, cephalad-to-caudad direction, through trapezius, rhomboid major and erector spinae muscles, until the tip of T5 transverse process, injecting 20 ml of ropivacaine 0.2% into the interfascial plane, deep to ESM.

Results: The procedure progressed uneventfully. The patient reported immediate total relief of pain and great satisfaction.

Conclusions: The Ultrasound Guided Erector Spinae Plane Block appears to be an excellent technique, especially for immediate relief of severe multilevel thoracic chronic pain, with apparent excellent safe profile and relative easy execution.

FREE PAPER SESSION 6: CHRONIC PAIN MANAGEMENT
ESRA7-0100
COLOR DOPPLER ULTRASOUND IDENTIFIES SIGNIFICANT LUMBAR DURAL LEAK
Clendenen S. Mayo Clinic, Anesthesiology, Jacksonville, USA.

Background and Aims: A 63-year-old male who underwent elective lumbar discectomy with and Dural repair elsewhere was referred for six month history of ongoing headache and leg pain. The patient had symptoms consistent of cerebral spinal leak and postural headache. An attempted blood patch was unsuccessful.

Methods: Ultrasound exam of the lumbar spine was performed using a curved array probe to identify a pseudomeningocele. We repeated the ultrasound exam with color flow Doppler during a Valsalva maneuver in attempt to identify the defect in the Dura.

Results: A large pseudomeningocele with two communicating chambers was identified at the level of L 5-S1. Color Doppler ultrasound revealed a cerebral spinal fluid leak midline with a color jet communicating between the two chambers. (Figure 1) The patient was taken to the operating room for closure of the Dural defect and resection of a small right L5-S1 disc extrusion. (Figure 2) Repeat lumbar ultrasound exam one week following the surgery showed no fluid collection implicating a successful Dural repair and resolution of patient’s symptoms.

FREE PAPER SESSION 7: P AEDIATRICS
ESRA7-0125
ULTRASOUND ASSESSMENT OF CRANIAL SPREAD DURING CAUDAL BLOCKADE IN CHILDREN: EFFECT OF DIFFERENT VOLUMES OF LOCAL ANESTHETIC
Sinha C., Kumar A., Kumar A., Bhadani U. All India Institute of Medical Sciences- Patna, Anaesthesia, Patna, India.

Background and Aims: Ultrasound guided caudal block injection is a simple, and effective method of anesthesia/analgesia in pediatric patients. The volume of caudal drug required has always been a matter of debate. We aimed to compare the effect of volume on the primary spread of local anaesthetic in the caudal space.

Methods: This present prospective, randomized, double blinded study aimed to measure extent of the cranial spread of caudally administered levobupivacaine in Indian children by means of ultrasonography. 90 ASA I/II children scheduled for urogenital surgeries were enrolled in this double blinded randomised controlled trial. Anesthesia and caudal analgesia was administered in a standardised manner in the patients. The patients received 0.5 ml/kg or 1 ml/kg or 1.25 ml/kg 0.125% levobupivacaine according to the group allocated. Cranial spread of LA was noted using ultrasound.

Results: A significant difference was found between group 1 (0.5 ml/kg) with both group 2 (1 ml/kg) (P-0.001) and with group 3 (1.125 ml/kg) (P-0.000), but there is no significant difference between group 2 and group 3 (P-0.451) revealing that spinal level spread is only different between 0.5 ml/kg and 1 ml/kg of local anaesthetic.

Conclusions: In conclusion, the ultrasound assessment of local anaesthetic spread after a caudal block showed that cranial spread of the block is dependent on the volume injected into the caudal space. Since there was no difference between 1ml/kg and 1.25 ml/kg, in order to achieve a dermatomal blockade up to thoracic level we might have to increase the dose beyond 1.25 ml/kg, keeping the toxic dose in mind.
FREE PAPER SESSION 7: PAEDIATRICS

ESRA7-0158

EPIDURAL ANALGESIA IN PAEDIATRIC SCOLIOSIS SURGERY: AN EFFECTIVE APPROACH

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Background and Aims: Paediatric scoliosis surgery aims at stopping the progression of the disease and improving quality of life and physical appearance, one of the downsides being an expectedly painful postoperative period. During 2015 a new pain management protocol was designed to optimize pain control and Intensive Care Unit (ICU) stay. The analgesia includes placement of epidural catheters at the end of surgery and postoperative epidural infusion of Ropivacaine and Morphine. The aim of this study is to evaluate the effectiveness of epidural analgesia up to 48 hours after surgery, the incidence of adverse events and length of ICU stay.

Methods: Retrospective analysis was performed before protocol development - 2012-2014 (n=17) and after protocol implementation - 2016 (n=21). Nonparametric Mann-Whitney test, Fisher’s exact test and Spearman’s correlation coefficient were used. A level of significance α=0.05 was considered. Data were analysed using SPSS®.

Results: There were no statistical differences between groups in regard to gender, age and scoliosis etiology. The pain scores and rescue analgesia of the epidural group were statistically lower at immediate postoperative, 24 and 48 hours after surgery (p<0.001). There was no significant difference on adverse events between groups. ICU length of stay was statistically shorter with epidural analgesia (p=0.001).

Conclusions: We concluded that epidural analgesia is effective in paediatric scoliosis surgery with significant reduction on pain scores and ICU length of stay. Despite excessive sedation with Alfentanil was reported in 17.6%, comparing to zero in the epidural group, it did not reach statistical difference. A larger study is needed to confirm these results.

FREE PAPER SESSION 7: PAEDIATRICS

ESRA7-0231

REAL TIME ULTRASOUND-GUIDED SPINAL ANESTHESIA IN INFANTS – A RECENT SINGLE-CENTER EXPERIENCE

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Background and Aims: Spinal anesthesia appears to be a good alternative to general anesthesia in neonates and infants. Ultrasonography can be an important resource, since it allows direct visualization of structures. Literature related to this topic is sparse. We describe four cases in which ultrasound guided spinal anaesthesia (USSA) was successfully performed.

Methods: Four cases of infants undergoing infra-umbilical surgery under spinal anesthesia (USSA), in last three months were studied retrospectively. Infants were positioned in lateral decubitus and a high frequency linear US transducer was placed in a longitudinal orientation in the median plane of spine. After identifying intervertebral spaces, dura mater, lumbar spinal puncture was performed in plane with a 26 gauge Quincke needle and bupivacaine 0.5%, (0.5mg/kg) was administered. Sedation with sevoflurane was maintained for performing block, after they remain calm with a pacifier. Demographic data, prematurity history/ comorbidities, vital parameters, time to onset/duration surgery, supplementary drugs, complications and discharge were noted.

Results: Mean age was 33/months, 2 preterm infants, ASAII. USSA was successful in all infants, after first attempt. Mean time for onset of surgery was 33min. Motor block was associated with adequate sensory block. Surgery lasted on average 50min without cardiorespiratory complications or conversion to general anesthesia. They were discharged at 2nd postoperative day.

Conclusions: Ultrason was used to determine space and depth to reach within the spinal canal, ensure direct visualization of needle and proximal structures, avoiding a failed block or neurovascular punctures. No cardiorespiratory repercussion was observed. Technique was rapidly performed and allowed to reduce exposure to general anesthetics at a critical period of development.

FREE PAPER SESSION 7: PAEDIATRICS

ESRA7-0247

COMPARISON OF THE ONE-PLANE AND TWO-PLANE METHOD OF ULTRASOUND-GUIDED ILIOINGUINAL-ILIOHYPOGRASTIC (IIH) NERVE BLOCK AS POSTOPERATIVE ANALGESIA IN A PAEDIATRIC AMBULATORY HERNIORRHAPHY

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Background and Aims: The IIH nerve block is normally performed between internal oblique muscle (IOM) and transversus abdominis muscle (TAM). We hypothesized that a two-plane block, i.e. IOM/TAM and external oblique muscle (EOM)/IOM, would be more effective for postoperative analgesia. This study was a randomized, controlled, prospective study comparing the efficacy of one-plane and two-plane block as postoperative analgesia in pediatric ambulatory unilateral inguinal herniorrhaphy.

Methods: After IRB approval, 263 patients aged 6 months to 8 years were randomly assigned to either one-plane (TAM/IOM) or two-plane (TAM/IOM and EOM/IOM) group. The one-plane group received a 0.2% ropivacaine 0.3ml/kg. The two-plane group received a 0.2ml/kg injection between TAM/IOM followed by a 0.1ml/kg injection between EOM/IOM. The primary outcome was the FLACC scale after 45 minutes evaluated by PACU nurses blinded to the groups. The secondary outcome was additional analgesia within two and 24 hours. Body-movement at incision was interpreted as failed block. Statistical analysis was performed using Mann-Whitney U-test and Pearson’s Chi-squared test.

Results: 242 patients completed this study. No patient moved at incision. The FLACC scale at 45 minutes didn’t differ significantly between the groups.
No analgesics were required by 85.1% and 76.5% patients in one-plane group and 78.5% and 64.4% patients in two-plane group at two and 24 hours without significant difference (P=0.182, P=0.068), respectively.  

**Conclusions:** Both methods achieved sufficient post-operative analgesia. There was no significant difference either in the FLACC scale at 45 minutes after anesthesia or in the requirement for analgesia within 24 hours between the groups.

**FREE PAPER SESSION 8: CASE REPORTS**

**ESRA7-0204**

**EPIDURAL CATHETER MANAGEMENT AND EXIT STRATEGY IN PATIENT WITH SEVERE THROMBOCYTOPENIA AND COAGULOPATHY AFTER EPIDURAL CATHETER INSERTION: A CASE REPORT**

Nur Hafizhoh A.H., Ali A. KK Women’s and Children’s Hospital, Paediatric Anaesthesia Department, Singapore, Singapore.

**Background and Aims:** Extensive guidelines are published pertaining epidural catheter insertion, maintenance and catheter removal amongst patients receiving anticoagulant, antiplatelet and herbal medicine specifically aimed to modify the coagulation and platelet functions. Very limited recourses and guidelines in the management of epidural and epidural catheter removal are available addressing patient who developed thrombocytopenia and coagulopathy after insertion of epidural catheter. Furthermore, management of this scenario in pediatric population faces further challenges. We report a case on the management of epidural and epidural catheter exit strategy in 19 months old boy who had normal preoperative platelet counts and coagulation profile, went on to develop severe thrombocytopenia and coagulopathy following nephron sparing Wilms tumour resection. The surgery was unduly complicated and prolonged due to unexpected difficulty encountered during the procedure, resulting in patient developing severe thrombocytopenia and coagulopathy.

**Methods:** After extensive literature reviews and meticulous management of this case, we have formulated a step-wise approach on the management of epidural and epidural catheter exit strategy in patient with unexpected postoperative thrombocytopenia and coagulopathy as shown in Figure 1 and Figure 2.

**Results:** Results are shown in Figures 1 and 2.

**Conclusions:** We propose these strategies to be used as a guideline in managing pathologically induced thrombocytopenia and/or coagulopathy in both pediatric and adult patients.

**FREE PAPER SESSION 8: CASE REPORTS**

**ESRA7-0262**

**BILATERAL SERRATUS PLANE BLOCKS; A NOVEL APPROACH TO BILATERAL RIB FRACTURE PAIN CONTROL IN A POLYTRAUMA PATIENT**

Abouelmagd R., Kumar A., Stack C. Kings College Hospital, Anaesthesia, London, United Kingdom.

**Background and Aims:** Pain associated with rib fractures is usually severe leading to hyperventilation and predisposing patients to atelectasis, retention of secretions and pneumonia. These factors combined with underlying lung damage, intrapulmonary shunting and altered breathing mechanics put these patients at a significant risk of high morbidity and mortality. We report a novel approach to management of these cases.

**Methods:** A 77-year-old male polytrauma patient with multiple bilateral rib fractures, flail segment, manubrial and spinal fractures was referred for pain management after failure of conventional management. Thoracic epidural, as per King’s protocol, was inappropriate because of the multiple unstable vertebral fractures for which the patient was immobilised. We opted for bilateral serratus plane blocks with catheter insertion. Ultrasound guided, in-plane blocks were performed using 18-gauge Tuohy needle. The latissmus-dorsi and serratus muscles were identified at the nipple level, midaxillary line and 30mls levobupivacaine 0.25%, were injected between the muscles on each side and epidural catheters sited. Top-ups were prescribed 12-hourly.

**Results:** The patient reported a remarkable drop in his pain scores 15 minutes post-block as well as 6 and 12 hours later (figure 1). The catheters were left in place for 7 days and were assessed on daily basis. No signs of local or systemic sepsis were noted.

**Conclusions:** To our knowledge, the use of serratus plane blocks for bilateral rib fracture pain has not been previously reported. Serratus plane blocks are easy to perform, relatively safe and reliable. They could have an important role in rib fracture pain management in situations where conventional methods are inappropriate.
Background and Aims: The application of general or neuraxial anesthesia is standard practice for hip fracture surgeries, however, geriatric patients, due to a high prevalence of comorbidities, are often at high risk of anesthesia-related complications. Peripheral nerve blockade (PNB), though technically challenging, may reduce the risk of such complications. Here, we report our experience applying PNB to a multi-comorbid geriatric patient with right intercostal/intervertebral fracture who underwent ORIF with cephalorhomboidal nail.

Methods: This is a 68-year-old man, ASA-III, with complicated history: 1. CAD-3, STEMI post balloon angioplasty and bare metal stent; 2. Atrial fibrillation, receiving warfarin; 3. Right lung abscess post surgery with significant lung volume reduction; 4. COPD, DM; 5. ESRD, receiving regular hemodialysis. After obtaining informed consent, we performed comprehensive PNB on femoral, obturator, lateral femoral cutaneous, and sciatic nerves (para-sacral approach). Regimens used are listed in Table 1. Despite the administration of extensive PNB, no systemic toxicity was noted.

Results: A good quality of anesthesia was obtained. Midazolam 2mg and buprenorphine 17.5 mcg/h transdermal patches, every 3 days. A good quality of anesthesia was obtained. Meticulous monitoring during the 150-minute operative period. Intraoperative hemodynamics were stable without episode of apnea or hypoxia. Analgesia on the 1st and 2nd post-operative day was achieved with tramadol-acetaminophen (Ultracet®) QID only, and the pain intensity evaluated by NRS was around 2 to 3.

Conclusions: Ultrasound-guided PNB can achieve safe and satisfactory anesthesia for hip surgeries. For patients at significant risks of general and neuraxial anesthesia, ultrasound-guided PNB is probably a better alternative.
Abstracts and Highlight Papers of the 36th Annual European Society of Regional Anaesthesia & Pain Therapy (ESRA) Congress 2017: Poster Discussion Abstracts

E-POSTER DISCUSSION SESSION 01: CENTRAL NERVE BLOCKS

ESRA7-0095

COMPARISON OF CAUDAL MORPHINE WITH BUPIVACAINE OR BUPIVACAINE ALONE FOR POST OPERATIVE ANALGESIA IN PATIENTS WITH ANKYLOSING SPONDYLITIS UNDERGOING TOTAL HIP REPLACEMENT UNDER GENERAL ANAESTHESIA

Arora M.K., Bansal S., Kashyap L., Prasad G., and Chhabra A. All India Institute of Medical Sciences, Anaesthesiology, New Delhi, India.

Background and Aims: There is ossification in spinal ligaments thus caudal space can be used as an alternative site for insertion of epidural catheters in patients with ankylosing spondylitis as the sacrococcygeal membrane is usually not ossified.

Objective: To compare the efficacy of 0.125% bupivacaine alone or in combination with 50 mcg/kg of morphine.

Methods: Prospective, double blind, randomized controlled trial with 31 ASA I and II adults patients, aged 18-60 years, diagnosed with ankylosing spondylitis and scheduled to undergo total hip replacement surgery. Caudal epidural catheter was placed in lateral position after induction with GA. After establishing a negative test dose, 12 ml of 0.25% bupivacaine was administered prior to skin incision. Patients in Group B (n=15) were administered epidural 0.125% bupivacaine and in group BM (n=15) 0.125% bupivacaine with 50 mcg/kg morphine. After the completion of surgery of dye spread through the epidural catheter was ascertained.

Results: VAS Scores were comparable between the two groups in postoperative period. Intraoperative and post operative fentanyl requirement was comparable between the 2 groups i.e 126.92 + 33.80 mcg in group B as compared to the 136.67 + 29.87 mcg in group BM (p=0.88) and 413.00 + 105.48 mcg as compared to the group BM 426.67 + 89.87 mcg. (p=0.82) respectively. The incidence of post operative urinary retention was minimally higher in the group BM 426.67 + 89.87 mcg. (p=0.82) as compared to the group B 126.92 + 33.80 mcg. (p=0.88) respectively. The incidence of post operative urinary retention was minimally higher in the group BM 7/15 (46%) as compared to group B 4/13 (30%) (p=0.005)

Conclusions: Caudal bupivacaine with or without morphine was found to provide adequate post operative analgesia in patients of AS for total hip replacement.

E-POSTER DISCUSSION SESSION 01: CENTRAL NERVE BLOCKS

ESRA7-0057

RETROSPECTIVE SURVEY OF CONTINUOUS INTRATHECAL CATHETERS, CHANGES IN PRACTICE AND COMPLICATIONS

Woon K.L. Changi General Hospital, Anaesthesia and Intensive Care, Singapore, Singapore.

Background and Aims: Continuous spinal anaesthesia is a useful and versatile technique for providing anesthesia in patients with high risk of cardiopulmonary complications. However, its use has declined due to fear of neurological complications e.g. post dural puncture headache, infection and cauda equina syndrome which led the FDA to ban spinal microcatheters. We aim to analyze the hemodynamic stability of CSAs, incidence and reasons behind failure and complications.

Methods: Retrospective data was collected from audit records of Changi General Hospital on all central neuraxial blocks that have been done since 2008. Review of drugs, technique and equipment and follow up on pain scores and complications was done. Anaesthetic records were traced to map the intraoperative variation in mean arterial pressure after CSA. Those with failed CSAs or complications were also traced and checked for qualitative notes on reason behind failure.

Results: Out of 118 CSAs audited, all patients were ASA 3–4 with multiple cardiovascular comorbidities. Most common complications included technical difficulties (n=5) e.g. catheter kinking, difficult insertion. Of note, there were no cases of neuraxial infection or permanent neurological deficits. We report the most serious complications of catheter breakage inside patient (n=1) and PDPH (n=1).

Conclusions: CSA is an effective technique in carefully selected patients with limited cardiopulmonary reserves. The gradual onset of sympatholysis allows for stable hemodynamics. The historical complications associated with CSA have reduced incidence due to advancement in equipment. Failure is commonly due to technical factors. Its use may have fallen out of favour due to unfamiliarity and sparsity of training and education.

FIGURE 1.

FIGURE 2.

The reasons for this decline are not clear. We hypothesize that the most important reasons may be due to the increase of laparoscopic interventions and to the growing number of patients under anticoagulant treatment with DOACs (Xareleto, Lixiana, Eliquis), for which the national and international guidelines (ASRA, ESRA, ESA, DGAI, SFAR) recommend caution for neuraxial anaesthesia.
We have analyzed the statistical data of neuraxial blocks, of laparoscopic procedures and of the prescriptions of DOACs in our Hospital from 2006 to 2016.

Results: The increase in laparoscopic procedures is significant from 186 procedures in 2006 to 432 procedures in 2016, most of them performed by general and visceral surgeons (Figure 2).

We have also analyzed the trend in prescription of DOACs from 2009 (year of introduction of Rivaroxaban to the list of medications of our hospital) to 2017. The increase is impressive and seems to take an exponential course (Figure 3).

Conclusions: Growing number of laparoscopies and treatments with DOACs could play a role in the drop of neuraxial blocks.

Because of lack of available literature we don’t know if this trend is limited to our hospital or if it is a general finding. This brief report is meant to be an invitation to reflect on this argument and to analyze the trend in other institutions.

E-POSTER DISCUSSION SESSION 01: CENTRAL NERVE BLOCKS

ESRA7-0197

HIGH-DOSE INTRATHecal Diamorphine FOR POSTOPERATIVE ANALGESIA FOLLOWING LAPAROSCOPIC BARIATRIC SURGERY: A SINGLE CENTRE CASE SERIES


Background and Aims: Postoperative pain after laparoscopic sleeve gastrectomy (LSG) and laparoscopic roux-en-Y gastric bypass (LRYGB) can be difficult to manage and almost always requires systemic opioid analgesia. This can exacerbate postoperative nausea and vomiting (PONV) and respiratory complications, particularly in the obese population. Intrathecal morphine has recently been studied in bariatric surgery, with promising results [1].

Methods: We reviewed patient records for those who received high-dose intrathecal diamorphine for postoperative analgesia at our institution between December 2015 and January 2017.

Results: 18 patients received spinal analgesia comprising isobaric bupivacaine (3.5 mg) and diamorphine (1–1.25 mg) prior to general anaesthesia. 12 patients then underwent LSG and 6 had RYGB. All patients received 100mg fentanyl during induction of anaesthesia and 1g intravenous paracetamol intraoperatively. One patient required 3mg morphine and eight received 75mg intravenous diclofenac intraoperatively.

Overall, 11 patients (61%) were pain-free in the PACU and 5 patients (28%) required rescue morphine. During the perioperative period and subsequent 24 hours, 8 patients (44%) required no strong opioid medication whatsoever.

Although 3 patients experienced self-limiting pruritus, there were no cases of respiratory depression, airway complications or excessive sedation complicating PACU stay.

Conclusions: Our experience shows that high-dose intrathecal diamorphine is a safe and effective analgesic strategy for patients undergoing bariatric surgery, including those with a diagnosis of obstructive sleep apnoea. Further prospective study is warranted to quantify advantages of using this technique in the bariatric population.

E-POSTER DISCUSSION SESSION 01: CENTRAL NERVE BLOCKS

ESRA7-0447

CUTANeous TEMPERATURE MEASUREMENT AS A MEANS OF ASSESSING LUMBAR EPIDURAL ANALGESIC EFFICACY

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Background and Aims: Local anaesthesia within the epidural space produces a sympathetic block causing increased cutaneous blood flow and an increase in skin temperature providing a method of assessing epidural success. The primary objectives are to demonstrate that a thermal imaging camera allows early detection of the presence of sympathetic block permitting determination of analgesic efficacy.

Methods: 44 patients were enrolled with one patient excluded due to failure of the thermal imaging camera. The cutaneous temperature was measured over the first 24 hours of both feet using an infrared thermal imaging camera before epidural insertion and at five, ten and twenty minutes post local anaesthetic bolus. Numerical verbal rating scale scores were documented at the time of epidural request and at thirty minutes post local anaesthetic bolus.

Results: A median temperature rise was associated with time post epidural insertion and local anaesthetic bolus. At five minutes sensitivity was 96.15% (80.36–99.9), specificity 5.88% (0.15–28.69), PPV 100% (57.56–64.29) and NPV 50% (96.28–93.72). At ten minutes sensitivity was 96.88% (83.78–99.92), specificity 90.09% (0.23–41.28), PPV 75.61% (71.8–79.06) and NPV 50% (6.35–93.62). At twenty minutes sensitivity was 80.49%
(65.13–91.18), specificity 9% (0–84.19), PPV 94.20% (93.42–95.05) and NPV 90%.

Conclusions: Cutaneous temperature is effected by multiple variables making it lacking specificity in assessing analgesic efficacy. Measuring cutaneous temperature to assess the clinical effectiveness of an epidural for labour analgesia is not recommended as the sole modality and other more established methods should be utilised.

E-POSTER DISCUSSION SESSION 02: PERIPHERAL NERVE BLOCKS I

ESRA7-0110

CAN WE PROVIDE EFFICIENT ANALGESIA WITH 2 MG PERINEURAL DEXAMETHASONE ADDED TO INFRACLAVICULAR BLOCK ANESTHESIA?

Denisa-Madalina A., Ana-Maria M., Simona F.C., and Gheneadie P. Clinical Hospital of Orthopedics Foior, Department of Anesthesiology, Bucharest, Romania.

Background and Aims: Perineurally dexamethasone prolongs the duration of postoperative analgesia but the lowest dose is not known. The aim of this study is to investigate the efficacy of analgesia with 4 mg or 2 mg Dexamethasone added to a combination of ropivacaine 0.5% and lidocaine 1% on vertical infraclavicular blockade (VIB) anaesthesia for upper limb surgery.

Methods: After Ethics Committee approval 75 patients ASA I-III were randomized in 3 groups: Placebo-10 ml ropivacaine 1% + 10 ml lidocaine1% + 1 ml saline, D1 – the same volume of drugs + 4mg Dexamethasone and D2 – the same volume + 2mg Dexamethasone.VIB was performed under the ultrasound and neurostimulation in order to maintain the homogeneity of the procedure. At first analgetic requirement the patients received intravenous perfalgan 1g and lornoxicam 8 mg peros. If after 30 minutes, VAS was over 3 we start our morphine titration protocol. We recorded the time interval from the blockade performance until the first rescue analgesic dose, the pain intensity at the sensory blockade resolution, the total amount of morphine in the first 24 hours.

Results: Both groups D1 and D2 were significantly different from Placebo regarding the time interval until first analgesic dose required (p<0.0161 Anova) but no significant differences between D1 and D2. The morphine consumption in first 24 hours was significantly lower in both D groups versus Placebo.

Conclusions: Perineural administration of 2 mg of dexamethasone significantly prolongs the duration of postoperative analgesia and it is as efficient as the 4 mg dose.

E-POSTER DISCUSSION SESSION 02: PERIPHERAL NERVE BLOCKS I

ESRA7-0329

COMPARISON OF EFFECTS OF PERIPHERAL NERVE BLOCK AND SPINAL ANESTHESIA ON CORE BODY TEMPERATURE (PROSPECTIVE, RANDOMIZED STUDY)

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Background and Aims: Peripheral nerve blocks (PNB) have several benefits compared with spinal anaesthesia. However, as far as we know, there is no prospective randomized study to investigate the effect of PNB on the core body temperature. Therefore, we evaluated the effect of PNB on the core body temperature compared to spinal anaesthesia.

Methods: After obtaining institutional approval and written informed consent from all patients, sixty patients who underwent below knee surgery were recruited and allocated randomly into two groups: Peripheral nerve block group (n = 30) and spinal anaesthesia group (n = 30). In the spinal anaesthesia group, patients were received spinal anaesthesia with 0.5% hyperbaric bupivacaine. And in the PNB group, femoral nerve and sciatic nerve were blocked with 0.375% ropivacaine. The body temperature was measured ten times in both ears every 15 minutes with an ear thermometer for 1 hour. The primary endpoint was the body temperature at 1 hour after anesthesia.

Results: The initial body temperature was different in the both groups. However, the body temperatures at 30 min (36.34 ± 0.24°C vs. 36.62 ± 0.25°C), 45 min (36.17 ± 0.24°C vs. 36.51 ± 0.23°C), and 60 min (36.03 ± 0.26°C vs. 36.43 ± 0.27°C) after anesthesia were low in the spinal anesthesia group (P < 0.01).

Conclusions: The body temperature at 1 hour after anesthesia is low in the spinal anesthesia group compared to the PNB group. This suggests that PNB is an effective anesthetic way to maintain the body temperature than spinal anesthesia.

E-POSTER DISCUSSION SESSION 02: PERIPHERAL NERVE BLOCKS I

ESRA7-0161

PECS II BLOCK: ANALGESIC EFFECT AND CHRONOLOGICAL ROPIVACAINE CONCENTRATION AFTER UNILATERAL MASTECTOMY AND AXILLARY CLEARANCE

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Background and Aims: PECS II block is the truncal block of choice for mastectomy with axillary clearance (MAC). The commonly administered LA dose for this block is 30ml ropivacaine 0.5%. To our knowledge, there has been no published data on chronological ropivacaine concentration after PECS II block

Methods: We aimed to measure the safety level of ropivacaine and analgesic efficacy for PECS II block using the recommended dose.

Results: Six patients were recruited: mean age, 62.6 (±7.1) years; ASA Grade 1-3; mean BMI, 26.8 (±2.3) kgm−2; mean age, 62.6 (±7.1) years; ASA Grade 1-3; mean BMI, 26.8 (±2.3) kgm−2; mean age, 62.6 (±7.1) years; ASA Grade 1-3; mean BMI, 26.8 (±2.3) kgm−2; mean age, 62.6 (±7.1) years; ASA Grade 1-3; mean BMI, 26.8 (±2.3) kgm−2; mean age, 62.6 (±7.1) years; ASA Grade 1-3; mean BMI, 26.8 (±2.3) kgm−2; mean age, 62.6 (±7.1) years; ASA Grade 1-3; mean BMI, 26.8 (±2.3) kgm−2. The mean peak venous plasma concentration (Cmax) was 2.12 (±0.41) μg/ml−1. The mean time point of maximum concentration (Tmax) of ropivacaine occurred at 40.8 (±16.9) min. All subjects received preemptive analgesia paracetamol 1g and celecoxib 200mg. The mean intraoperative morphine usage was 3 (±0.6) mg. Only one subject required additional 1mg morphine at recovery area and one required rescue analgesia subcutaneous morphine in the ward on POD1. The average pain score at recovery area and POD1 was 1 and 2 (±1).

Conclusions: The use of recommended dose 150mg ropivacaine in PECS II block for unilateral MAC in adult females is safe without exceeding the toxic level.

E-POSTER DISCUSSION SESSION 02: PERIPHERAL NERVE BLOCKS I

ESRA7-0017

PECTORAL NERVE BLOCK AND QUALITY OF POSTOPERATIVE RECOVERY IN PATIENTS UNDERGOING BREAST CANCER SURGERY: A RANDOMISED CONTROL TRIAL

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Background and Aims: Pectoral nerve (PECS) block is reportedly efficacious for reducing pain after breast cancer (BC) surgery. However, its effects in terms of quality of recovery remain unclear. In this study, we evaluated changes in the QoR-40 score with or without PECS block after BC surgery.

Methods: Sixty women undergoing BC surgery were randomly allocated to a PECS group that received a PECS II block using 30 ml of levobupivacaine 0.25% after induction of anaesthesia or a control group that received a saline-injected mock block. We evaluated the Numeric Rating Scale (NRS) score for postoperative pain and the QoR-40 score preoperatively, on postoperative day 1 (POD 1) and one month after surgery. We also compared postoperative food intake between the groups.

Results: PECS block combined with propofol-remifentanil anaesthesia did not improve the QoR score on POD 1 or intraoperative remifentanil consumption when compared with saline-injected mock block (QoR-40 global score [mean and 95% confidence interval]: 177 [170–184] vs. 170 [162–178]; remifentanil consumption [μg kg⁻¹ h⁻¹, mean and 95% confidence interval]: 10.5 [8.95–12.07] vs. 10.4 [8.77–12.12]) in the PECS group and control group, respectively), although postoperative NRS scores were significantly lower in the PECS group than in the control group. PECS block prevented decreased postoperative food intake.

Conclusions: PECS block combined with general anaesthesia did not improve the postoperative QoR-40 score in patients undergoing BC surgery, possibly because of incomplete PECS block in the internal mammary area or breakthrough pain after waning of the analgesic effect.

E-PAPER DISCUSSION SESSION 02: PERIPHERAL NERVE BLOCKS 1

ESRA7-0140

ANALGESIC QUALITY & MOBILISATION WITH US-GUIDED CONTINUOUS VS. SINGLE-INJECTION SCIATIC NERVE BLOCKADE FOR TOTAL KNEE ARTHROPLASTY (THE COSINUS TRIAL) - A RANDOMIZED, TRIPLE-BLIND STUDY

Hüttemann I.¹, Schilke N.², Heyse T.², Efe T.², Ebschbach D.², Wulf H.³, Feldmann C.³, Steinfeldt T.³, and Wiesmann T.². ¹Philips University, Anesthesiology & Intensive Care Medicine, Marburg, Germany; ²Philips University, Center of Orthopedics & Traumatology, Marburg, Germany; ³Diakonie Klinikum Schwäbisch Hall, Anesthesiology & Intensive Care Medicine, Schwäbisch Hall, Germany.

Background and Aims: Continuous femoral nerve blockade in combination with single-injection sciatic nerve blockade are the standard peripheral nerve block techniques after total knee arthroplasty (TKA). However, data is scarce regarding analgesic benefits of a continuous sciatic blockade regarding pain for more than 8 h after the operation. Mobilisation might be impaired by the continuous technique due to prolonged motor weakness.

Methods: After approval by the ethics committee, patients having total knee arthroplasty under general anaesthesia were randomized to receive a sciatic nerve catheter with an initial dose of 10 ml of ropivacaine 0.2% followed by continuous double-blinded application of 5 ml/h ropivacaine 0.2% (CON) or 5 ml/h saline in addition to a continuous femoral nerve blockade with 5 ml/h ropivacaine 0.2% (SIN). Morphine consumption, pain scores at rest & activity as well as mobilisation scores were determined during observation until postoperative day 3 (POD3).

Results: 50 patients were randomized, of which 48 data sets were analysed. Cumulative morphine consumption until POD3 was significantly different between groups (CON 18 mg (11-29) versus SIN, 47 mg (31-87.65), median (25th–75th percentiles), p = 0.0001). Overall pain scores were comparable at rest and during stress at each time point. However, significantly higher pain scores of the knee throat were found in group SIN. Preliminary data shows comparable mobilisation capability between groups regarding muscle function and mobilisation scores.

Conclusions: This trial shows superior analgesic quality using a continuous sciatic nerve block compared with single injection blockade in combination with a continuous femoral block for the first 72 h after the operation. Mobilisation was comparable between groups.

E-PAPER DISCUSSION SESSION 03: OBSTETRIC

ESRA7-0292

COMBINED SPINAL EPIDURAL (CSEA) VS. REMIFENTANIL ANALGESIA (RA) IN MULTIPAROUS: A PROSPECTIVE OBSERVATIONAL STUDY

Blażej I.¹, Lucowicz M.², and Stopar Pintaric T.¹. ¹University Medical Centre Ljubljana, Clinical Department of Anesthesiology and Intensive Therapy, Ljubljana, Slovenia; ²University Medical Centre Ljubljana, Department of Gynecology and Obstetrics, Ljubljana, Slovenia.

Background and Aims: Remifentanil may be an ideal drug for labour due to its pharmacodynamics/kinetic profile. As compared to EA, it demonstrated satisfactory for pain relief at the beginning of labor with a gradual elevation of pain scores as labour progresses. Fast onset and limited time efficacy may render it useful in multiparous with a faster labor progression, thus even making it an alternative to CSEA.

Methods: Students’s t test and Chi-square or Fisher’s exact test were used to compare CSEA with RA. Multivariable logistic regression examined the associations between analgesia and labour progress (cervical dilatation > 1.5 cm/hour vs. ≤ 1.5 cm/hour; duration of second stage < 60 min vs. ≥ 60 min), VAS (53 vs. ≥ 3); respiration (episodes of desaturation ≥ 94%), hemodynamics (decrease in SBP > 20 mmHg within 15 minutes), and neonatal outcomes (umbilical artery pH < 7.20 vs. ≥ 7.20) controlling for potential confounders: maternal age (>35 years), BMI (>30 kg/m²) and oxytocin use. P ≤ 0.05 was considered statistically significant.

Results: Each group counted 25 women. All delivered vaginally and all neonates had Apgar scores > 8. BMI and cervical dilatation at initiation of analgesia were statistically higher in remifentanil group (Table 1). VAS was significantly lower with CSEA. There were more episodes of desaturation with remifentanil. There were no differences in labor progress, hemodynamic status and neonatal umbilical artery pH between the groups (Table 2 and 3).
**Conclusions:** With respect to pain relief and potential for respiratory adverse effect, remifentanil cannot be an equivalent replacement for CSEA in multiparous.

### Table 1. Comparison of maternal characteristics between CSEA and remifentanil group.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Combined spinal epidural analgesia (n=25)</th>
<th>Remifentanil analgesia (n=25)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of previous deliveries</td>
<td>2 (±1)</td>
<td>2 (±1)</td>
<td>0.68</td>
</tr>
<tr>
<td>Age (years)</td>
<td>33 (±4)</td>
<td>31 (±3)</td>
<td>0.25</td>
</tr>
<tr>
<td>BMI (kg/m²)*</td>
<td>28 (±4)</td>
<td>30 (±3)</td>
<td>0.05</td>
</tr>
<tr>
<td>Gestational age (weeks)</td>
<td>39 (±1)</td>
<td>39 (±1)</td>
<td>0.99</td>
</tr>
<tr>
<td>Cervical dilatation at the time of analgesia initiation (cm)*</td>
<td>4.0 (±0.8)</td>
<td>4.4 (±0.6)</td>
<td>0.04</td>
</tr>
<tr>
<td>Systolic blood pressure at the time of analgesia initiation (mmHg)</td>
<td>118 (±16)</td>
<td>122 (±12)</td>
<td>0.39</td>
</tr>
</tbody>
</table>

Data are expressed as mean (± standard deviation); * Statistically significant (50.05); BMI body mass index.

### Table 2. Comparison of labor progress, VAS, maternal respiratory and hemodynamic status, and neonatal pH between CSEA and remifentanil groups.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Combined spinal epidural analgesia (n=25)</th>
<th>Remifentanil Analgesia (n=25)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cervical dilation &lt; 1.5 cm/hour</td>
<td>7 (28%)</td>
<td>9 (36%)</td>
<td>0.76</td>
</tr>
<tr>
<td>Oxytocin use to augment labor</td>
<td>24 (96%)</td>
<td>22 (88%)</td>
<td>0.61</td>
</tr>
<tr>
<td>Duration of 2nd stage of labor (minutes)</td>
<td>29.9 (±18.4)</td>
<td>25.0 (±19.0)</td>
<td>0.35</td>
</tr>
<tr>
<td>VAS*</td>
<td>1.7 (±2.0)</td>
<td>5.1 (±3.1)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Occurrence of maternal desaturation &lt;94%*</td>
<td>0 (0%)</td>
<td>8 (32%)</td>
<td>0.002</td>
</tr>
<tr>
<td>Decrease in maternal systolic blood pressure &gt;20 mmHg within 15 minutes of analgesia initiation</td>
<td>2(8%)</td>
<td>1 (4%)</td>
<td>0.55</td>
</tr>
<tr>
<td>Umbilical artery pH</td>
<td>7.24 (±0.08)</td>
<td>7.26 (±0.08)</td>
<td>0.29</td>
</tr>
</tbody>
</table>

Data are expressed as mean (± standard deviation) or n (%); * Statistically significant (50.05); VAS visual analogue scale.

### Table 3. Results of multivariate logistic regression analysis examining differences in labor progress, maternal status and neonatal outcomes between the two study groups accounting for potential confounders (maternal age, BMI, cervical dilation at initiation of analgesia, oxytocin use). OR odds ratio; CI confidence interval.

<table>
<thead>
<tr>
<th></th>
<th>Combined spinal epidural analgesia (n=25)</th>
<th>Remifentanil analgesia (n=25)</th>
<th>Adjusted OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VAS &gt; 3*</td>
<td>5 (20%)</td>
<td>18 (72%)</td>
<td>0.04 (0.02-0.55)</td>
</tr>
<tr>
<td>Cervical dilatation &lt; 1.5 cm/hour</td>
<td>7 (28%)</td>
<td>9 (36%)</td>
<td>1.20 (0.14-10.27)</td>
</tr>
<tr>
<td>Duration of second stage of labor ≥ 60 min</td>
<td>3 (12%)</td>
<td>1 (4%)</td>
<td>1.83 (0.00-1304.99)</td>
</tr>
<tr>
<td>Occurrence of maternal desaturation &lt;94%*</td>
<td>0 (0%)</td>
<td>8 (32%)</td>
<td>/</td>
</tr>
<tr>
<td>Decrease in maternal systolic blood pressure &gt;20 mmHg within 15 minutes of analgesia initiation</td>
<td>2 (8%)</td>
<td>1 (4%)</td>
<td>/</td>
</tr>
<tr>
<td>Umbilical artery pH ≥ 7.2</td>
<td>8 (32%)</td>
<td>7 (28%)</td>
<td>0.18 (0.01-3.38)</td>
</tr>
</tbody>
</table>

* Statistically significant

**E-POSTER DISCUSSION SESSION 03: OBSTETRIC**

**ESRA7-0083**

**COMPARING LUMBAR INTERVERTEBRAL DISTANCES USING ULTRASOUND IN AN OBSTETRIC POPULATION**

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**Background and Aims:** The interspaces in the lower lumbar spine have the highest rate of inconclusive sonograms in the transverse scanning plane. Obesity and the cephalad movement of Tuffier’s line in pregnancy compound this problem. We measured the intervertebral distances in the lumbar spine using...
ultrasound, to better understand the anatomy and explain why the quality of sonograms varies between intervertebral levels.

Methods: 48 term parturients were evaluated pre-operatively after having obtained informed consent. Two anaesthetists scanned the lumbo-sacral spines in a sitting position. The centre point of each space from L2 to S1 was marked in the paramedian sagittal oblique plane. The distance between each mark was measured.

Results: A total of 48 patients were scanned, with a mean age of 34 years and a BMI of 26 kg/m² (range 15-43 kg/m²). Two sample t-test showed the L3/L4 to L3/L2 intervertebral distance was greater than both the L5/S1 to L4/L5 and L4/L5 to L3/L4 intervertebral distances (mean SD) = 2.8±0.55cm vs 2.5 (0.42)cm and 2.6±0.55cm respectively, p = 0.0048.

Conclusions: Our data shows the L3/L4 to L3/L2 intervertebral distance is significantly wider than the lower intervertebral distances. This may explain why lower interspaces have poorer acoustic windows. During flexion of the spine to enlarge the intervertebral spaces, the lower lumbar spine is less mobile, leading to a narrower space. Combined with the obesity epidemic, it is easy to see why clinicians may stray cephalad when choosing the site for spinal anaesthesia.

E-POSTER DISCUSSION SESSION 03: OBSTETRIC

ESRA7-0178

CONTINUOUS RESPIRATORY MONITORING AFTER CAESAREAN SECTION WITH INTRATHECAL MORPHINE ANALGESIA - A PROSPECTIVE OBSERVATIONAL STUDY OF 100 CASES

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Background and Aims: Morphine is a drug commonly administered via the intrathecal route, owing to its prolonged postoperative analgesic efficacy. However, respiratory depression is a recognised perioperative side-effect. ASA recommends monitoring patients hourly for the first 12 hours. We performed routine postoperative monitoring including hourly evaluation of respiratory rate (RR) (determined by nurses), state of consciousness and continuous oxygen saturation (SpO2) and pulse rate determined by pulse oximetry. Additionally, oximetry-derived RR (PM1000N, Medtronic, Tokyo, Japan) monitor was demonstrated to provide accurate respiratory rates. This study aimed to estimate the incidence of respiratory depression and hypoxaemia.

Methods: A prospective observational study, approved by the Research Ethics Committee, in which 109 patients were enrolled, was conducted at our institution between August 2016 and January 2017. Intrathecal 100 μg morphine, 25 μg fentanyl and 10 mg hyperbaric bupivacaine were administered for caesarean section. We used PM1000N to continuously record RR and pulse oximetry overnight. We defined RR less than 10 as mild respiratory depression, RR less than 8 as severe respiratory depression, and SpO2 less than 90% as hypoxaemia. The study was Institutional Ethics Committee approval and written informed patients consent.

Results: Data were collected from 100 patients; nine patients were excluded due to data loss and consent withdrawal). Eighty-five patients(85%) exhibited mild respiratory depression, of which 62 patients(62%) developed severe respiratory depression and 11(11%) patients developed hypoxaemia by the next morning. No patients required medical intervention by a doctor.

Conclusions: With the pulse oximetry-derived RR monitor, the incidence of respiratory depression in our study was higher than that recorded in previous studies.

E-POSTER DISCUSSION SESSION 03: OBSTETRIC

ESRA7-0093

INTRODUCING NEURAXIAL ULTRASOUND WITHIN A GENERAL DISTRICT HOSPITAL MATERNITY DEPARTMENT

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Background and Aims: The parturient can provide specific challenges with regard to both providing spinal anaesthesia and placing epidural catheters. The use of ultrasound (US) for neuraxial imaging has been shown to both increase the success of such procedures whilst reducing potentially devastating complications.

The aim of this project was to introduce the technique and benefits of pre-procedural US within our maternity department. This included the 10 day loan of a Logiq S8 US from GE Healthcare.

Methods: Prior to the loan of the US machine, local teaching sessions were organised, led by anaesthetists experienced in scanning of the spine. Questionnaires were completed by attendees before and after the teaching sessions. A 5 point scale from Strongly Agree to Strongly Disagree was used (Fig 1).

Questions used in questionnaire:

1. Grade
2. Prior to attending any teaching sessions I was confident in the use of ultrasound for neuraxial anaesthesia
3. Having attended a departmental teaching session I am more confident in the use of ultrasound in neuraxial anaesthesia
4. I believe a dedicated ultrasound machine would be beneficial in the maternity department

Answer choices for questions 2-4: Strongly agree
 Agree
 Neutral
 Disagree
 Strongly disagree

FIGURE 1.

Results: 100% of the 15 anaesthetists attending teaching sessions reported an increase in confidence in the use of neuraxial US with a mean increase of 2.4 points on the 5 point scale. (Fig 2 and 3). NB: One attendee increased from Disagree to Neutral.

FIGURE 2.

FIGURE 3.
Following the loan period of the Logiq S8, 79% of consultants asked, either agreed or strongly agreed that a dedicated US machine would be beneficial within the maternity department.

Conclusions: We have demonstrated the successful introduction of pre-procedural neuraxial US within our maternity department with all teaching sessions attended feeling more confident in the use of the technique. A successful loan period of a dedicated US machine led to the clear majority of consultants who interact with maternity services feeling a permanent machine would be beneficial.

E-PMASTER DISCUSSION SESSION 03: OBSTETRIC

ESRA7-0443

RANDOMIZED CONTROLLED TRIAL WITH PRILOCAIN AND 2-CHLOROPROCAINE IN HEALTHY PARTURIENTS UNDERGOING AN ELECTIVE CAESAREAN SECTION WITH AN UNCOMPLICATED SINGLETON PREGNANCY BY COMBINED SPINAL EPIDURAL ANESTHESIA

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Background and Aims: Spinal chloroprocaine and prilocaine were the subject of multiple studies in ambulatory setting and have shown to be safe and well suitable because of their predictable time of motor and sensory block. Only one study evaluated the use of chloroprocaine for caesarean delivery. Concerning the use of spinal prilocaine for caesarean delivery we have found no prior data.

Methods: Sixty patients with ASA physical status I – II scheduled for elective caesarean delivery of uncomplicated singleton pregnancy were randomized into three groups : group P prilocaine 60 mg, group P + S 60 mg prilocaine and 5 mcg sufentanil and group C + S 40 mg chloroprocaine and 5 mcg sufentanil.

Results: Group P experience significantly higher pain scores at both externalization and internalization. The time for regression of motor block was highest for P + S (104.2 ± 20.2). This was significantly different from C + S (76.8 ± 13.1 min ; P < 0.001). No significant difference was seen with P (95.75 ± 24.99; P = 0.585). Significant difference was also shown between P and C + S (P = 0.015). There was no difference in the time for regression of sensor block between the different anaesthesia groups. P (124.0 ± 19.10), C + S (111.1 ± 19.05), P + S (127.6 ± 26.21).

Conclusions: Both spinal chloroprocaine and prilocaine have a suitable profile for caesarean delivery in terms of time of on- and offset and pain relief without major haemodynamic fluctuations or side effects. Because of their characteristics they could be useful to implement enhanced recovery protocols for caesarean delivery to promote direct skin to skin contact and early start of breastfeeding.

E-PMASTER DISCUSSION SESSION 03: OBSTETRIC

ESRA7-0070

LABOUR EPIDURAL AND MATERNAL FEVER

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Background and Aims: Epidural analgesia is regularly employed to effectively control labour pain, in our centre about 5000 patients in labour receive epidural every year. About 6% of them go on to develop fever (taken as > 37.5 degree Celsius in our institution). Epidural fever is associated with increased maternal and fetal morbidity, not to mention increased healthcare cost (1). Hence this cohort study aims to identify risk factors associated with epidural fever, using data obtained from neuraxial analgesia database from year 2012 (n = 5103) and 2013 (n = 5067).

Methods: A retrospective audit analysis was conducted using data from post-epidural review, consisting of demographic, obstetric and anaesthetic data from KK Women’s and Children’s Hospital from year 2012 and 2013. Outcomes including the incidence and potential univariate risk factors were identified to investigate the independent associated factors using multivariate logistic regression.

Results: The incidence of epidural fever is 5.9% (n = 600). Factors associated with epidural fever include nulliparity (OR = 1.935, P < 0.0001), number of breakthrough pain (OR = 0.858, p < 0.0001), volume of local anaesthetics for top up delivery (OR = 1.012, p = 0.0438), delivery mode compared with normal vaginal delivery [instrumental (OR = 1.54, p = 0.0872), caesarean section (OR = 1.58, p = 0.0286)], and side effects [shivering (OR = 1.778, p < 0.0001), itch (OR = 1.325, p = 0.0001), vomiting (OR = 1.738, p = 0.0014)].

Conclusions: The incidence of epidural fever in our institution was much lower than published reports (11-33%) (2) despite using a lower threshold for definition of fever. Independent associated factors are identified and could lead to further studies to stratify high risk patients and identify feasible preventive measures.

E-PMASTER DISCUSSION SESSION 04: POSTOPERATIVE PAIN MANAGEMENT 1

ESRA7-0407

THE EFFECT OF ADDING SUFENTANIL TO 0.5% HYPERBARIC BUPIVACAINE ON DURATION OF BRACHIAL PLEXUS BLOCKADE IN CHRONIC OPIUM ABUSERS: A RANDOMIZED CLINICAL TRIAL

Azimaragi O., and Movaffegh A. Tehran University of Medical Sciences, Anesthesiology and Critical Care, Tehran, Iran.

Background and Aims: Psychoactive substances have been consumed for thousands of years. Illicit demand for opioid and its derivatives is continuing to increase. The sensory and motor blockade behavior of brachial plexus block in long-term chronic opioid users is of great importance to anesthesiologists.

Methods: One hundred and twenty patients scheduled for elective upper extremity were studied.

1- Group A: no history of chronic opioid use and received 30 mL hyperbaric bupivacaine + 2 mL saline as placebo.

2- Group B: no history of opioid use and received 30 mL hyperbaric bupivacaine + 2 mL sufentanil (10 μg n = 30).

3- Group C: positive history of chronic opioid use and received 30 mL hyperbaric bupivacaine + 2 mL sufentanil (10 μg).

The onset and duration of sensory and motor blocks were compared between the four groups.

Results: The Duration of sensory and motor block times were significantly less in Group C (577.0 ± 40.1 min, 497.0 ± 34.8 min) and the longest duration of sensory and motor block was observed in group B (705.0 ± 43.8 min, 640.0 ± 32.5 min). The duration of sensory and motor block in group B(705.0 ± 43.8 min, 640.0 ± 32.5 min). was longer and statistically higher than group A (619.5 ± 48.0, 573.2 ± 31.5), the same trend was observed in group D (598.6 ± 53.2, 569.3 ± 39.9) over group C (577.0 ± 40.1 min, 497.0 ± 34.8 min) (p < 0.001, one-way ANOVA).

Conclusions: The length of sensory and motor blockade is shorter in chronic opioid abusers. Addition of 10 μg of sufentanil to hyperbaric bupivacaine in opioid addicts shortened the sensory and motor duration.

E-PMASTER DISCUSSION SESSION 04: POSTOPERATIVE PAIN MANAGEMENT 1

ESRA7-0257

QUADRATUS LUMBORUM BLOCK FOR POST OPERATIVE ANALGESIA IN ORTHOPAEDIC PELVIC RECONSTRUCTIVE SURGERY

Hird S., Ma S., Eeles A., Ranote P., and Parara T. St George’s University Hospitals NHS Foundation Trust, Anaesthetics, London, United Kingdom.

Background and Aims: Orthopaedic reconstructive surgery after pelvic trauma is associated with significant pain. Neuromuscular blockade is preferably avoided to allow the surgeons to test perineal sensation post operatively. We aim to demonstrate the effectiveness of QLB as part of multimodal analgesia in pelvic reconstructive surgery.

Methods: We conducted a retrospective study looking at isolated pelvic reconstructive surgery from October 2015 to August 2016. Notes were examined for analgesics administered, pain, nausea and sedation scores post operatively comparing those who had QLB, no regional blocks (NRB) and neuraxial blocks (NB).

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Results: A total of 37 patient notes were analysed. 9 received QLB, 23 no regional anaesthesia and 5 received neuroaxial block. The QLB group required less intrathecal morphine (4.7 mg vs 10.2 mg) and Sketamine (3.3 mg vs 12.5 mg) had less average total pain scores (0.36 vs 0.76) and required less PCA morphine (21.8 mg vs 36.9 mg) (Fig 1.) than the non QLB group. Sedation and nausea scores and length of stay in recovery were not significantly different.

Conclusions: QLB is a relatively low risk regional technique that can provide good intraoperative and postoperative analgesia for Orthopaedic pelvic reconstructive surgery. We failed to show a difference in sedation and nausea scores perhaps due to the small number of patients. QLB has now been included in our pelvic fracture multimodal analgesic pathway as a standard to be considered. Future studies aim to gather larger patient numbers and pain scores at outpatient follow up to assess the impact on chronic post surgical pain.

E-PARTY DISCUSSION SESSION 05: POSTOPERATIVE PAIN MANAGEMENT 1

ESRA7-0456

HTX-011, A LOCALLY ADMINISTERED ANALGESIC, REDUCES POSTOPERATIVE PAIN INTENSITY AND OPIOID USE THROUGH 72 HOURS ACROSS BONY AND SOFT TISSUE SURGICAL MODELS

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Background and Aims: Adequate postoperative pain management over the first 72 hours (72 h) is crucial to prevent adverse outcomes and reduce over-reliance on systemic opioids. Addressing an unmet need for a long-acting, non-opioid local analgesic, HTX-011 utilizes meloxicam to potentiate bupivacaine in an extended-release formulation with Biochronomer® technology. The clinical efficacy and safety of HTX-011 is under investigation across multiple bony and soft tissue surgical models.

Methods: As part of two double-blind, randomized, placebo-controlled, Phase 2 studies, subjects undergoing herniorrhaphy or bunectomy were randomized to receive a single dose of HTX-011, bupivacaine HCl, or saline placebo. Study endpoints included the area under the curve (AUC) of pain intensity scores, total opioid consumption, and proportion of opioid-free subjects through 72 h.

Results: Preliminary analyses included 56 herniorrhaphy and 180 bunectomy subjects. HTX-011 treatment resulted in significantly lower AUC of pain intensity scores than either bupivacaine or saline placebo at most time points (Table 1); total opioid consumption was significantly lower at most time points (Table 2). A greater proportion of herniorrhaphy (Her) and bunectomy (Bun) patients were opioid-free through 72 h with HTX-011 treatment (Her: 46.7%; Bun: 17.3%) than with bupivacaine (Her: 11.8%; P = 0.0032; Bun: 8.0%; P = 0.4877) or saline placebo (Her: 13.0%; P = 0.0491; Bun: 3.9%; P = 0.0106). The frequency of adverse events was comparable between all arms.

Table 1. Area Under the Curve of Pain Intensity Scores Over Time, Mean (SD)

<table>
<thead>
<tr>
<th>Time Frame, hours</th>
<th>HTX-011 300mg</th>
<th>Saline Placebo</th>
<th>Pvalue</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-24</td>
<td>82.8 (64.2)</td>
<td>146.4 (51.9)</td>
<td>0.0014 v P</td>
</tr>
<tr>
<td>0-48</td>
<td>174.2 (125.1)</td>
<td>290.7 (99.1)</td>
<td>0.0025 v P</td>
</tr>
<tr>
<td>0-72</td>
<td>254.7 (201.2)</td>
<td>416.3 (156.2)</td>
<td>0.0009 v P</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time Frame, hours</th>
<th>HTX-011 50mg</th>
<th>Saline Placebo</th>
<th>Pvalue</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-24</td>
<td>101.6 (52.9)</td>
<td>154.7 (49.2)</td>
<td>&lt;0.0001 v P</td>
</tr>
<tr>
<td>0-48</td>
<td>224.6 (100.6)</td>
<td>309.3 (105.5)</td>
<td>&lt;0.0001 v P</td>
</tr>
<tr>
<td>0-72</td>
<td>332.4 (153.6)</td>
<td>434.1 (167.9)</td>
<td>0.0003 v P</td>
</tr>
</tbody>
</table>

BVP, bupivacaine; P, saline placebo.
ESRA7-0300
THE EFFECT OF IBUPROFEN ON POSTOPERATIVE OPIOID CONSUMPTION FOLLOWING TOTAL HIP REPLACEMENT SURGERY
Gurkan Y.1, Yorukoglu H.U.1, Isik E.2, and Kuss A.1. 1Kocaeli University Faculty of Medicine, Department of Anesthesiology and Reanimation, Kocaeli, Turkey. 2Kocaeli University Faculty of Medicine, Department of Orthopedics and Traumatology, Kocaeli, Turkey.
Background and Aims: Following hip surgery postoperative pain can be severe. Nonsteroidal anti-inflammatory drugs are used for postoperative pain treatment to reduce opioid consumption. Our aim was to investigate the effect of ibuprofen on postoperative opioid consumption following total hip replacement surgery.
Methods: Patients undergoing elective total hip replacement under general anesthesia were included into this randomized, prospective and double blinded study. 40 ASA I-II patients were randomized to receive 800 mg IV ibuprofen every 6 hours or placebo. At the end of surgery all patients were also administered tramadol 100 mg IV and paracetamol 1 gm IV. In the postoperative period, all patients were provided with morphine PCA. Patient controlled analgesia device was set to deliver 1 mg bolus dose and had 8 minutes of lock out period and 6 mg one hour limit. VAS scores were recorded at 1,6,12 and 24 h postoperatively. The incidence of nausea and vomiting, total morphine consumption during the 24 h postoperative period was recorded. Mann-Whitney U and Chi square tests were used for statistical analysis.
Results: VAS score at postoperative 24 h was lower at the ibuprofen group (p=0.006). Morphine consumption at 24 hours was significantly lower at the ibuprofen group compared to control group (p=0.026) (mean doses were 16 mg and 24 mg respectively). 5 patients in the control group and 3 patients in the ibuprofen group had vomiting. No other side effects or complications were observed.
Conclusions: Following total hip replacement surgery administration of ibuprofen IV reduced morphine consumption significantly.

ESRA7-0168
STELLATE GANGLION BLOCK NEW MODALITY FOR ACUTE POST-OPERATIVE PAIN RELIEF IN HUMERUS FRACTURE SURGERIES
Azer R.1, El-tolamy S. A.2, Sowan Z.2, and Mahrose K.2. 1Ulub-Emmius-Klinik, Anesthesia Department, Juirich, Germany; 2Faculty of Medicine- Zagazig University, Anesthesia Department, Zagazig, Egypt.
Background and Aims: The role of the sympathetic nervous system is well established in patients with chronic pain. In contrast, little is known about involvement of the sympathetic nervous system in acute somatic pain pathways, so, we undertook a randomized controlled study to show the role of stellate ganglion block in acute postoperative pain relief after upper limb orthopedic surgeries.
Methods: Sixty four patients scheduled for humerus fracture surgeries were administered preoperative ultrasound guided stellate ganglion block at C7 level with either 5 ml ropivacaine 0.75% or 5 ml saline (Double blinded study). Following the block, all patients received standardized general anesthesia. Hemodynamic variables, visual analogue scale and total analgesic consumption (ketorolac and paracetamol) were assessed in the 1st and 2nd Post-operative days. Any adverse effects were recorded.
Results: Postoperative visual analogue scale and total analgesic consumption were significantly reduced in patients received stellate ganglion block with ropivacaine (P-value < 0.05) with more stabilization of the hemodynamic parameters for the first postoperative 48 hours.
Conclusions: Sympathectomy in the form of preoperative stellate ganglion block has a significant role in acute post-operative pain relief after orthopedic surgery in the upper arm with decrease in the post-operative analgesic requirements.

Table 2. Total Postoperative Opioid Consumption Over Time, Mean MME (SD)

<table>
<thead>
<tr>
<th>Hours post dose</th>
<th>HTX-011</th>
<th>Saline Placebo</th>
<th>BPV HCI</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-24</td>
<td>7.8 (10.3)</td>
<td>15.1 (10.9)</td>
<td>12.3 (8.6)</td>
</tr>
<tr>
<td>0-48</td>
<td>12.0 (17.4)</td>
<td>22.5 (15.9)</td>
<td>17.6 (14.4)</td>
</tr>
<tr>
<td>0-72</td>
<td>16.1 (26.7)</td>
<td>27.6 (21.1)</td>
<td>21.4 (17.5)</td>
</tr>
</tbody>
</table>

Conclusions: HTX-011, a novel locally administered analgesic, was well tolerated and reduced postoperative pain and opioid use through 72 h compared with bupivacaine or saline placebo. These preliminary results demonstrate the versatility of HTX-011 analgesia across surgical procedures.

ESRA7-0413
COULD THE ULTRASOUND-GUIDED CONTINUOUS ERECTOR SPINAE PLANE BLOCK BE A GOOD CHOICE FOR POSTOPERATIVE ANALGESIA IN VIDEO-ASSISTED THORACOSCOPIC LOBECTOMY? A CASE REPORT
Scimia P.1, Basso Ricci E.2, Rizzi E.3, Giordano C.1, Petrucci E.2, Di Carlo S.2, Marinangi F.1, Pierfrancesco E.1. 1Hospital of Cremona, Department of Anesthesiology and Perioperative Medicine, Cremona, Italy; 2S.S. Filippo and Nicola Hospital of Avezzano, Department of Anesthesia and Intensive Care Unit, L’Aquila, Italy; 3San Salvatore Academic Hospital of L’Aquila, Department of Anesthesia and Intensive Care Unit, L’Aquila, Italy.
Background and Aims: The ultrasound-guided Erector Spinae Plane Block (US-ESPB) is a novel regional technique which may determine a multidisciplinary analgesia of the thoracic wall, by blocking the dorsal and ventral rami of the thoracic spinal nerves, as suggested by cadaveric studies. We described a continuous US-ESPB performed in a patient underwent video-assisted thoracic surgery (VATS) lobectomy.
Methods: A 55 year-old patient, ASA 2, underwent VATS lobectomy. Written informed consent was obtained. After induction of anaesthesia, we performed a continuous US-ESPB at level of T5 transverse process, by injecting 20 ml of 0.5% Ropivacaine deep to the erector spinae muscle, followed by placement of a catheter into the same plane. Before the end of surgery, 1 g of acetaminophen and Ketorolac 30 mg were intravenously administered. Patient was subsequently placed on perineural patient-controlled analgesia (PCA), with catheter infusion of 0.20% Ropivacaine at 8 ml/h, bolus 5 ml and lockout period 60 minutes.
Results: In the first 48 hours after surgery patient a good quality pain relief (NRS <4). He received a total of 6 g of acetaminophen and 90 mg of ketorolac, without opioids needing. Catheter infusion was discontinued on the third postoperative day. No complications were recorded postoperatively.
Conclusions: This case report showed that a continuous US-ESPB may represent a more simple and safe alternative to conventional regional techniques, such as epidural analgesia or thoracic paravertebral block, for VATS lobectomy. This technique also lends itself well to insertion of an indwelling catheter, which can be used to extend the duration of postoperative analgesia as needed.

ESRA7-0505
E-PAPER DISCUSSION SESSION 04: POSTOPERATIVE PAIN MANAGEMENT 1

ESRA7-0168
STELLATE GANGLION BLOCK NEW MODALITY FOR ACUTE POST-OPERATIVE PAIN RELIEF IN HUMERUS FRACTURE SURGERIES
Azer R.1, El-tolamy S. A.2, Sowan Z.2, and Mahrose K.2. 1Ulub-Emmius-Klinik, Anesthesia Department, Juirich, Germany; 2Faculty of Medicine- Zagazig University, Anesthesia Department, Zagazig, Egypt.
Background and Aims: The role of the sympathetic nervous system is well established in patients with chronic pain. In contrast, little is known about involvement of the sympathetic nervous system in acute somatic pain pathways, so, we undertook a randomized controlled study to show the role of stellate ganglion block in acute postoperative pain relief after upper limb orthopedic surgeries.
Methods: Sixty four patients scheduled for humerus fracture surgeries were administered preoperative ultrasound guided stellate ganglion block at C7 level with either 5 ml ropivacaine 0.75% or 5 ml saline (Double blinded study). Following the block, all patients received standardized general anesthesia. Hemodynamic variables, visual analogue scale and total analgesic consumption (ketorolac and paracetamol) were assessed in the 1st and 2nd Post-operative days. Any adverse effects were recorded.
Results: Postoperative visual analogue scale and total analgesic consumption were significantly reduced in patients received stellate ganglion block with ropivacaine (P-value < 0.05) with more stabilization of the hemodynamic parameters for the first postoperative 48 hours.
Conclusions: Sympathectomy in the form of preoperative stellate ganglion block has a significant role in acute post-operative pain relief after orthopedic surgery in the upper arm with decrease in the post-operative analgesic requirements.

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The median TTFR did not significantly differ between the tourniquet and non-tourniquet group (respectively 240 vs. 282 minutes). Median oxycodone consumption was significantly higher in the tourniquet group (50 vs 40 mg, p = 0.01).

Conclusions: Perioperative use of a tourniquet is associated with higher opioid consumption after TKA, indicating that the effect of a tourniquet on thigh pain is larger than the possible reduction in duration and intensity of LIA when surgery is performed without a tourniquet.

### E-POSTER DISCUSSION SESSION 05: POSTOPERATIVE PAIN MANAGEMENT 2

**ESRA7-0035**

**THE EFFECT OF LOW PRESSURE PNEUMOPERITONEUM AND PULMONARY RECRUITMENT MANEUVER ON POSTOPERATIVE PAIN AFTER LAPAROSCOPIC CHOLECYSTECTOMY**

**Depuydt E.**¹, Casier I.², Mathieu D.³, Vansteeneste K.³, Pottel H.⁴, and Van de Velde M.⁵ 
AZ Groeninge/UZ Leuven, Anesthesiology, Kortrijk, Belgium, ²AZ Groeninge, Anesthesiology, Kortrijk, Belgium, ³AZ Groeninge, Abdominal Surgery, Kortrijk, Belgium, ⁴AZ Groeninge, ICU Leaven, KULAK, Public Health and Primary Care, Kortrijk, Belgium, ⁵University Hospitals Leuven, Anesthesiology, Leuven, Belgium.

**Background and Aims:** Previous studies have shown that either a low pressure pneumoperitoneum or a pulmonary recruitment maneuver can reduce pain after laparoscopic cholecystectomy (lap CCE). We hypothesized that the combination of both could lead to an additional reduction in postoperative pain compared to a low pressure pneumoperitoneum alone. Primary outcome was pain relief during the first 24 h. Secondary outcomes included total analgesic use during first 24 h, nausea/vomiting, recovery score after 48 h and length of hospital stay.

**Methods:** A prospective randomized controlled single-blind trial was done in 80 electively scheduled ASA I-II patients. Lap CCE was performed with low pressure pneumoperitoneum (8-10 mmHg) in all patients. In group 2 a pulmonary recruitment maneuver was done at the end of surgery (insufflation ports open, 30° Trendelenburg position, manual ventilation 2×5 s at max 40cmH2O pressure), group 1 had no recruitment maneuver. General anesthesia and intra-operative analgesia were standardized. Postoperative pain was measured using the visual analogue scale (VAS) at fixed time points for 24 h. Analgesia at the PACU and ward was also standardized. Group sample sizes of 37 & 37 were calculated to achieve 80% power to detect a difference of 1 point in VAS score at a significance level of 0.05.

**Results:** Demographics were similar in both groups. After dropout we had 39 & 38 patients in respectively group1 & 2. We found no significant differences amongst groups in VAS scores during the first 24 h postoperatively. Secondary outcomes weren’t significantly different either.

### Table 2: Secondary outcomes in group 1 & 2

<table>
<thead>
<tr>
<th>Table 2: Secondary outcomes in group 1 &amp; 2</th>
<th>Group 1 (n=39)</th>
<th>Group 2 (n=38)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total installed consumption (mg)</td>
<td>13 (7.5)</td>
<td>12.8 (6.2)</td>
<td>0.608</td>
</tr>
<tr>
<td>Total intraop analgesia consumption (mg)</td>
<td>125 (80)</td>
<td>128 (73)</td>
<td>0.368</td>
</tr>
<tr>
<td>Recovery score (0-100)</td>
<td>13</td>
<td>9</td>
<td>0.451</td>
</tr>
<tr>
<td>Pain on awakening (0-100)</td>
<td>3</td>
<td>5</td>
<td>0.481</td>
</tr>
<tr>
<td>Length of hospital stay (hours, median with IQR range)</td>
<td>25.5 (7.5)</td>
<td>26.2 (5.4)</td>
<td></td>
</tr>
</tbody>
</table>

Conclusions: The present study demonstrates that a pulmonary recruitment maneuver does not provide additional analgesia or other advantages in patients already receiving low pressure pneumoperitoneum for lap CCE.
blockade compared with epidural analgesia or femoral nerve block. In this study, we evaluated the analgesia provided by continuous adductor canal block (ACB) after UKA, in addition to single-dose LIA.

**Methods:** After obtaining institutional ethics committee approval, forty patients were included in this double-blind randomized controlled trial. All patients experienced spinal anesthesia and single-dose LIA during the operation. An ultrasound-guided ACB catheter was placed postoperatively in the adductor canal at mid-thigh level. Patients were randomized into 2 groups: Group Rp (Background infusion: 0.2% ropivacaine 3ml/h, PCA:3ml each time, Locktime 30min) or Group Con (the same program setting with saline) for 48h postoperatively. The primary end point was worst pain on movement in the operated knee during 24h postoperatively.

**Results:** Worst pain scores on movement and at rest during 24h postoperatively were significantly lower in Group Rp (mean NRS ± SD, 3.73±1.09 vs 5.30±0.94, P<0.05; 1.78±1.08 vs 2.76±0.60; P<0.05). Breakthrough pain occurred later in the Group Rp (19[range, 4–46]hours vs 10[range, 3–24]hours; P=0.001). In addition, pain scores at rest and on movement at 8, 12, 24 and 48 hours were significantly higher in Group Con. All patients were able to ambulate on the day of surgery without motor blockade. No significant differences were found in opioids consumption during 48h postoperatively.

**Conclusions:** The combination of single-dose LIA with continuous ACB offered better pain relief without motor weakness after UKA surgery.

**FIGURE 1.** The worst pain values are as expressed as mean NRS±SD. *significant at level 0.05

**FIGURE 2.** Values are expressed as median [range] hours. X= means hours. (significant at level 0.05 P<0.05).

**FIGURE 3.** The worst pain values are as expressed as mean NRS±SD for pain assessment during 48h postoperatively. *significant at level 0.05

**FIGURE 4.** The worst pain values are as expressed as mean NRS±SD for pain assessment during 48h postoperatively. *significant at level 0.05

**E-POSTER DISCUSSION SESSION 05: POSTOPERATIVE PAIN MANAGEMENT 2

ESRA7-0040

EVALUATING ROLE OF DEXMEDETOMIDINE IN IMPROVING THE ANALGESIC PROFILE OF THORACIC PARAVERTEBRAL BLOCK AND POSTOPERATIVE PULMONARY FUNCTIONS IN THORACOTOMY SURGERIES: A RANDOMIZED PROSPECTIVE CLINICAL TRIAL

Mahran E., and Elsayed Hassan M. National Cancer Institute- Cairo, Anesthesia- ICU- Pain Therapy, Cairo, Egypt.

**Background and Aims:** Thoracic paravertebral block (TPB) is an effective method for management of post-operative pain. In this study we assumed that adding dexmedetomidine to paravertebral bupivacaine infusion could improve the analgesic quality and postoperative pulmonary functions after thoracotomy surgeries

**Methods:** Paravertebral catheter was introduced preoperatively by ultrasound guided technique in 40 patients scheduled for thoracotomy surgery. Patients were
allocated into 2 equal groups; Group B patients received a bolus dose of bupivacaine 0.25%/0.3 mg/kg followed by continuous catheter infusion of bupivacaine 0.125% at a rate of 0.1 ml/kg/hour. Group BD patients received a bolus dose of 1 μg/kg dexmedetomidine + bupivacaine 0.25%/0.3 mg/kg followed by continuous catheter infusion of dexmedetomidine at a rate of 0.2 μg/kg/hour + bupivacaine 0.125% at a rate of 0.1 ml/kg/hour. After same anesthetic protocol, patients were assessed for 24 hours for intraoperative fentanyl and post-operative morphine requirements. VAS score at rest and during cough, and pulmonary functions

**Results:** Intraoperative fentanyl consumption was less in group BD (80.75 ± 31.551μg) than group B (186 ± 39.683μg) with P-value < 0.001. Postoperative first 24 hours morphine consumption was less in group BD (295 ± 1986 mg) than group B (985 ± 3.468 mg) with P-value < 0.001. Postoperative pulmonary functions were better in group BD (table 2). However, VAS score at rest was comparable in the 2 groups (table 1)

**Conclusions:** Adding dexmedetomidine to paravertebral bupivacaine can provide better analgesia and postoperative pulmonary functions after thoracotomy surgeries.

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**E-POSTER DISCUSSION SESSION 05: POSTOPERATIVE PAIN MANAGEMENT 2**

**ESRA7-0198**

THE SPREAD OF SENSORY BLOCK PRODUCED BY PROGRAMMED INTERRUPTENT THORACIC PARAVERTERBAL BOLUS OF LEVOBUPIVACAINE: A PROSPECTIVE, RANDOMIZED, CONTROLLED, DOUBLE-BLIND TRIAL

**Murata H.1, Hida K.2, Ikitomiya T.2, Inoue H.2, Sato S.2, and Hara T.2**

Nagasaki University Graduate School of Biomedical Sciences, Department of Anesthesiology, Nagasaki, Japan, 2Nagasaki University School of Medicine, Department of Anesthesiology, Nagasaki, Japan, 3Nagasaki University Hospital, Clinical Research Center, Nagasaki, Japan.

**Background and Aims:** This randomized, controlled, double-blind trial compared the effectiveness of levobupivacaine delivery of a programmed intermittent paravertebral bolus with a continuous paravertebral infusion.

**Methods:** This study was approved from the Institutional Review Board of Nagasaki University Hospital. Using a computer-generated sequence, 32 consecutive patients who underwent unilateral video-assisted thoracic surgery were randomized to receive either a programmed intermittent paravertebral bolus of 10 ml of 0.2% levobupivacaine every 120 min (PIB group, n = 16) or a continuous paravertebral infusion of 0.2% levobupivacaine at 5 ml/h (CI group, n = 16). Postoperatively, mechanical infusion pump was set depending on the groups assigned after injection of 20 ml of 0.25% levobupivacaine through the paravertebral catheter. Patient-controlled intravenous fentanyl administration was also started. The primary outcome was the number of blocked dermatomes 24 h after initial bolus of levobupivacaine. The secondary outcomes included pain at rest and coughing, cumulative fentanyl consumption and acceptance of the analgesic technique. Arterial levobupivacaine concentration was measured to ensure the safety. P value < 0.05 was considered statistically significant.

**Results:** The number of blocked dermatomes 24 h after initial bolus of levobupivacaine (mean [95% confidence interval]) was larger in PIB group (3.1 [2.0-4.2]) than in CI group (6.8 [5.7-7.9]) (p < 0.001). No significant differences were observed in the secondary outcomes. The arterial levobupivacaine concentration did not reach a toxic level.

**Conclusions:** The programmed intermittent paravertebral bolus of levobupivacaine provides a wider dermatomal spread of sensory block than the continuous paravertebral infusion with an identical hourly dose of levobupivacaine.

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**E-POSTER DISCUSSION SESSION 06: CHRONIC PAIN MANAGEMENT 1**

**ESRA7-0428**

ULTRASOUND GUIDED GENICULAR NERVES PLUSSED RADIOFREQUENCY MODULATION VERSUS INTRA-ARTICULAR MODULATION IN PATIENTS WITH PRIMARY KNEE OSTEOARTHRITIS

**Elkaradawy S.1, Meghad N.1, Mostafa M.2, and Ellakany M.1,2**

1Medical Research Institute, Anaesthesia and Pain Management, Alexandria, Egypt, 2Egyptian Armed Forces, Anaesthesia and Pain Management, Alexandria, Egypt.

**Background and Aims:** Knee osteoarthritis (OA) is a progressive joint disease, characterized by pain, stiffness and muscle atrophy. Genicular nerves block or intra-articular local anesthetic injection reduces knee joint (KJ) pain but for short term. Pulsed Radiofrequency (PRF) neuro-modulation could enhance pain relief after successful diagnostic block.

Aim of the current study was to investigate 3 months effectiveness of genicular neuro-modulation or intra-articular modulation in patients with primary knee osteoarthritis.

**Methods:** The current coherent study was carried out on 50 patients with primary knee OA, grades 2 or 3 Kellgren–Lawrence classification. They divided randomly into two groups to receive either US guided genicular nerves PRF (Group 1) or intra-articular PRF (Group 2). The procedures were performed in two stages in the block room at Medical Research Institute, Alexandria, Egypt. Stage one was a diagnostic block, using a local anesthetic, either to block the genicular nerves or be injected intra-articular. In Stage two, pulsed radiofrequency was used if NRS declined to 50% or more. The primary outcome measured the degree of pain reduction in both groups, the secondary outcomes were concerned with patients’ functionality and the encounter complications.

**Results:** Patients’ characteristics were matched. Numerical Rating Scale of pain declined significantly in group 1, than group 2 at 1, 4 and 12 weeks. Western Ontario and McMaster Universities [WOMAC] Index of Osteoarthritis score for daily activities showed no significant difference in both groups.

**Conclusions:** Ultrasound guided genicular nerves PRF was more effective in reducing NRS of pain than intra-articular PRF for 3 months follow up period.

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**E-POSTER DISCUSSION SESSION 06: CHRONIC PAIN MANAGEMENT 1**

**ESRA7-0185**

LONGITUDINAL STUDY OF PAIN AREA CHANGES AND PARESTHESIA COVERAGE IN NEUROPATHIC PAIN PATIENTS

**Bains A., McDonald M., Lin S.**

Boston Scientific Corporation, Clinical Research, Valencia, USA.
Background and Aims: Spinal cord stimulation (SCS) often loses treatment effectiveness over time. However, pain assessment resolution is limited. For instance, “low back pain” may refer to several locations within the lower back. Thus, any long term increases in pain ratings may not be due to increasing pain in the same initial location(s). Therefore, we sought to determine the extent that existing pain patterns change over time and degree to which new patterns develop. Methods: Patients were implanted with commercially approved Boston Scientific SCS systems designed to relieve chronic pain. Pain drawings and parethesia coverage were taken at baseline, 6 and 12 Months with stimulator off. We performed analyses from 72 sites on 71 implanted patients from Baseline to 6 Months and 51 implanted patients from 6 to 12 Months. Pixel-by-pixel comparisons were used to see where in the body pain remained constant, where it was relieved, and where it newly appeared.

Results: For 50% of patients at each follow-up time point, >24% of their pain was new since previous time point. Roughly 66% of the evaluated patients showed a change in the number of pain areas from Baseline to 6 months, and 60.8% of patients exhibited a change in the number of pain areas from 6 to 12 months. Fifty percent of patients had >64% parethesia coverage of new pain in lower body at 6 or 12 Months.

Conclusions: New areas of pain occurred within 1 year for a subset of patients suggesting the likely need to address evolving changes in pain perception over time.

E-POTTER DISCUSSION SESSION 06: CHRONIC PAIN MANAGEMENT 1

ESRA7-0227

EVALUATING THE EFFECT OF THE SINGLE APPLICATION OF HIGH CONCENTRATION (8%) CAPSAICIN IN THE TREATMENT OF CHRONIC NEUROPATHIC PAIN

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Background and Aims: Topical high concentration (8%) capsaicin is used to treat neuropathic pain. Repeated application of capsaicin causes peripheral nociceptive desensitisation. The aim of the study was to assess the effect high concentrated capsaicin had on the reduction of symptoms in patients with chronic neuropathic pain.

Methods: This was a retrospective audit study. Twenty-one patients from July 2015 to March 2017 were included. The degree of pain reduction (expressed as a percentage) was grouped into no reduction, minimal reduction (1-29%), moderate (30-49%) and substantial (>50%). Patients were also asked how long the pain lasted for: short term (1-6 days), intermediate term (1-4 weeks) and long term (longer than a month). Ethical approval wasn’t required as advised by local policy.

Results: The majority of patients treated with high concentration capsaicin responded to treatment (72%). Six patients didn’t report any reduction in their pain. Forty-seven percent of the patients reported a good to substantial reduction in their symptoms after the single application of 8% capsaicin. A smaller proportion of patients (24%) said there was a mild reduction in pain. Thirty-three percent of the patients had pain relief lasting less than a week. Forty-seven percent of the patients reported a good to substantial reduction in their symptoms after the single application of 8% capsaicin. A smaller proportion of patients (24%) said there was a mild reduction in pain. Forty-seven percent of the patients had pain relief lasting less than a week. Results suggests 8% capsaicin has an important role in the treatment of chronic neuropathic pain. Single application of the capsaicin patches is useful for rapid delivery, which improves tolerability and avoids noncompliance.

E-POTTER DISCUSSION SESSION 06: CHRONIC PAIN MANAGEMENT 1

ESRA7-0137

UNCINATE PROCESS AREA AS A NEW SENSITIVE MORPHOLOGICAL PARAMETER TO PREDICT CERVICAL SPONDYLOSES

Kim YU. International St. Mary’s Hospital, Department of Anesthesiology and Pain Medicine, Incheon, Republic of Korea.

Background and Aims: Hypertrophy of the uncovertebral joint has been considered as a major cause of cervical spondylosis (CS). The cross-sectional area of the uncinate process is a key morphologic parameter in the identification of uncovertebral joint hypertrophy. Thus, to evaluate connection between CS and the uncinate process, we devised a new morphological parameter, called the uncinate process area (UPA). We hypothesized that the UPA is an important morphologic parameter in the diagnosis of CS.

Methods: Data of the UPA were collected from 146 patients with CS, 197 control subjects who underwent neck computed tomography (CT) as part of a routine medical examination. Neck CT images were obtained from all subjects. We measured the whole cross-sectional area of the bone margin of uncinate process at the C5-6 intervertebral disc level on CT using a picture archiving and communications system.

Results: The average UPA was 15.52 mm² in the control group, 29.97 mm² in the CS group. CS group were found to have significantly higher levels of the UPA. (p < 0.001). Regarding the validity of the UPA as predictors of CS, ROC curve analysis showed that the optimal cut-off point for the UPA was 21.15 mm², with 91.8 % sensitivity, 93.4% specificity, and area under the curve (AUC) of 0.972 (95% CI, 0.956-0.989) in the CS group.

Conclusions: We devised the UPA was a new sensitive parameter for assessing CS. A higher UPA is associated with higher possibility of CS. We think that this result will be helpful for diagnostic radiology in evaluating patients with CS.

E-POTTER DISCUSSION SESSION 06: CHRONIC PAIN MANAGEMENT 1

ESRA7-0293

KETAMINE MODULATES RESTING STATE FUNCTIONAL BRAIN CONNECTIVITY IN CHRONIC PAIN PATIENTS

Motoyama Y., Oshiro Y., Takao Y., and Mizobuchi S. Kobe University, Anesthesiology, Kobe, Japan.

Background and Aims: Background: Rapid and long term antidepressant effects of subanesthetic dose ketamine, an NMDA receptor antagonist, have been reported in depressed patients and a rodent neuropathic pain model. However, the clinical efficacy of ketamine for chronic pain and accompanying depressive symptoms has not been established. Recently, resting state functional MRI (rs-fMRI) studies have revealed the significant brain functional connectivity difference between chronic pain patients and healthy volunteers. Altered functional connectivity of the brain in chronic pain patients by ketamine infusion might be related to improvement of pain and depressive symptoms. In this study, we examined subanesthetic dose ketamine-induced change in the brain functional connectivity in chronic pain patients by using rs-fMRI.

Methods: METHODS: 18 chronic pain patients received 30 minutes intravenous infusion of subanesthetic dose ketamine (0.5 mg/kg). All patients underwent rs-fMRI before and after ketamine administration, and we compared the functional connectivity of the brain on all patient.

Results: After the administration of the ketamine, the negative functional connectivity between the Medial Prefrontal Cortex and the Parietal Operculum Cortex changed to positive functional connectivity. The positive functional connectivity between insula cortex and posterior cingulate gyrus was seen only after administration.

Conclusions: The changes of connectivity by ketamine administration in this study were observed in the areas involved in the resting state network and pain matrix. The ketamine administration to patients with chronic pain may improve the cognitive abnormality of the pain. We will analyze the correlation between the brain functional connectivity and the rating scale of pain before and after ketamine infusion.

E-POTTER DISCUSSION SESSION 07: PEDIATRIC

ESRA7-0249

MOTOR RESPONSE IN NEUROSTIMULATION-GUIDED PUDENDAL NERVE BLOCK: IS THAT REALLY NECESSARY?

Jarraya F., Bhir M., Ladhari C., Marzouk M., Ben Gayed K., and Ben Khalifa S. Beach Hamza Pediatric Hospital, Anesthesiology and Intensive Care, Tunis, Tunisia.

Background and Aims: Pudendal nerve block (PNB) has been demonstrated to be an efficient analgesic technique for penile surgery in children. The aim of this study was to check whether the success of blind pudendal nerve block could be predicted by the search for a motor response with neurostimulation.

Methods: After local ethics committee approval, we conducted this prospective study on children scheduled for elective penile surgery. PNB was performed following anatomical markers. Then, the operator stated, using neurostimulation,
whether a motor response occurred, as well as the minimal delivered intensity for which it persisted (MIN). At last, 0.1 mL/kg levobupivacaine 0.5% were administered bilaterally, regardless of neurostimulation response. Efficiency of the nerve block was assessed 15 minutes following local anesthetic (LA) administration. An increase above 20% in heart rate or systolic blood pressure was regarded as block failure.

Results: We enrolled 104 children aged 1 to 6 years, thus performing 208 blocks (2 blocks per patient). Success rate was about 97%, meaning that block failure was observed in only 3 children. The key finding of our study is that nearly all nerve blocks performed were successful, despite the absence of motor response in 52% of them.

Conclusion: In our study, motor response in PNB was not a necessary prerequisite condition to predict nerve block success. This might lead us to question ourselves: is there still any interest in resorting to neurostimulation to achieve PNB in children?

E-Poster Discussion Session 07: Paediatric

ESRA7-0096

THE ANALGESIC EFFECT OF CONTINUOUS TRANSVERSUS ABDOMINAL PLANE BLOCK VERSUS CAUDAL EPIDURAL ANALGESIA FOR ABDOMINAL SURGERIES IN PEDIATRIC PATIENTS

Ghoneim A., National Cancer Institute, Anesthesia and pain management, Cairo, Egypt.

Background and Aims: The analgesia provided by caudal block in pediatrics lasts only for the duration of action of the local anesthetics. The aim of this study was to compare between continuous transversus abdominis plane block and single dose caudal epidural analgesia regarding duration of analgesia, and postoperative pain in paediatrics.

Methods: Sixty paediatrics with renal nephroblastoma were randomly allocated into either C- group (caudal block was done at the end of surgery) or T- group (epidural catheter was inserted into the dissected plane between transversus abdominis and internal oblique muscles to receive continuous TAP block on the side of surgical incision). The primary endpoint was Duration of analgesia from time of discontinuation of anaesthesia till 1st intravenous morphine dose.

Results: The median time to the first narcotic requirement was significantly longer in T group (13 h). The mean morphine consumption in the first 24 hours postoperatively was significantly higher in C group. Meanwhile, the mean morphine consumption lowered significantly in the second postoperative day in both groups than that in the first day postoperatively. However, there was no significant difference between both groups in the same day.

Conclusion: Continuous transversus abdominis plane block as a part of multimodal analgesia has the potential to improve analgesia and reduces narcotic requirement within the first 24 h postoperatively more than the single dose caudal analgesia in paediatric patients undergoing abdominal surgeries.

E-Poster Discussion Session 07: Paediatric

ESRA7-0154

IRISH PERSPECTIVE OF CONTROVERSIAL ISSUES IN PEDIATRIC REGIONAL ANAESTHESIA (RA)

Irwin R., and Crowe S. Our Lady's Children's Hospital- Crumlin, Dept. of Anesthesia, Dublin, Ireland.

Background and Aims: The European Society of Regional Anaesthesia (ESRA) and American Society of Regional Anaesthesia (ASRA) developed a Joint Committee Practice Advisory on Controversial Topics in Paediatric Regional Anaesthesia. We created a survey to assess the Irish perspective of these four controversial topics.

Methods: A paper based survey was circulated to attendees at the Irish Paediatric Anaesthesia & Critical Care Society 19th Annual Scientific Meeting. Anaesthetic Consultants and Registrars with frequent paediatric practice were polled.

Results: There were 44 responses to our questionnaire, 18 consultants and 26 registrars.

Conclusion: Despite the recommendation (Evidence B4) of the Practice Advisory, greater than half of anaesthetists polled felt the risk of delaying Compartment Syndrome was significant and influenced their decision not to perform RA in at risk patients. We certainly need more high level data to provide greater guidance on this issue in both adult and paediatric practice.

E-Poster Discussion Session 07: Paediatric

ESRA7-0049

COMPARISON OF CAUDAL EPIDURAL BLOCK WITH PARAVERTEBRAL BLOCK FOR RENAL SURGERIES IN PEDIATRIC PATIENTS

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1All India Institute of Medical Sciences, Anesthesiology- Pain Medicine and Critical Care, New Delhi, India, 2All India Institute of Medical Sciences, Pediatric Surgery, New Delhi, India.

Background and Aims: Pediatric renal surgeries are associated with significant post-operative pain. Multimodal analgesic techniques, namely systemic and regional, have been used. Pediatric regional blocks are usually performed under general anesthesia. Ultrasound-guidance to perform the blocks ensures safety and success. This study was undertaken to compare the analgesic efficacy of ultrasound-guided single shot caudal block with ultrasound-guided single shot paravertebral block in children undergoing renal surgeries. Time to first analgesic requirement, 24-hour FLACC scores and analgesic consumption, parental satisfaction and the hemodynamics were studied.

Methods: After ethical committee approval and informed written parental consent, 50 children aged 2-16 years, of ASA status I/II, posted for elective renal surgeries were randomised into two groups (Group C-caudal block, Group P-paravertebral block), for a prospective single blind interventional study. Statistical analysis was done using STRATA 14.0 and SPSS 20.0. Chi-square/Fisher exact test, paired samples t-test, Mann-Whitney U test were used for comparisons between the two groups. Kaplan-Meier survival estimate was used for analysis of primary outcomes. p < 0.05 was considered significant.

Results: Demographics were comparable between both the groups. Children in Group P had significantly longer duration of analgesia (p < 0.0004) than Group C (Figure 1).

Conclusion: Post-operative FLACC scores (p < 0.0005), analgesic requirements (p < 0.0004) were lower in Group P. Parents in Group P reported greater satisfaction (p < 0.02). No complications were seen in either of the groups.

Conclusion: Paravertebral block can be considered as an alternative analgesic modality for renal surgeries in children. However, the block performance requires adequate expertise.
E-PAPER DISCUSSION SESSION 07: PAEDIATRIC

ESRA7-0162

COMPARISON OF CAUDAL BLOCK AND ULTRASOUND GUIDED Ilioinguinal/Iliohypogastric BLOCK FOR BILATERAL INGUINAL SURGERY IN PEDIATRIC PATIENTS: A PROSPECTIVE RANDOMIZED TRIAL

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Background and Aims: The aim of this study was to compare the efficiency of caudal block and ultrasound guided ilioinguinal/iliohypogastric nerve block for bilateral inguinal surgery in pediatric patients.

Methods: In this prospective randomized study, 115 pediatric patients between 1-10 years old who were scheduled for bilateral inguinal hernia surgery were enrolled in the study. The patients were randomly assigned to receive an ultrasound-guided ilioinguinal/iliohypogastric block group (n = 55) or caudal block group (n = 60). Ilioinguinal/iliohypogastric block was performed with 2 mg/kg bupivacaine as 0.25% and total volume were divided equally for each side. Caudal block was performed with bupivacaine 2 mg/kg as 0.2%. Supplemental analgesia consisted of as required intraoperative remifentanil, for recovery unit rescue tramadol, as required at home ibuprofen. Patients were evaluated in the recovery unit for analgesia with FLACC pain scale, analgesic requirement. Pain at 6, 12, 24 hours.

Results: FLACC scores in the recovery room were found significantly less in caudal block group (2.23 ± 3.06) than ilioinguinal/iliohypogastric block group (3.47 ± 3.63), (p = 0.03) only in first 10 minutes. There was no statistically different for mean amount of remifentanil usage during the surgery. The frequency of mean rescue remifentanil usage in early period and ibuprofen usage at home and parental satisfaction for caudal and ilioinguinal/iliohypogastric block group were similar.

Conclusions: Ultrasound guided ilioinguinal/iliohypogastric block provides similar postoperative analgesic effect and parental satisfaction for bilateral inguinal hernia surgery in pediatric patients. The block may have advantage to caudal block in day case patients

E-PAPER DISCUSSION SESSION 08: CASE REPORTS 1

ESRA7-0442

QUADRATUS LUMBOBRUM BLOCK (TYPE II) FOR POSTOPERATIVE PAIN MANAGEMENT AFTER PERCUTANEOUS NEPHROLITHOTOMY: CASE SERIES

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Background and Aims: The widespread use of ultrasonography in regional anesthesia in recent years; resulted with identification of new blocks such as quadratus lumborum block (QLB). QLB is a regional analgesic technique that blocks T6-L1 has an excellent role in postoperative pain management for lower abdominal surgeries. We performed a type II QLB for postoperative analgesia in 3 patients undergoing percutaneous nephrolithotomy (PCNL).

Methods: QL blocks were performed after surgery in operating room before reversal of neuromuscular blockade, using 30 ml of bupivacaine 0.25%. Patients received 1 g of paracetamol and 100 mg of tramadol. Pain was measured using a visual analogue score (VAS) (0, no pain; 10, worst pain imaginable) in recovery and at 6th, 12th, 18th, and 24th hours. VAS for pain was less than 4 for the 12 h period and patients had no need for additional analgesics for a post-block period of 12 hours.
Results: QLB provides prolonged postoperative analgesia in patients undergoing PCNL operations. Further randomized controlled trials are needed to enhance the efficacy of the QLB.

Conclusions: Renal pain is thought to be transmitted via nerves originating from T10 to L1. Blockade of unilateral this spinal nerve can provide sufficient analgesia after PCNL. Combination of opioids, non-steroidal antiinflammatory agents and regional methods; with different mechanisms of action in postoperative pain management is considered to be more effective for postoperative analgesia and minimizes side effects as well as reduced incidence of chronic pain.

E-POSTER DISCUSSION SESSION 08: CASE REPORTS 1

ESRA7-0032

CLAVICLE SURGERY UNDER REGIONAL ANAESTHESIA: A CASE REPORT


Background and Aims: To date, sensory innervation of the clavicle remains controversial. There are no randomized trials to determine the best option for anesth

Keo ship or analgesia for clavicle fracture. This case report illustrates the use of Regional Anaesthesia (RA) for surgical fixation of clavicle fracture.

Methods: The patient is a morbidly obese 30-year-old male, who was involved in a road traffic accident. He sustained right clavicle fracture, right scapula fracture and multiple right rib fractures. The patient was subsequently listed for open reduction and internal fixation of right clavicle fracture. In view of the patient profile and the injuries sustained, a pure RA technique would be more beneficial for the patient compared to General Anaesthesia (GA).

Utrasound-guided interscalene brachial plexus block and superficial cervical plexus block were performed for surgical anaesthesia. Patient consented for case report.

Results: Patient was assessed 30 minutes post block, which revealed loss of

Female, 58 years old, 37Kg, 1.60m, NY AH III, SpO2 70%. Under Regional Anesthesia and Pain Medicine subcostal approach - for hepatoblastoma.

A 7-month-old girl, 6.5 kg, ASA 3 underwent right partial

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E-POSTER DISCUSSION SESSION 08: CASE REPORTS 1

ESRA7-0427

CONTINUOUS SPINAL ANESTHESIA FOR SUBTOTAL GASTRECTOMY IN AN ADULT PATIENT WITH UNREPAIRED TETRALOGY OF FALLOT

Teixeira J.C., Correia MJL, Alba Y., and Chedas M. Centro Hospitalar Lisboa Ocidental, Anesthesiology, Lisbon, Portugal.

Background and Aims: We present a case of an adult patient with unrepaired Tetralogy of Fallot (TOF) scheduled for subtotal gastrectomy due to gastric adenocarcinoma. Anesthesia for major non-cardiac surgery of an adult patient with unrepaired TOF is challenging. Using continuous spinal anesthesia (CSA) for gastrectomy was not described in high-risk patients.

Methods: Female, 58 years old, 37Kg, 1.60m, NYAH III, SpO2 70%. Under ASA for secondary prevention. Hb 18.1 g/dl, Hct 56.6%, normal RÖTEM.

Echocardiogram revealed mildly reduced left ventricular function, unrestricted ventricular septal defect, pulmonary atresia, left ventricular hypertrophy, major aortopulmonary collateral arteries and descending aortic aneurism.

Multidisciplinary consensus decision was surgical treatment. The anesthetic approach included collaboration of hemotherapy and cardiology teams.

After placement of an arterial line and central venous catheter, we placed an

ultrasound-guided right QL Block with 4 mL of 0.375% ropivacaine and bilateral blockade of perineal neuroaxial block with 1mL of 0.75% ropivacaine were performed, without complications. During surgery, 100 mg of paracetamol and 1 mg of ondansetron were administered. Blood loss was estimated at 30 mL. Surgery lasted approximately 4 hours. The patient remained hemodynamically stable during intra and immediate postoperative period, without pain. For postoperative pain management, 1mL/h morphine plus 100 mg of paracetamol 6/6h and ibuprofen (SOS) were prescribed. Rescue analgesia during hospital stay was not necessary and the patient was discharged 5 days after surgery.

Conclusions: QL Block is an option for visceral and parietal abdominal analgesia. It enables intra-operative analgesia free of opioids and their side effects in 7-month-old infants. Despite the need for more studies, QL Block appears to be an effective alternative to the neuroaxial approach.

ESRA7-0167

SPINAL ANESTHESIA IN A 21-YEAR-OLD WOMAN WITH OSTEOMESIS IMPERECTA

Tajbakhsh A., Mirekeshi A., and Memary E. Imam Hossein Educational Hospital, Anesthesiology, Tehran, Iran.

Background and Aims: The choice of anesthetic technique in patients with osteogenesis imperfecta (OI) can be a challenge for anesthesiologists and must be adjusted based on specific circumstances and abnormalities. We report our anesthetic technique in an OI patient to emphasize this point, and to frame a discussion of this subject. According to the accessible data, we report one of the rare OI patients who have undergone spinal anesthesia for emergency surgery.

Methods: The patient was a 21-year-old female with OI type IV, who was admitted due to severe anal pain. The surgeon decided to perform an emergency reduction of a prolapsed rectum, with late permanent fixation.

Results: Considering the circumstances, we decided to perform spinal anesthesia for the operation, which lasted for 30 minutes. The patient underwent rectal prolapse reduction via rectosigmoidoscopy, of up to 25 cm of rectum. She was transferred to the post-anesthesia care unit after her vital signs were stabilized. After gaining lower extremity strength, she was transferred to the surgery ward. The next day, she was discharged from the hospital.

Conclusions: Although most authors believe that general anesthesia following fiberoptic intubation is the preferred method for OI patients, it is likely that spinal anesthesia is acceptable in such patients. Although it is technically difficult, the procedure can be performed by expert anesthesiologists.
E-POSTER DISCUSSION SESSION 08: CASE REPORTS 1

ESRA7-0061

CONTINUOUS BILATERAL PARAVERTEBRAL BLOCK FOR AN ELDERLY PATIENT WITH ASCENDING AORTIC DISSECTION PRESENTING FOR OPEN GASTRECTOMY

Zhang X., Goh S., and Thong S. Singapore General Hospital, Anaesthesiology, Singapore, Singapore.

Background and Aims: We rarely encounter patients with conservatively treated aortic dissection presenting for surgery. Bilateral paravertebral block (PVB) can provide excellent intraoperative and postoperative analgesia with stable hemodynamics and fewer contraindications compared to neuraxial anesthesia(1).

We report a case of successful perioperative pain management using continuous bilateral PVB catheter infusion in an 89-year-old patient who underwent open partial gastrectomy.

This patient was admitted for gastric adenocarcinoma with history of conservatively treated Stanford type A dissection (9.8*7.6 cm), chronic atrial fibrillation, asthma and hyperlipidemia.

Methods: Bilateral PVB catheters were inserted with patient in prone position under conscious sedation. Perfix Soft Tip 901 (B Braun®) epidural catheter set was used. T8-9 paravertebral space was located using continuous ultrasound guidance in the parasagittal axis (Sonosite Edge®, 15–6 MHz linear probe). An 18G Tuohy needle was inserted into paravertebral space and saline was used to distend and confirm needle tip placement. The catheter was then inserted, using the catheter-through-needle technique.

Operation was performed uneventfully under general anesthesia and PVB boluses of 0.5% ropivacaine (300 mg in total for 2 hours of surgery), with minimal requirement for systemic opioid. A continuous infusion of 0.2% ropivacaine (3ml/h) with 1.25mcg/ml fentanyl was started postoperatively.

Results: Postoperatively patient remained normotensive and pain free with regular paracetamol, no opioid required. She started ambulating on post-op day 2 and infusion rate was gradually titrated down in view of good compliance to physiotherapy. Catheters were removed on post-op day 4.

Conclusions: Bilateral continuous PVB achieves excellent analgesia and stable hemodynamics and should be considered in selected patients.

Reference:

E-POSTER DISCUSSION SESSION 09: MISCELLANEOUS 1

ESRA7-0272

THE KING’S WAY OF DOING A SERRATUS PLANE BLOCK; DROP THE COUNTING!

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Background and Aims: Serratus plane blocks (SPBs) were first described by Blanco et al. They described scanning in the mid-clavicular region and counting the ribs inferiorly and laterally until the 5th rib is identified in the mid-axillary line. They then identified the latissimus-dorsi and serratus muscles and injected the local anaesthetic above/below the serratus muscle.

Counting down ribs could be confusing, challenging and discouraging to some clinicians, especially non-frequent users of ultrasound. It could also be uncomfortable to patients with multiple chest wall injuries.

The success of serratus plane blocks relies mainly on correct identification of the plane in-between latissimus-dorsi and serratus (nerve traverse the plane in-between), and the volume of local anaesthetic used.

Our strategy involves simplifying the technique of performing SPBs to expand and encourage its safe utilisation by all teams and decrease morbidity and mortality rates associated with rib fractures.

Methods: We describe a simplified method of identifying the serratus plane, increasing its ease of performance and encouraging more clinicians to adopt it in their practice. In our technique, we skip counting ribs and immediately scan between the midclavicular and the posterior-axillary lines, in a sagittal plane, at the level of the nipple to as above. Once the muscles are identified, a Tuohy needle is introduced in the plane in-between them and the local anaesthetic injected.

Results: See images below.

Conclusions: We believe that the King’s method of performing SPBs is simple, safe and easy to teach. By simplifying the block technique, we hope to encourage more clinicians to utilise this block for rib fracture patients.
ORTHOPAEDIC THEATRE THROUGHPUT ENHANCEMENT BASED ON A MOBILE BLOCK ROOM MODEL - A QUALITY IMPROVEMENT PROJECT

Bird R., and Baxter I. Freeman Hospital, Anaesthetic Department, Newcastle upon Tyne, United Kingdom.

Background and Aims: Providing regional anaesthesia for patients can have many outcome benefits for patients but requires time and expertise. Traditionally, operating theatres run in a linear manner but, by performing regional anaesthesia between cases, in a different room, consecutive procedures can overlap, thereby processing patients in parallel. Our aim was to move from standard linear processing to parallel processing, using a mobile ‘Block Room’ to improve theatre efficiency and productivity, reduce waiting lists, and improve quality.

Methods: A mobile block room was piloted for Foot and Ankle Orthopaedic surgery at the Freeman Hospital over a 10-month period, covering 5 sessions per week. The Block Room team completed regional and general anaesthesia in anaesthetic rooms of theatres to reduce non-operating time. Data on efficiency indicators, length of procedure, finish times, number of cases performed per day, severe pain in recovery and waiting lists were gathered before and after pilot start.

Results: Average number of cases performed per day increased from 3.6 to 4 during the pilot period. Case mix changed, with more long cases (>120mins) performed on Block Room days compared to non-Block Room days (47.8% vs 29.8%). Late finishes were reduced from 16.7% to 10.2%, and there was a 23.2% reduction in waiting list of over 18 weeks, and 15.7% reduction in number of patients waiting overall since the pilot start.

Conclusions: Parallel processing with a mobile Block Room enhances theatre throughput resulting in an increase in productivity and efficiency, providing additional income whilst reducing expenditure by reducing overruns, outsourcing, and waiting list penalties.

RIB FRACTURE MANAGEMENT: COMPARING 3 DIFFERENT REGIONAL ANAESTHETIC TECHNIQUES

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Abstract: Background and Aims: The analgesia management of rib fractures remains a challenge. In our institution we developed an algorithm to aid in the management. Our final step in this algorithm is the application of a regional anaesthetic (RA) technique, with the choice: Thoracic epidural (TE), paravertebral block (PVB) or a serratus anterior block

Methods: Over a 6 months period we analysed the RA techniques in patients with rib fractures. Collecting demographic data; injury severity scores (ISS), type of block, hospital length of stay (LOS); pre and post block (day 1 post block) incentive spirometry (in ml) and worst pre and post block (day 1 post block) pain scores (0–3 nil, mild, moderate, severe).

Results: (mean and range provided)

Conclusions: There was no difference in the outcome indicators (pain/incentive spirometry) between the 3 groups.

All three types of RA provided the patient with good analgesia and improved their respiratory function. PVB has been shown to be equivalent to TE. We can conclude that TE is equivalent to PVD and SAB. As the SAB is the least invasive it could be considered the block of choice in patients with rib fractures. Further prospective data is required to confirm this.
ESRA7-0362

REGIONAL ANAESTHESIA: WHAT DO PATIENTS ACTUALLY THINK AND KNOW?
Lavado J., Gonçalves D., Gonçalves L., Fonseca R., Sendino C., and Valente E.
Centro Hospitalar de Leiria, Anesthesiology, Leiria, Portugal.

Background and Aims: Regional anaesthesia (RA) has several advantages over general anaesthesia (GA) making it increasingly popular among anaesthetists. However, what do patients think and know about it? This study aimed to investigate patients’ beliefs and knowledge about RA.

Methods: Patients over 18 years old, proposed to surgery and sent to an anaesthesia appointment were included. Data was collected using a questionnaire.

Results: 102 patients agreed on participating. Mean age was 53.0±14.2 years, 57.8% were female. 91.2% had been anaesthetized before. 59.8% had already experienced GA, 37.3% neuroaxial anaesthesia (NA) and only 4.9% nerve blocks (NB).

When asked their opinion about anesthesia safety, 67.4% said GA was safe, while 26.3% said it was a risky or very risky procedure. Regarding NA, 55.8% considered it safe, while 26.3% said it was risky or very risky. Similar results were found for NB: 57.1% considered it safe, but 37.7% said it was a risky or very risky procedure.

Patients were also asked rate the probability of 8 events happening on RA procedures on scale from 1 to 5 (Table 1) and asked if they were aware of several benefits of RA (Table 2).

Conclusions: Results show that patients have a tendency to think that GA is safer than RA. Likewise, they are unfamiliar with RA benefits. Numerous patients also believe that some of the undesired events of RA are much more frequent than they actually are. Improving patients’ information about RA may help gaining their confidence on these kind of procedures.

ESRA7-0181

AN ANESTHESIOLOGIST’S ROLE IN THE MANAGEMENT OF A SERIES OF TRAUMATIC PERIPHERAL NERVE INJURIES REFERRED FOR NEUROSURGERY
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Background and Aims: Neurosurgeons often encounter patients with peripheral nerve injuries (PNI). Anesthesiologists performing regional blocks have expertise in ultrasonography (US) of peripheral nerves. We describe how an anesthesiologist’s US evaluation can play a role in the management of traumatic PNI.

Methods: In a series of 10 traumatic PNI referred for neurosurgery, an anesthesiologist with expertise in US-guided regional nerve blocks made a diagnostic US evaluation of the damaged nerves. US was used either as the sole imaging technique (n = 4), or combined with MRI (n = 6).

Results: The anesthesiologist looked for any abnormal appearances of the nerves. In 6 patients, the following were observed: changes in nerve diameter with thickening or swelling, the presence of additional structures, or flattening or compression. Total disruption with discontinuity was found in 1 patient. No abnormalities were observed in 3 patients. The examination was inconclusive in 2 patients due to metal fragments and soft tissue swelling. 4 patients were treated conservatively. In 6 patients who underwent surgery, US by the anesthesiologist was used to locate the exact site and aspect of the deformity. In 1 patient with nerve discontinuity, the distance between the stumps was measured for graft reconstruction.

Conclusions: US evaluation by the anesthesiologist provided useful diagnostic information that helped with therapeutic decision-making (conservative versus surgical) and helped in selecting the appropriate surgical approach. Besides some limiting factors this bedside examination proved to have advantages over MRI. It is an easy, cheap, accessible and effective way of evaluating traumatic PNI.

Table 1

<table>
<thead>
<tr>
<th>Event</th>
<th>Probability (1-2)</th>
<th>Probability (3)</th>
<th>Probability (4-5)</th>
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<tbody>
<tr>
<td>Becoming paraplegic</td>
<td>49.3%</td>
<td>28.0%</td>
<td>21.9%</td>
</tr>
<tr>
<td>Getting an headache</td>
<td>59.3%</td>
<td>25.0%</td>
<td>15.3%</td>
</tr>
<tr>
<td>Vomiting</td>
<td>49.3%</td>
<td>30.6%</td>
<td>14.1%</td>
</tr>
<tr>
<td>Feeling pain during surgery</td>
<td>41.1%</td>
<td>30.6%</td>
<td>23.2%</td>
</tr>
<tr>
<td>Needle puncture or puncture being difficult</td>
<td>44.9%</td>
<td>34.6%</td>
<td>20.3%</td>
</tr>
<tr>
<td>Getting sensitive alteration (i.e. on leg or arm)</td>
<td>39.7%</td>
<td>32.4%</td>
<td>27.9%</td>
</tr>
<tr>
<td>Having back pain after the procedure</td>
<td>39.5%</td>
<td>36.0%</td>
<td>23.9%</td>
</tr>
<tr>
<td>Getting an infection on puncture site</td>
<td>58.9%</td>
<td>30.6%</td>
<td>10.3%</td>
</tr>
</tbody>
</table>

Conclusions: Results show that patients have a tendency to think that GA is safer than RA. Likewise, they are unfamiliar with RA benefits. Numerous patients also believe that some of the undesired events of RA are much more frequent than they actually are. Improving patients’ information about RA may help gaining their confidence on these kind of procedures.

ESRA7-0073

THE EFFECT OF METRICS BASED FEEDBACK ON ACQUISITION OF SONOGRAPHIC SKILLS RELEVANT TO PERFORMANCE OF ULTRASOUND GUIDED AXILLARY BRACHIAL Plexus BLOCK
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Background and Aims: The purpose of this study was to examine the effect of a metrics based feedback vs. non-metrics based feedback on novices learning predefined competencies of acquisition and interpretation of sonographic images relevant to performance of ultrasound guided axillary brachial plexus block.

Methods: Twelve anesthesia trainees were randomized to either metrics based or non-metrics based feedback groups. After a common learning phase, all participants attempted to perform a predefined task of scanning the left axilla of a single volunteer. Following scan completion; participants in each group received a feedback from a different anesthesiologist expert in regional blocks and were allowed deliberate practice for up to one hour. Feedback for those in the metrics based feedback group was based on previously validated metrics (Ahmed et. al. 2016). Participants in this group practiced each metric item until it was performed satisfactorily as assessed by the supervising anesthesiologist. Immediately after feedback, participants in both groups attempted to perform the scan on the same volunteer. Two consultant anesthesiologists independently scored the video recording pre and post feedback scans using the metrics list.

Results: Both groups showed improvement from pre to post feedback scores (Figures 1a & 1b). Compared with participants in the non-metrics based feedback group, those in the metrics based feedback group completed more steps (median [range], 18.8 [17–20] vs. 14.3 [11–18.5], p = 0.009) and committed fewer errors (median [range], 0.5 [0–1.5] vs. 1.5 [1–6], p = 0.041) post feedback.

Conclusions: In this study, novices’ sonographic skills improved significantly when feedback was incorporated with validated metrics.

E-POSTER DISCUSSION SESSION 10: PERIPHERAL NERVE BLOCKS 2

ESRA7-0309

COSTOCLAVICULAR VS PARACORACOID APPROACH TO INFRACLAVICULAR BRACHIAL PLEXUS BLOCK: A RANDOMIZED CONTROLLED TRIAL

Brown B.1, Magsaysay P.2, Yu J.3, Bureau Y.4, and Dhir S.1
1Western University; Anesthesia, London, Canada, 2Medical City Department, Anesthesiology; Pasig, Philippines, 3McMaster University, Anesthesia, Hamilton, Canada, 4Western University; Medical Biophysics, London, Canada.

Background and Aims: A new approach to infraclavicular brachial plexus block has been described where the ultrasound transducer is placed parallel to the clavicle with the needle inserted in-plane into the costoclavicular space [1][2]. At this position, the cords are clustered around the lateral edge of the artery and superficial compared with the paracoracoid approach [3]. These studies concluded a need for further research to evaluate safety and efficacy.

We have undertaken a randomized controlled trial evaluating the feasibility of the costoclavicular technique.

Methods: Following ethics approval, 70 adults undergoing upper limb surgery were randomized to receive a paracoracoid or costoclavicular infraclavicular block. Both groups received 35mL of 0.5% ropivacaine under ultrasound-guidance and nerve stimulation. Primary outcome was block onset time and block success at 30 minutes. Patients were followed up at postoperative days one and seven.

Results: Overall there was no significant difference between block onset time. Block success at 30 minutes was the same between both groups, with one patient in each group requiring conversion to general anesthetic and one patient in the paracoracoid group (vs zero) requiring surgical supplementation of local anesthetic.

Total needle time –paracoracoid: 162 seconds, costoclavicular: 188 seconds (p=0.03)

Complications during the block and postoperative -no difference between the groups

Patient satisfaction scores at day 1 and day 7 postoperative -no difference between the groups

Conclusions: We have found in this non-inferiority study that the novel costoclavicular approach of infraclavicular brachial plexus block resulted in similar block onset time and block success compared with the paracoracoid approach.
There was not a significant difference in pain scores, in time of first request and amount of Tramadol, between the groups. A significant difference was found in the quadriceps muscle strength measurement. There was not a significant difference in the satisfaction score.

Conclusions: With the adductor canal block we achieved good postoperative analgesia, noninferior to femoral nerve block, but at the same time preserved quadriceps muscle strength better than femoral nerve block.

**E-POSTER DISCUSSION SESSION 10: PERIPHERAL NERVE BLOCKS 2**

**ESRA7-0050**

**COMPARISON OF ADDUCTOR CANAL BLOCK WITH FEMORAL NERVE BLOCK IN ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION**

Shirgoska B., University Clinic for Otorhinolaryngology, Medical Faculty, Skopje, FYR Macedonia.

**Background and Aims:** Adequate pain control following anterior cruciate ligament reconstruction, plays an important role in early mobilization of the patient. The aim of this study is to determine whether with the adductor canal block we can achieve postoperative analgesia as good as with the femoral nerve block, while preserving quadriceps muscle strength.

**Methods:** In this controlled, randomized, clinical trial, 80 ASA1 or 2 patients for ligamentoplasty were divided in two groups. Group1 received an ultrasound guided adductor canal block for postoperative analgesia and group2 received femoral nerve block. As a rescue analgesia we used Tramadol 100mg. when the pain according to Visual Analogue Scale was 30 or more. The parameters we measured postoperatively were: pain during rest, time of first request of Tramadol, and the amount requested, mean dynamometer reading during knee extension as a percentage of the baseline measurement preoperatively, side effects and satisfaction score.

**Results:** There was not a significant difference in pain scores, in time of first request and amount of Tramadol, between the groups. A significant difference was found in the quadriceps muscle strength measurement. There was not a significant difference in the satisfaction score.

**Conclusions:** With the adductor canal block we achieved good postoperative analgesia as noninferior to femoral nerve block, but at the same time preserved quadriceps muscle strength better than femoral nerve block.

**E-POSTER DISCUSSION SESSION 10: PERIPHERAL NERVE BLOCKS 2**

**ESRA7-0382**

**TELEMEDICINE SYSTEM FOR REMOTE INSTRUCTION AND TRAINING OF ULTRASOUND GUIDED PERIPHERAL NERVE BLOCK**

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**Background and Aims:** Ultrasound-guided peripheral nerve blocks require obtaining new technical skills. The training in workshops with experts performing may be essential for the acquisition. However the chances for the training may be limited by time, cost and availability of the expert instructor. Telemedicine has been used as new method of remote instruction and training for various medical cares but scarcely applied for ultrasound-guided nerve blocks. In this study, we developed telemedicine system connected with ultrasound video and annotation for the instruction. We investigated whether commonly available internet environment is sufficient to run the system.

**Methods:** We examine synchronouness of the video and the annotation between trainee and trainer sites at different internet line speed from 4 to 16 Mbps. Video conference device (SONY) with ultrasound machine (Edge, Sonosite) was set at a trainee site. The device with tablet for annotation was set at a trainer site. Monitors of both sites were placed in same room contiguously to compare synchronouness of the video and annotation (Fig. 1). Linear probe was used to scan brachial plexus of volunteer.

**Results:** Ultrasound videos at both sites were closely synchronous from 4 to 16 Mbps. Annotation was also displayed on ultrasound video in both monitors with little delay, which appeared to meet practical use of the instruction and training (Fig. 2).

**Conclusions:** We developed telemedicine system with ultrasound machine and annotation using video conference device. This system can be feasible with available internet environment and may be useful for remote instruction and training of ultrasound-guided peripheral nerve blocks.

**E-POSTER DISCUSSION SESSION 10: PERIPHERAL NERVE BLOCKS 2**

**ESRA7-0410**

**COMPARISON OF PARAVERTEBRAL BLOCK PERFORMED BY ANATOMICAL LANDMARK TECHNIQUE (ALT) WITH ULTRASOUND GUIDED (USG) PARAVERTEBRAL BLOCK FOR SURGICAL ANAESTHESIA FOR BREAST SURGERY**

Patnaik R.1, Chhabra A.1, S R.3, Arora M.1, Goswami D.1, Srivastava A.2, Seena V.3, and Dhar A.3 1All India Institute of Medical Sciences, Department Of Anaesthesiology-pain medicine and critical care; New Delhi, India, 2All India Institute of Medical Sciences, Department Of General surgery, New Delhi, India, 3All India Institute of Medical Sciences, Department Of General surgery, New Delhi, India.
Background and Aims: Paravertebral block (PVB) is an established technique for providing analgesia for breast surgery. The primary objective was to compare anatomical landmark to the ultrasound guided PVB to provide surgical anaesthesia. Secondary objectives included comparison of peri-operative analgesia, complications with other techniques.

Methods: This randomized, controlled study included 72 ASA grade I, II females undergoing elective unilateral breast surgery. They were randomized to either ALT group or USG group and had ipsilateral PVB block with the respective technique from T1-T6. In all patients, 5ml of local anesthetic mixture (0.5% ropivacaine, 5 μg/ml adrenaline, 1μg/kg clonidine) was administered at each level. Paravertebral catheter was inserted at T4/T5 level for postoperative analgesia. After confirming loss of sensation to cold and pinprick, patients were taken up for surgery with propofol sedation (20–50μg/kg/min).

Results: More patients in the USG group [34/36 (94.44%)] had a successful block as compared to ALT group [26/36 (72.22%)] (P=0.024). More dermatomes were blocked in the USG group (P=0.0018) with less sparing of upper T2 and T3 dermatomes. (P=0.003, 0.006 respectively). Time to first analgesic requirement was longer in the USG group 502.5 (195–1440) minute [median (range)] than ALT group 377.5 (215–1440) minute. Pain at rest and movement 2, 4 hours post-operatively (Fig 1,2), number of catheter top ups 24 hours postoperatively were lesser in USG group. (P=0.012) Complications were comparable. (Table1)

Conclusions: USG PVB is better than ALT PVB for anaesthesia and perioperative analgesia for breast surgery.

E-PSTER DISCUSSION SESSION 10: PERIPHERAL NERVE BLOCKS 2

ESRA7-0319

MUSCLE STRENGTH TESTING AFTER FASCIA ILIACA COMPARTMENT BLOCK (FICB) USING A HAND-HELD FORCE EVALUATING & TESTING (FET) DYNAMOMETER IN HEALTHY VOLUNTEERS

Persoons B.1, Vermeulen K.1, Leunen I.1, Soetens E.1, Carenis D.2, Desmet M.3, and Van de Velde M.4 1AZ Groeninge, Anesthesiology, Leuven, Belgium. 2AZ Groeninge, Anesthesiology, Leuven, Belgium. 3AZ Groeninge, Anesthesiology, Leuven, Belgium. 4University Hospital Leuven, Anesthesiology, Leuven, Belgium.

Background and Aims: Evaluation of motor block after regional anaesthesia is typically done by detecting the presence or absence of motor weakness. Dynamic muscle strength measurement can be a valuable technique to evaluate the onset regression of a motor block. This study reports the feasibility of using a FET dynamometer (MicroFET2, Procare, Groningen, the Netherlands) in healthy volunteers receiving a supra-inguinal FICB (S-FICB). The microFET2 consists of a microprocessor that transforms power to a digital number using an advanced transducer with 3 independent strains.

Methods: Following EC approval and written informed consent, 10 healthy volunteers received a S-FICB with lidocaine 0.5% 40 mL. Strength tests were performed before (T0) and 1 h (T1) and 2 h (T2) after the FICB. A strict protocol (figure 1) was followed to test the different muscles.

Conclusions: The FET dynamometer can be an objective and dynamic technique to quantify the evolution of muscle strength after regional anaesthesia. Dynamometer testing might be clinical relevant in rehabilitation protocols post-surgery and for the use in research purposes.

ESRA7-0335

FEMORAL NERVE BLOCK UNDER ULTRASOUND GUIDANCE FOR THE TREATMENT OF CHRONIC POST-SURGICAL PAIN AFTER TOTAL KNEE REPLACEMENT SURGERY

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Background and Aims: The chronic postsurgical pain (CPSP) is defined as a persistent pain, at least for 2 months after the intervention and healing with the incidence of 10-34%. Pathogenesis of post-surgical knee pain may be related to mechanical stimuli that activate free nerve endings around the patella-femoral joint with both somatic and neuropathic pain symptoms. The management of CPSP includes regional techniques and analgesics. In this report, we described ultrasound guided femoral nerve block for CPSP after total knee replacement surgery.

Methods: 74 year-old woman underwent total knee replacement surgery 2 months ago. She described throbbing and shooting-like pain at her knee and complained of numbness and tingling radiating below the knee. Physical examination revealed allodynia, hypersensitivity during palpation, flexion disability and oedema with difficulty in walking and standing. Sedimentation rate and C-reactive protein levels were normal. The patient was diagnosed with CPSP. The knee pain was unresponsive to non-steroid anti-inflammatory agents. Ultrasound-guided femoral nerve block was performed with 15 mL 0.2% bupivacaine and 16 mg dexamethasone.

Results: Initial NRS score of 8 decreased to 3, flexion instability and oedema regressed. Medical therapy with pregabalin 150 mg 2xland paracetamol/codeine (300/30) 2x1 was continued due to ongoing neuropathic and nociceptive symptoms during a 3 months follow-up.

Conclusions: Femoral nerve block under ultrasound guidance would be advocated for the treatment of CPSP after total knee replacement surgery.

ESRA7-0298

SPHENOPATLINE GANGLION BLOCK IN TWO CASES WITH POSTDURAL HEADACHE: INITIAL EXPERIENCE

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E-PSTER DISCUSSION SESSION 11: CHRONIC PAIN MANAGEMENT 2

Muscle strength testing

<table>
<thead>
<tr>
<th>Muscle</th>
<th>T0</th>
<th>T1</th>
<th>T2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oburator</td>
<td>280.5</td>
<td>50.4</td>
<td>244.2</td>
</tr>
<tr>
<td>Femoral</td>
<td>368.4</td>
<td>4.7</td>
<td>291.6</td>
</tr>
<tr>
<td>Psoas</td>
<td>405.8</td>
<td>137.5</td>
<td>327.9</td>
</tr>
</tbody>
</table>

Figure 1. Muscle strength testing with MicroFET2.
Background and Aims: Post-dural puncture headache (PDPH) is an important iatrogenic cause of patient morbidity after attempted epidural blocks and after spinal taps. Conservative therapy and epidural blood patch (EBP) are routine treatment options. Use of major occipital nerve block or sphenopalatine ganglion blockade (SPGB) are reported recently. SPGB is indicated in headache, atypical face pain neuralgia and various sympathetic pain states. Our experience in 2 cases where SPGB applied in treatment of PDPH presented here.

Methods: Case 1: Eighteen-year-old male patient admitted to with PDPH. Patient’s VAS was 8 before SPGB. Bilateral SPGB with a cotton-tipped applicator saturated with 10% lidocaine (2 ml) for 10 minutes under standard ASA monitoring and anesthesiologist attending.

Results: Case 1 reported his VAS as 3 15 min after the SPGB and did not request further pain treatment in the following days. After SPGB in Case 2 VAS ceased 50% and 2 hours later pain started again at the same severity as before the block. SPGB failure diagnosed and epidural blood patch performed for treatment. No further treatment was required.

Conclusions: There is no strict consensus on the treatment of PDPH and EBP is considered as another invasive procedure which adds some more risks to patients. In cases where conservative therapy and EBP is unsuccessful SPGB is being performed sporadically in the literature recently. There is no controlled randomized trial defined for this treatment yet. Studies proving the efficacy of noninvasive SPGB block are necessitated.

E-POSTER DISCUSSION SESSION 11: CHRONIC PAIN MANAGEMENT 2

ESRA7-0280
SUPRASCAPULAR NERVE RADIOFREQUENCY ABLATION FOR CHRONIC SHOULDER PAIN: OUR EXPERIENCE IN SHEFFIELD TEACHING HOSPITAL.

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Background and Aims: Shoulder pain commonly affects elderly population and has a significant impact on quality of life. Patients presenting with shoulder dysfunction have often exhausted all conservative management options and are not suitable for surgical treatment. Suprascapular nerve is responsible for 70% of the afferent nociceptive intervention of the shoulder joint. Nerve block or radiofrequency treatment seem to be the only interventional option left to improve pain and function. Results were assessed by using the Shoulder Pain and Disability Index which is a validated tool used in clinical practice.

Methods: 51 patients were included in the study who had suprascapular nerve radiofrequency between 2011 and 2015. All conservative therapeutic options were exhausted. They were asked to complete SPADI questionnaire prior to procedure, at 3, 6 and 12 months following intervention. We received 34 complete follow up data sets and these patients were included in further analysis.

Results: Data collection based on 34 patients. Pain, function and total score were assessed using SPADI questionnaire. Mann-Whitney test was used for data analysis. There has been statistical and clinical difference in reported pain, function and total score.

<table>
<thead>
<tr>
<th>SPADI</th>
<th>PAIN %</th>
<th>FUNCTION %</th>
<th>TOTAL %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre procedure</td>
<td>79</td>
<td>77</td>
<td>76</td>
</tr>
<tr>
<td>6 months</td>
<td>62</td>
<td>60</td>
<td>61</td>
</tr>
<tr>
<td>12 months</td>
<td>61</td>
<td>62</td>
<td>63</td>
</tr>
</tbody>
</table>

Conclusions: Radiofrequency of the suprascapular nerve should be considered as an alternative treatment option for patients with chronic shoulder pain. Clinical improvement supported with statistical difference should prompt prompt physician to offer that treatment to suitable patients. Our experience demonstrated improvement of pain and function.

ESRA7-0163
A STUDY ON THE CORRELATION BETWEEN OROFACIAL PAIN AND SLEEP DURATION

Lee H., and Kim S.T. Yonsei University College of Dentistry, Department of Orofacial Pain and Oral Medicine, Seoul, Republic of Korea.

Background and Aims: Sleep disorder can aggravate mental stress that causes orofacial pain. In particular, this paper focuses on the sleep duration to examine the relationship between mental health and orofacial pain. This paper suggests that accurate and simple mental examinations and sleep duration test should be carried out for the patients with orofacial pain.

Methods: In this paper, we examined 3,279 patients with Temporomandibular Disorders (TMD), who visited the Orofacial Pain Clinic at Yonsei University College of Dentistry during. We conducted a survey using the Pittsburgh Sleep Quality Index (PSQI) questionnaire. For statistical analysis, we calculate the correlations between orofacial pain, measured by Numeric Rating Scale (NRS), and various factors such as gender, age, taking medicine, total sleep duration, time to fall asleep, and how many times wake up. We also perform independent-sample t-test and regression analysis using SPSS program.

Results: The regression analysis and Pearson’s correlation coefficient show that:
1. As age increases, the pain tends to be more severe (P < 0.05).
2. The longer it take to fall asleep, the more severe pain patients have (P < 0.05).
3. Orofacial pain is not statistically associated with gender, medication use, total sleep duration, and how many times wake up.

Conclusions: The increased mental stress caused by sleep disorder could decrease pain threshold and exacerbate the quality of sleep again. Therefore, learning about the quality of sleep through a questionnaire will be useful for more accurate diagnosis and treatment of TMD. In addition, using a sleep-screening device will be also essential in diagnosing sleep-related breathing disorder in a dental clinic.

E-POSTER DISCUSSION SESSION 11: CHRONIC PAIN MANAGEMENT 2

ESRA7-0146
CHRONIC PAIN PATIENT OUTCOMES USING A NEUROMODULATION SYSTEM WITH AVAILABLE MULTIPLE WAVEFORM PROGRAMMING IN AUSTRALIA


Background and Aims: Treatment of chronic pain is inherently challenging given the subjective nature of pain and array of neuropathic pain states that can uniquely manifest within each patient. The ever-growing availability of neuromodulation systems offering different neurostimulation modalities provides patients with increased capability for customized treatment using various types of approaches, waveforms, and field shapes as well as improved stimulation field targeting technology. In this real-world case series examination, patients using such a neurostimulation system with highly adjustable programming options are evaluated.

Methods: This is an observational case series of patients implanted with a neurostimulation system with available multiple waveform and/or fields shape programming as well as a 3D Neural Targeting algorithm (Boston Scientific). The following different modes of programming are available using this device: 1 kHz, variations of burst programs, anode intensification, standard rate stimulation, and 3D neural targeting algorithm.

Results: To date, collected data from 22 implanted patients (Peripheral Nerve or Dorsal Column) demonstrate an overall mean NRS pain score of 7.9. At 3 (N = 12), 6 (N = 9), and 12 (N = 8) months post-implant, the overall mean NRS pain

TABLE 1: Mean % SPADI results.

CONCLUSION: Radiofrequency of the supraspinatus nerve should be considered as an alternative treatment option for patients with chronic shoulder pain. Clinical improvement supported with statistical difference should prompt prompt physician to offer that treatment to suitable patients. Our experience demonstrated improvement of pain and function.
scores were observed, so far, to be 1.7, 2.6, and 2.4, respectively. Responder rate (>50% pain reduction) out to 12 months post-implant was determined to be 88%.

**Conclusions:** In this preliminary analysis, it was observed that a neuromodulation system capable of providing multiple waveforms and/or field shapes can provide significant overall long-term pain relief. Future studies are needed however to understand the full impact of highly adjustable systems capable of personalized treatment selection.

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**E-POSTER DISCUSSION SESSION 11: CHRONIC PAIN MANAGEMENT 2**

**ESRA7-0020**

**NEW OPTIMAL NEEDLE ENTRY ANGLE FOR CERVICAL TRANSFORAMINAL EPIDURAL STEROID INJECTIONS**

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**Background and Aims:** We aimed in this study to find a safer optimal needle entry angle for cervical transforaminal epidural injection to decrease the chance of an accidental vertebral artery (VA) puncture even with a proper needle entry angle and to visualize the target of the needle tip.

**Methods:** This retrospective study included 312 patients with neck pain or cervical radiculopathy who had undergone MRI scans for diagnosis and treatment. The first line was drawn from the midpoint of the two articular pillars and passed through the midline of the spinous process. The second line was drawn parallel to the ventral lamina line (CTAL). The third line was drawn parallel to the ventral marginal plane at the midpoints of the superior articular processes. The distance of CTAL and NTAL from VA were measured from both sides at C5-6, C6-7, and C7-T1 levels. The distance of CTAL and NTAL from VA were measured from both sides at each level. We examined whether the CTAL and NTAL would penetrate the ipsilateral VA, internal carotid artery (ICA), and internal jugular vein (IJV).

**Results:** There were significant differences between CTAL and NTAL angles at all levels (P < 0.001). There were significant differences between the distance of CTAL and NTAL from VA at all levels (P < 0.001). There were also significant differences between the observed frequency of CTAL and NTAL that would penetrate the major ipsilateral vessels (VA, ICA, and IJV) on all levels and sides (P < 0.001 ~ 0.030).

**Conclusions:** The angle of NTAL (approximately 70°) is safer than the angle of CTAL (approximately 50°) when considering vascular injuries to vessels, such as the VA, ICA, and IJV.

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**E-POSTER DISCUSSION SESSION 12: CHRONIC PAIN MANAGEMENT 3**

**ESRA7-0349**

**PATIENT RESPONSES TO PARESTHESIA-BASED SPINAL CORD STIMULATION (SCS) AND KILOHERTZ FREQUENCY SCS**

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**Background and Aims:** PROCO (Evaluation of Stimulation Pulse Rate on Clinical Outcomes in Patients Whose Pain Is Controlled by Kilohertz SCS) was a double-blind, randomized, crossover study that investigated effects of stimulation frequency on analgesia. We also characterized patient responses to paresthesia-based (PB) SCS and kHz SCS.

**Methods:** Thirteen patients with chronic pain underwent a 30-week PB SCS trial and an 8–10 week search during which they tested up to 14 stimulation locations (7 mm bipoles, 30 μs pulse width) to identify the best location (“sweet spot”) of stimulation at 10 kHz.

**Results:** Figure 1 shows categorization of patient responses to kHz SCS. “Both PB and kHz” indicates the patients who responded to both PB SCS and kHz SCS, “PB only” indicates the patients who responded only during the PB SCS trial (n=2), “kHz only” indicates the patients who responded only during the kHz SCS trial (n=2), and “Neither PB nor kHz” indicates the patients who responded to neither (n=7). “PB only” indicates the patients who responded only during the kHz SCS trial (n=2). “kHz only” indicates the patients who responded only during the sweet spot search (n=3). The insert shows the patient global impression of change for patients in the “Neither PB nor kHz” group after they were withdrawn from the study.

**Conclusion:** In this preliminary analysis, it was observed that a neuromodulation system capable of providing multiple waveforms and/or field shapes can provide significant overall long-term pain relief. Future studies are needed however to understand the full impact of highly adjustable systems capable of personalized treatment selection.
the PB trial (<1 week to optimize) and the kHz sweet spot search (8–10 weeks to optimize), potentially biasing response in favor of 10 kHz.

E-POSTER DISCUSSION SESSION 12: CHRONIC PAIN MANAGEMENT 3
ESRA7-0356
SPATIAL SENSITIVITY OF KILOHERTZ FREQUENCY SPINAL CORD STIMULATION (SCS)
Thomson S.1, Tavakkoli Zadeh M.2, Love-Jones S.3, Patel N.4, Gu J.W.2, Doan Q.2, and Moffitt M.2 1Basildon and Thurrock University Hospitals, Anaesthetics, Basildon, United Kingdom, 2University College London Hospitals, Anaesthetics, London, UK, 3Southmead Hospital, Anaesthetics, Bristol, United Kingdom, 4Southmead Hospital, Neurosurgery, Bristol, United Kingdom. 2Boston Scientific Research & Development, Valencia, USA.

Background and Aims: PROCO (Evolution of Stimulation Pulse Rate on Clinical Outcomes in Patients Whose Pain Is Controlled by Kilohertz SCS) was a double-blind, randomized, crossover study that investigated the effects of stimulation frequency on analgesia. Data collected could be used to gain insights into spatial sensitivity of kHz SCS.

Methods: 31 patients (27 FBSS, 4 chronic radiculopathy; low back pain ≥ 2 leg pain) were implanted with spinal cord stimulators and underwent an 8–10 week search during which they tested ≤ 14 stimulation locations (7 mm bipoles, 30 μs pulse width) to identify the best location (“sweet spot”) of stimulation at 10 kHz. The search started with bipoles in the T9-T10 interspace, and expanded rostrally and caudally from the T9-T10 interspace within lead placement and protocol constraints. 21 patients achieved ≥ 50% low back pain relief (responders).

Results: Within the responders, bipoles providing maximum pain relief were identified across almost the entire rostrocaudal extent searched (T8 to T11). Rostrocaudal distributions of bipoles providing maximum pain relief as a percentage of total bipoles tested in the responders are shown in Figure 1.

Conclusions: Because the extent of the sweet spot search was limited, it remains an open question whether the T9-T10 vertebral region is the optimal target for kHz SCS. Stimulation in this study was optimized for 10 kHz SCS. A logical extension is to compare spatial concordance of this therapy mode and paresthesia-based targeting to identify optimal lead placements that allow patients to benefit from multimodal treatments.

E-POSTER DISCUSSION SESSION 12: CHRONIC PAIN MANAGEMENT 3
ESRA7-0141
SPINAL CORD STIMULATION (SCS) TRIAL OUTCOMES AFTER CONVERSION TO A MULTIPLE WAVEFORM SCS SYSTEM
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Background and Aims: Enabling patients to experience multiple stimulation frequencies and waveforms using a single spinal cord stimulation device (SCS) within a trial offers potential for more definitive identification of neurostimulative approaches optimally suited to the individual. Here, we report outcomes of a cohort of patients who, after enduring a trial failure using a system design that hold stimulation constant at 10 kHz only, were switched to a system capable of multiple stimulation waveforms.

Methods: Patients who failed an SCS trial at 10 kHz (Senza, Nevro Corp.) were evaluated after interchanging to a trial stimulator providing standard rate stimulation, anatomically-guided 3D neural targeting, and available programming capabilities using multiple stimulation waveforms (Multiple Waveform SCS) such as 1 kHz, burst, and anode intensification (Precision Spectra, Boston Scientific). Percent pain relief (PPR) as calculated using baseline and post-trial pain scores is reported following trials using both systems.

Results: In 14 patients who failed an SCS trial using 10 kHz and had NRS or Percent Pain Relief (PPR) scores available, 50% (n = 7) reported ≥50% improvement in pain relief as measured by Percent Pain Relief using a Multiple Waveform SCS System. Of all 20 total patients in this cohort so far, 65% (n = 13) preferred SCS preferred Multiple Waveform SCS.

Conclusions: A system capable of robust optimization that conforms to the individual is uniquely equipped to respond to inter-patient variation and intra-patient pain experience changes over time. These preliminary data demonstrate that a multiple waveform SCS system can salvage failed 10 kHz trials. Further study is needed.

E-POSTER DISCUSSION SESSION 12: CHRONIC PAIN MANAGEMENT 3
ESRA7-0143
IMPROVED SPINAL CORD STIMULATION OUTCOMES ASSOCIATED WITH PERCUTANEOUS LEAD PLACEMENT AND MULTIPLE WAVEFORM PROGRAMMING TECHNIQUE
Pyles S.1, Lechleiter K.2, Huynh D.2, and Jain R.2 1Pain Treatment Centers, Pain Management, Ocala, USA, 2Boston Scientific Corporation, Clinical Research, Valencia, USA.

Background and Aims: Low back pain/paresthesia concordance likely occurs when stimulating electrodes are placed at T6-T7 versus T8-T12; however, the abdomen is uncomfortably stimulated at T6-T7. Advances in spinal cord stimulation (SCS) systems allow for different waveforms/modes of neurostimulation including precise stimulation field 3D-neural targeting (3DNT). As such, we examined 40 patients with chronic, discogenic pain using a very specific treatment approach.

Methods: Consecutively enrolled patients underwent SCS trial and subsequent implant using a commercially-approved, Multiple Waveform SCS system (Precision Spectra, Boston Scientific) with distal leads placed midline at top of T7. For first 72-hours of trial, patients were seen daily for programming: first 24-hours, a 3DNT program with maximized pain/paresthesia overlap at standard rates (f=30-60Hz, pw=210-250μs) and in second 24-hours, a simplified paresthesia-based 3DNT program were given, typically using a guarded cathode configuration (2–4 cathodes). Once coverage was achieved, rate was increased

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to ≥1kHz, pulse width decreased to 130μs, and amplitude set to level below pa-
tient's perception threshold. During final 24-hours of trial, the preferred stan-
dard or high rate (≥1kHz) waveform was used.

Results: At a mean last follow-up duration of 197.9 days, mean reduction in NRS=5.3 (p<0.001) observed in 40 patients (baseline=8.0, follow-up=2.7).

Twenty-percent (8/40) of patients reported NRS=0 and 50% (20/40) of patients reported NRS≥2.0 at last follow-up. Additional patients, patient-reported wave-
form preferences and changes in NRS score by waveform usage and preference to be reported.

Conclusions: This study supports the postulate that a Multiple Waveform SCS system combined with proper patient selection and SCS trial optimization can deliver significant outcome improvement.

E-POSTER DISCUSSION SESSION 12: CHRONIC PAIN MANAGEMENT 3

ESRA7-0182

SURGICAL TECHNIQUE AND CLINICAL OUTCOME FOR TARGETED DORSAL NERVE ROOT NEUROSTIMULATION FOR USE IN THE TREATMENT OF CHRONIC FOOT AND/OR ANKLE PAIN

Pyles S.1, Leechleiter K.2, Huynh D.3, and Jain R.2 1Pain Treatment Centers, Pain Medicine, Ocala, USA, 2Boston Scientific Corporation, Clinical Research, Valencia, USA.

Background and Aims: Stimulation near the Dorsal Root Ganglion (DRG) is thought to achieve chronic focal pain relief (including foot and groin) in some patients. However, due to the high rate of reported DRG implantation procedure-related adverse events, consideration of other neuromodulation ap-
proaches remains clinically pertinent. In this study, we evaluate clinical outcomes of a surgical implantation technique as an alternative method of targeted dorsal nerve root stimulation to treat chronic foot and/or ankle pain.

Methods: This consecutive case series evaluation consists of patients with chronic foot and/or ankle pain related to diagnosis of CRPS or peripheral neu-
ropathy evaluated at a single center. All patients were permanently implanted with a neurostimulator capable of anatomically-guided (3D) neural targeting (Precision Spectra, Boston Scientific). Leads were placed antegrade through the sacral hiatus from L5 - S1.

Results: Preliminary data suggests that an 85%/+14.9) improvement in pa-
tients' foot pain post implant was noted in this small cohort of 10 patients. Ad-
ditional analysis to be presented in this report.

Conclusions: While neurostimulation near the DRG is a noteworthy develop-
ment, questions remain whether this approach will be widely used given the complexity and accompanying risks of the procedure. Advancements in con-
ventional neurostimulation technology and implantation technique may in fact be capable of producing comparable results without the associated risk for ad-
verse events such as lead fracture. We propose that leads placed antegrade through the sacral hiatus within a range of L5 - S1 may achieve comparable outcomes to stimulation near the DRG for focalized pain of foot and/or ankle.

E-POSTER DISCUSSION SESSION 12: CHRONIC PAIN MANAGEMENT 3

ESRA7-0387

KNOWLEDGE TRANSLATION: AN INTERPROFESSIONAL APPROACH TO INTEGRATING A PAIN CONSULT TEAM WITHIN AN ACUTE CARE UNIT

Senderovich H. University of Toronto/Baycrest Health Sciences, Family and Community Medicine, Toronto, Canada.

Background and Aims: Management of pain in elderly patients presents many difficulties in both assessment and treatment. An interdisciplinary ap-
proach is required to assess and treat pain, and to improve the quality of care.

The goal of a pain management team is to improve confidence and instill com-
proached partnerships.

Methods: Three physicians with specific knowledge and training dealing with pain integrated themselves as part of the Acute Care Unit team with the goal of disseminating their expertise on the unit. A pre and post survey was adminis-
tered to staff to better understand how this initiative impacted changes in knowl-
edge and practice.

Results: Pre-tests indicated high confidence levels in treating and assessing pain among some staff on the unit. Post-test interviews showed that overall the staff felt an increase in personal confidence, gaining the knowledge necessary to more effectively assess and treat their patients’ pain.

Over 90% saw an improvement in their comfort with opioids. 40% felt a sig-
nificant change in personal confidence levels. 30% noted and appreciated the educational value of the intervention. 10% felt that pain team did not affect their ability to assess and treat pain.

Conclusions: Self-assessment questionnaires may not adequately reflect knowledge of team and determine learning needs of a team. Integrating within the unit rather than approaching as an external consulting authority created relationships that support successful knowledge translation.

Using this method, it was possible to begin establishing the Acute Care Unit as an independent center of pain management.

E-POSTER DISCUSSION SESSION 13 - MISCELLANEOUS 2

ESRA7-0160

ULTRASOUND GUIDED CENTRAL VENOUS VASCULAR ACCESS – NOVEL NEEDLE NAVIGATION TECHNOLOGY COMPARED WITH CONVENTIONAL METHOD

Beh Z.Y.,1, Chew S.C.2, Hasan M.S.2, and Chinnia K.1 1Changi General Hospi-
tal, Anaesthesia & Surgical Intensive Care, Singapore, Singapore, 2University of Malaya, Department of Anaesthesia- Faculty of Medicine, Kuala Lumpur, Malaysia.

Background and Aims: Central venous catheter (CVC) insertion is a very common procedure in the intensive care setting. A recent international guideline advocated the use of ultrasound for routine internal jugular central venous cath-
er insertion. The needle navigation technology is a new innovation, a.k.a guided positioning system (GPS) which allows clinician to visualize the needle position and trajectory in real time as it approaches the target. We hypothesised that the use of GPS would increase success rates and decrease performance times of vascular access procedures.

We aimed to compare the success, efficacy and safety of the procedure using ultrasound guidance (UG) with conventional versus GPS method.

Methods: This was a prospective RCT in a single centre ICU. 100 patients were randomized into two groups (50 each group). Subjects would receive CVC inser-
tion via IV using UG out of plane approach by conventional versus GPS method. Outcomes measured were the procedure efficacy, safety, level of oper-
ators’ experience and satisfaction.

Results: All patients had successful cannulation with 1st attempt except for 1 case required 2nd attempt (conventional group). The median performance time for GPS method was longer (25.5 seconds versus 15.0 seconds; p = 0.01). 86% of the operators had >3 years in anaesthesia 1 haemotoma occurred in conventional group. Only 88% of the operators using GPS method were satisfied (versus 100% conventional).

Conclusions: UG/CVC insertion via IV is a safe procedure, be it using con-
ventional or GPS. GPS did not confer benefit but associated with slower perform-
ance time and lower satisfaction level among the experienced operators.

E-POSTER DISCUSSION SESSION 13 - MISCELLANEOUS 2

ESRA7-0461

CHRONIC PAIN ULTRASOUND GUIDED QUADRATUS LUMBOUM BLOCK WITH PARAMEDIAN SAGITTAL OBLIQUE (SUBCOSTAL) APPROACH

Branco Reis V.H.1, Vieira M.S.R.M.1, and Durán J.2 1Centro Hospitalar Trás-os-Montes e Alto Douro, Serviço de Anestesiologia e Temporãea da Dor, Vila Real, Portugal, 2Hospital Garcia de Orta, Unidade Dor, Almada, Portugal.
Background and Aims: Failed back surgery syndrome is a problem in chronic pain care with persistent back pain difficult to treat. Interventive approaches are useful for diagnosing and analgesia in these patients.

We present a case of persistent severe chronic back pain management, in an ambulatory patient, with a Quadratus Lumborum Block (QLB) using the subcostal approach, aiming the treatment of both dorsal and lumbar pain with one single puncture.

Methods: 44-year-old overweight woman, with severe chronic back pain for several years, laminectomy (L5) in 2010 and arthrodeses in 2011, without any improvement. Since last year the pain as worsened (VAS score 6, peak 10), in our observation reveal a diagnostic suspicion of myofascial dorsal and lumbar pain, especially in the right side.

Results: The procedure progressed uneventfully. The patient reported immediate total relief and great satisfaction.

Conclusions: It appears that the local anaesthetic can spread cranially under the lateral arcuate ligament to the endothoracic fascia, and reach the lower thoracic paravertebral space posterior to the endothoracic fascia, providing lumbar and thoracic analgesia in an effective and immediate fashion.

E-PAPER DISCUSSION SESSION 13 - MISCELLANEOUS 2
ESRA7-0191
QUADRATUS LUMBORUM BLOCK IN ERAS PROTOCOL FOR COLORECTAL SURGERY: AN OBSERVATIONAL RETROSPECTIVE STUDY
Costa F.1, Susia C.1, Pascarella G.1, Del Buono R.1, Mascianà G.2, and Agrò F.E.1 1Campus Bio-Medico University, Anaesthesia and Intensive Care, Roma, Italy, 2Campus Bio-Medico University, General Surgery, Roma, Italy.

Background and Aims: Quadratus lumborum block type 2 (QLB2) has proved to be an effective block in abdominal surgery, because it provides analgesia from T8 to L1 dermatomes. In several studies, it seems to provide a better analgesia than TAP block. ERAS protocol for colorectal surgery considers three targets: shorter recovery time, less intraoperative and postoperative opioids administration. We present the results of an observational retrospective study, regarding the application of QLB 2 in the contest of ERAS protocol on laparoscopic colorectal surgery, as an alternative to other locoregional techniques.

Methods: We enrolled 20 patients who underwent laparoscopic colorectal surgery and signed informed consent. After the induction of general anesthesia, each patient was given a bilateral QLB 2, injecting 20 mL of Ropivacaine 0.375% + Dexamethasone 2 mg for each side. (Fig. 1). Postoperative outcomes were analysed.

Results: Pain in postoperative period was well controlled and only 10% of patients needed morphine administration. Nasogastric tube was early removed in all patients, in the first postoperative day, so gastrointestinal canalization and spontaneous alimentation were rapid to obtain. Furthermore, recovery of deambulation was rapid and the average hospitalization length was 3.9 days (Table. 1).

Conclusions: The use of QLB2 in laparoscopic colorectal surgery is a valid method to be included in the ERAS protocol, as related to an early nasogastric tube removal, gastrointestinal canalization and spontaneous alimentation were rapid to obtain. Furthermore, recovery of deambulation was rapid and the average hospitalization length was 3.9 days (Table. 1).

<table>
<thead>
<tr>
<th>Postoperative Outcomes</th>
<th>Average Pain (NRS)</th>
<th>Morphine consumption (% of patients)</th>
<th>Nasogastric tube removal (hours)</th>
<th>Recovery of deambulation (hours)</th>
<th>Recovery of spontaneous feeding (hours)</th>
<th>Hospitalization length (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Pain (NRS)</td>
<td>3*</td>
<td>16%</td>
<td>20*</td>
<td>21*</td>
<td>31*</td>
<td>3.9*</td>
</tr>
</tbody>
</table>

*expressed as mean

Conclusions: The use of QLB2 in laparoscopic colorectal surgery is a valid method to be included in the ERAS protocol, as related to an early nasogastric tube removal, gastrointestinal canalization and spontaneous alimentation. Moreover, we observed a substantial reduction of morphine administration and its collateral effect, like gastrointestinal peristalsis reduction.
E-POSTER DISCUSSION SESSION 13 - MISCELLANEOUS 2
ESRA7-0012
SERRATUS-INTERCOSTAL BLOCK IN PREVENTION OF CHRONIC PAIN AFTER BREAST SURGERY
Perrez I., 1 Hospital Clinico Universitario de Valladolid, Anestesiologia y Reanimacion, Valladolid, Spain.
Background and Aims: MAIN: Quantify long-term efficacy and safety of serratus-intercostal block after breast surgery.
SECONDARY: Measurement of pain intensity and complications.
Methods: Retrospective observational study in patients who signed consent. Inclusion criteria: age ≥ 18 years, body mass index < 25, ASA I-III and able to understand a numerical verbal scale (EVN from 0 to 10) to assess pain, breast surgery.
Results: We studied 70 patients: 35 in study group and 35 in control group. Two groups were comparable.
In study group, received general anesthesia and serratus-intercostal block. All blocks were performed in supine awake patient, with Siemens Acuson P300 machine and a 6–15 MHz high frequency linear transducer and Stimuplex® 22G 100 mm (B Braun medical) needle. The transducer was placed in the breast midline and the needle was inserted through the lower edge, to reach position between anterior serratus and intercostal muscles, until we saw anesthetic diffusion. Control group patients received just only general anesthesia. We collected data of age, weight, sex, comorbidity, surgical-anesthetic technique, immediate postoperative period (NVS, additional analgesia and adverse effects) and 3 months later. We used PASW®v17.0 (SPSS, Inc., Chicago, IL, USA) for statistical analysis.
Results: We found 15% in incidence of chronic pain and 10% complications (hematoma, surgical wound infection, seromas, paraesthesia), none due to the anesthetic technique. We found significant lower incidence and intensity of chronic pain in study group.
Conclusions: Serratus-intercostal block is a safely technique in chronic pain prevention after breast surgery.

E-POSTER DISCUSSION SESSION 13 - MISCELLANEOUS 2
ESRA7-0067
TAPENTADOL, AS PART OF A MULTIMODAL PERI-OPERATIVE ANALGESIC PATHWAY, MAY FACILITATE EARLY MOBILISATION AND EARLY DISCHARGE IN PATIENTS UNDERGOING KNEE REPLACEMENT SURGERY
Tyrell J.¹, and Kirtland H.² ¹Yeovil District Hospital, Anaesthetics, Yeovil, United Kingdom. ²Yeovil District Hospital, Acute Pain, Yeovil, United Kingdom.
Background and Aims: Enhanced recovery analgesic pathways have traditionally incorporated oral opiates in combination with paracetamol, non-steroidal anti-inflammatories (NSAIDs), and gabapentinoids. Driven by a perceived unacceptable rate of post-op side effects including dizziness and nausea, we decided to audit the replacement of our existing zomorphp/gabapentin combination with tapentadol. Tapentadol has a dual mode of action incorporating mu-agonism and noradrenaline re-uptake inhibition. Tapentadol is licensed for analgesia in acute post-operative pain.
Methods: Consecutive patients undergoing knee-replacement were studied between May-July 2016 (standard pathway - zomorph (20mg bd 48hrs)/ gabapentin (600mg bd 24hrs)), and August-December 2016 (tapentadol pathway (100mg qds 48hrs)). All other aspects of anestheisia and analgesia were standardised including spinal anaesthesia, high-volume local anaesthetic infiltration and a post-op analgesic pathway incorporating paracetamol +/- NSAID in addition to the ‘study’ drugs. Patient characteristics included: age, sex, pre-operative mobility, and type of operation. Outcome measures were chosen to be objective and easy to record and are outlined below.
Results: Total of 47 patients in the ‘standard’ pathway versus 42 in the tapentadol pathway. Pre-surgery mobility worse in the tapentadol group (55% vs 37% respectivly). Pain recognition is important in managing those pain comprehensively. The authors aimed to describe the profile of acute postoperative pain in Dr Soetomo Hospital Surabaya.

Patient groups

<table>
<thead>
<tr>
<th>Standard Pathway</th>
<th>Tapentadol Pathway</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gabapentin/Zomorph</td>
<td>Tapentadol</td>
</tr>
<tr>
<td>47 patients May – July 2016</td>
<td>42 patients Oct - Dec 2016</td>
</tr>
<tr>
<td>F:M 62:38</td>
<td>F:M 60%:40%</td>
</tr>
<tr>
<td>Aged &gt;71 53%</td>
<td>Aged &gt;71 52%</td>
</tr>
<tr>
<td>Aged &gt;51 45%</td>
<td>Aged &gt;51 43%</td>
</tr>
<tr>
<td>Aged &lt;51 2%</td>
<td>Aged &lt;5 5%</td>
</tr>
<tr>
<td>TKR:UKR 85:15</td>
<td>TKR:UKR 88:12</td>
</tr>
<tr>
<td>Mobile independently 64%</td>
<td>Mobile independently 55%</td>
</tr>
</tbody>
</table>

FIGURE 1.

FIGURE 2.
Tapentadol is both clinically and cost effective as part of LIT provided effective short-term pain relief, which was substantially prominent when more infusions were administered to patients with refractory neuropathic pain. Keywords: complex regional pain syndrome, lidocaine infusion therapy, neuropathic pain, postherpetic neuralgia, intravenous lidocaine administration.

**Results:**

LIDT group at the 3 month follow-up. Differences in (%) change in NRS pain score were especially prominent when more infusions were administered to patients with refractory neuropathic pain. Keywords: complex regional pain syndrome, lidocaine infusion therapy, neuropathic pain, postherpetic neuralgia, intravenous lidocaine administration.

**Conclusions:** Tapentadol was both clinically and cost effective as part of a multimodal post-operative analgesic programme for orthopaedic enhanced recovery.

**References:**


**FIGURE 1.**

Methods: We retrospectively evaluated 14 patients treated with a PRF of the genitofemoral nerve for treatment of intractable orchalgia. Abdullah Sulieman et al. *Anesthesiology, Genk, Belgium.*

**Background and Aims:** Lidocaine infusion therapy (LIT) is an effective treatment for relieving various neuropathic pain. However, sustainable pain relief by repeated LIT remains unclear. Therefore, the objective of this study was to determine whether repeated administration of a low dose of IV lidocaine might result in prolonged pain relief in patients with specific neuropathic pain conditions.

**Methods:** In this prospective, randomized, double-blind, placebo-controlled, and parallel study, efficacy and safety of four consecutive infusions in LIT group (3mg/kg of lidocaine) and Control group (normal saline) administrated for 60 minutes with a one-week interval in patients with postherpetic neuralgia or complex regional pain syndrome type II were evaluated. The primary outcome was difference in (%) change in 11-point numerical rating scale (NRS) pain score from baseline to final infusion between the two groups. Secondary outcomes were pain scores for 4 weeks of follow-up and any complications.

**Results:** Forty-two patients finished our protocol. Reduction in NRS pain score at final infusion was significantly (p < 0.011) greater in the LIT group compared to that in the Control group. However, it was not prolonged at one-month follow-up. Differences in (%) change in NRS pain score were especially prominent in the LIT group at the 3rd and 4th infusions. No serious complication was reported in any patient.

**Conclusions:** LIT provided effective short-term pain relief, which was substantially prominent when more infusions were administered to patients with refractory neuropathic pain. Keywords: complex regional pain syndrome, lidocaine infusion therapy, neuropathic pain, postherpetic neuralgia, intravenous lidocaine administration.

**FIGURE 3.**

**E-PSTER DISCUSSION SESSION 14: CHRONIC PAIN MANAGEMENT 4**

**ESRA7-0275**

**EFFECTIC AND SAFETY OF LIDOCAINE INFUSION TREATMENT FOR NEUROPATHIC PAIN: RANDOMIZED, DOUBLE-BLIND, AND PLACEBO CONTROL**


**Background and Aims:** Lidocaine infusion therapy (LIT) is an effective treatment for relieving various neuropathic pain. However, sustainable pain relief by repeated LIT remains unclear. Therefore, the objective of this study was to determine whether repeated administration of a low dose of IV lidocaine might result in prolonged pain relief in patients with specific neuropathic pain conditions.

**Methods:** In this prospective, randomized, double-blind, placebo-controlled, and parallel study, efficacy and safety of four consecutive infusions in LIT group (3mg/kg of lidocaine) and Control group (normal saline) administrated for 60 minutes with a one-week interval in patients with postherpetic neuralgia or complex regional pain syndrome type II were evaluated. The primary outcome was difference in (%) change in 11-point numerical rating scale (NRS) pain score from baseline to final infusion between the two groups. Secondary outcomes were pain scores for 4 weeks of follow-up and any complications.

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**Conclusions:** LIT provided effective short-term pain relief, which was substantially prominent when more infusions were administered to patients with refractory neuropathic pain. Keywords: complex regional pain syndrome, lidocaine infusion therapy, neuropathic pain, postherpetic neuralgia, intravenous lidocaine administration.

**E-PSTER DISCUSSION SESSION 14: CHRONIC PAIN MANAGEMENT 4**

**ESRA7-0409**

**EFFECT OF OCCIPITAL PULSED RADIOFREQUENCY THERAPY FOR GENITOFEMORAL NEURALGIA**

Dehaene S., Buyse K., Puyhaert M., Van Zundert J., and Mestrum R. ZOL, Anesthesiology, Genk, Belgium.

**Background and Aims:** The innervation of the groin is complex with overlap of the genitofemoral (GFN), the ilioinguinal and the iliohypogastric nerves. The femoral branch of the GFN innervates the skin over the anterior part of the upper thigh. The genital branch innervates the cremaster muscle and the spermatic cord, scrotum in males and the labia majora and mons pubis in females. The aim of this study is to analyze the effect of ultrasound (US) guided PRF of the GFN.

**Methods:** We retrospectively evaluated 14 patients treated with a PRF of the genital branch as described by Terkawi and Romdhane (1). All patients underwent a US guided diagnostic block with 1cc Lido 2%. Only patients with more than 50% pain relief were scheduled for PRF. Paresthesias in the genitofemoral dermal nerve after sensory stimulation at less than 0.50V ensured correct needle position. PRF was performed during 240 seconds at 20ms pulse width and 45V, not exceeding 42°C at the needle tip. Global perceived effect (GPE) was evaluated at short term (6 weeks) and long term (time of telephone based survey).

**Results:** All but one patients (93%) had a positive diagnostic block and an underf PRF treatment. One patient was lost to follow up. 7/12 (58%) had significant effect (GPE >50%) after 6 weeks and 4/12 (33%) had significant effect on long term (7 up to 32 months, mean 15 months).

**Conclusions:** Although the long term effects are still unclear, PRF of the GFN is a promising technique in groin and genital pain.

It is mostly associated with unilateral intermittent shooting pain along with itching, bilateral pain, light and sound sensitivity, slurred speech, difficulty with balance and paraesthesias. The aim of this study was to ascertain which symptoms were most improved with pulsed radiofrequency.

Methods: A total of 18 patients were included in the study over a period of 8 months. They had typical symptoms of occipital neuralgia and had been treated with pharmacological treatment so far. The patients who had pre-existing history of other causes of headache were excluded from the study. Standard neurothermometer was used for pulsed radiofrequency which was done at 42 degrees for two minutes for two intervals. 20G insulated needles with 10mm exposed straight tip were placed for the procedure under ultrasound guidance. The procedure was followed by injection with local anaesthetic and steroids.

Results: 15 out of 18 patients had total relief of pain post procedure. Pulsed radiofrequency increased the duration of analgesia to 12–16 weeks in 10 patients, 8–12 weeks in 6 patients. The other symptoms relieved were pain behind the eye, difficulty with balance, nausea and vomiting and muscle spasms.

Conclusion: 55.5% (n=10) patients had pain relief for more than 3 months which were similar to the findings of Huang et al (2012). There was also relief in muscle spasms as similar to found by Vanelderen et al (2010). Pulsed radiofrequency is effective in reducing troublesome symptoms in occipital neuralgia.

ESRA7-0013

CLINICAL EFFICACY AND PROGNOSTIC FACTORS OF PERCUTANEOUS ENDOSCOPIC LUMBAR ANNULOPLASTY AND NUCLEOPLASTY FOR PATIENTS WITH DISCOGENIC LOW BACK PAIN

Lee J.H.1, and Lee S.H.2,3 Woordul Spine Hospital, Physical Medicine & Rehabilitation, Seoul, Republic of Korea. 2Woordul Spine Hospital, Neurosurgery, Seoul, Republic of Korea.

Background and Aims: Selecting the appropriate treatment for discogenic low back pain (DLBP) is often difficult. Percutaneous endoscopic lumbar annuloplasty and nucleoplasty (PELAN) is a minimally invasive treatment for the decompression of the posterior portion of the nucleus or granulation tissues in the torn annulus. This study aimed to identify the clinical efficacy of PELAN in treating patients with DLBP and to investigate the prognostic clinical or radiological variables.

Methods: Eighty-nine patients who underwent PELAN due to DLBP were included. Numeric rating scale (NRS) for back pain, Oswesty disability index (% ODI%), and the modified MacNab criteria were measured at short-term (3–4 weeks) and long-term (at least 12 months) follow-up to investigate the clinical efficacy of PELAN. Clinical success was defined as at least a 50% reduction in NRS, 40% reduction in ODI(%), and good or excellent response per MacNab criteria. Clinical and radiological variables were compared between successful and unsuccessful outcome groups to determine prognostic variables.

Results: NRS and ODI(%) were significantly reduced at short- and long-term follow-up after PELAN. On long-term follow-up, 68 (76.4%), 68 (76.4%), and 58(65.2%) of patients achieved a successful NRS, ODI(%), and MacNab response. Pain during axial flexion among clinical variables was significantly related to good clinical outcomes and Modic change among radiological variables was significantly related to poor clinical outcomes.

Conclusions: PELAN yielded favorable outcomes in patients with DLBP refractory to conservative treatments. Flexion pain was prognostic of positive outcomes, while Modic change was prognostic of poor outcomes.

ESRA7-0242

EFFECT OF SPINAL CORD STIMULATION ON MICROCIRCULATORY FUNCTION AND PAIN RELIEF IN PATIENTS WITH PERIPHERAL VASCULAR DISEASE


Background and Aims: Since 1976 spinal cord stimulation (SCS) is option for treatment of peripheral vascular disease (PVD), not only for pain relief, but also because of improvement in limb microcirculatory function. The aim of this study is to determine the effect of SCS on limb microcirculatory function in patients with non-reconstructable PVD.

Methods: We conducted a retrospective analysis of 38 consecutive patients with non-reconstructable PVD who underwent SCS between 2012 and 2016. Preoperative and follow-up laser-doppler flowmetry (LDF) were performed in 16 patients. Pain relief was assessed by VAS in all patients.

Results: Our study included patients with IIB (6 patients, 15.8%), III (23 patients, 60.5%) and IV (9 patients, 23.7%) stage by Fontaine classification with mean age of 64.68 (range 39–83). At baseline, the mean (±SD) index of LDF before operation was 2.97±2.671 ml/min100g and on mean follow up of 19.7 months was 7.29±4.76 ml/min100g. Comparing baseline indexes of LDF before and after operation a statistically significant improvement in microcirculatory function (p<0.006) was seen. But only Valsalva functional test have demonstrated significant improvement in postoperative probes (p=0.006).

Conclusions: Spinal cord stimulation is absolutely efficient modality in pain relief for patients with non-reconstructable PVD. But some improvements in microcirculatory function is also evident. Our results prove the enlargement in microcirculatory reserves and improvement in collateral circulation in damaged limb after SCS procedure.

ESRA7-0217

BEE VENOM PATCHES EFFECTIVENESS IN POSTHERPETIC NEURALGIA PAIN MANAGEMENT


Background and Aims: Postherpetic neuralgia could be a very painful and drug resistant condition in certain cases. Bee venom anagelseic properties have been known since ancient era. The goal of this study is the evaluation of bee venom patches application in management of postherpetic neuralgia.

Methods: 38 patients suffering from postherpetic neuralgia who either refused to get treated by conventional methods (e.g. pregabalin) and were receiving pain killers such as paracetamol, NSAIDs or paracetamol plus opioid occasionally, or who were treated for at least three months but with not significant result, agreed to try bee venom patches applied on painful area daily for 6–12 hours. Pain scores were recorded after a week and one and three months following this alternative therapy. Patients with suspected allergy to bee sting were excluded from this clinical trial. All patients were under no other treatment.

Results: After first week treatment 42 patients expressed significant relief (pain scores 1–2), 12 needed extra analgesics, 3 did not show any improvement and 1 discontinued therapy complaining for burning and itching. After one month, 43 patients (p=0.05) did not express pain and did not need rescue analgesics, 12 described pain scores 1–3, with milder characteristics relieved by single paracetamol (once or twice daily), and 2 were in former condition. After 3 months 50 expressed complete pain relief (p<0.01), 6 still needed rescue analgesics, but more rarely (1–3 times/week) and 2 discontinued therapy.

Conclusions: Even though data are still insufficient, bee venom patches might be an alternative for postherpetic neuralgia treatment.

ESRA7-0460

ERECTOR SPINAE PLANE BLOCK FOR RIB FRACTURE ANAESTHESIA IN THE ANTICOAGULATED PATIENT: A CASE REPORT

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Background and Aims: The use of regional anaesthesia is not recommended in the anticoagulated patient due to increased risk of haemorrhage. However, there are occasions where this anaesthetic technique is the treatment of choice. It is important to be able to identify these patients and to be able to carry out the procedure safely.
Background and Aims: We describe a case where the Erector Spinae Plane (ESP) block with catheter was used successfully to provide analgesia to a patient with multiple lateral rib fractures and on anticoagulation therapy. A 50 year old patient with high BMI and a background of recurrent venous thromboembolism requiring lifelong anticoagulation sustained multiple lateral rib fractures (1st, 3rd, 4th and 6th ribs) and pneumothorax. Pain was severe and causing respiratory compromise and patient was close to requiring critical care admission. Analgesia was initially successfully provided by paravertebral catheters. The patient improved clinically until the catheters were accidentally displaced and the patient deteriorated. Unfortunately, before analgesia could be re-established the patient was re-anticoagulated, thereby preventing repeat paravertebral block.

Methods: We performed an ultrasound guided ESP block using a high frequency linear probe and 16G Tuohy needle. The needle was inserted in a cephalad direction to contact the transverse process of T5 vertebra immediately beneath the Erector Spinae muscle. 30ml of 0.25% bupivacaine was injected under vision and a catheter inserted with an infusion of 0.125% bupivacaine commenced at 12ml/hr.

Results: The patient was comfortable after approximately 15 minutes with a pain score of 0-1/10 and remained comfortable for the next few days. Importantly, she had improved respiratory parameters and was able to cooperate with chest physiotherapy. She went on to make a good recovery without the need for critical care.

Conclusions: ESP block with catheter can be an effective and relatively safe option for chest wall analgesia in the patient with disordered coagulation.

E-PAPER DISCUSSION SESSION 15 - CASE REPORTS 2

ESRA7-0075

DYSPEA FOLLOWING CONTINUOUS INTERSCALENE BLOCKS? - DON'T ALWAYS BLAME THE BLOCK!

Lim Y.C., Changi General Hospital, Anaesthesia & Surgical Intensive Care, Singapore, Singapore.

Background and Aims: Phrenic nerve blockade occurs frequently after interscalene blocks hence it is common to attribute post-block dyspnea to paralysis of the hemidiaphragm. This case series aims to highlight the importance of excluding other causes of dyspnea in patients who received continuous interscalene blocks (cISB).

Methods: Consent to report the cases were obtained.

Results: Case 1
57 year old man, previously well, developed dyspnea post-cISB on post-operative day (POD) 2. Diagnosis of pulmonary embolism was confirmed by pulmonary angiography. Doppler ultrasound revealed lower limb vein thrombosis.

Case 2
68 year old woman, previously well, developed dyspnea post-cISB on POD 1. Non-ST Segment Elevation Myocardial Infarction(NSTEMI) was diagnosed on 12-lead electrocardiogram and cardiac enzymes.

Case 3
60 year old man, body mass index (BMI) 35, with Diabetes Mellitus and hypertension, desaturated on POD 2 post-cISB. Chest X-ray showed pneumonia with parapneumonic effusion.

Conclusions: Most patients who can tolerate a 25% reduction in lung function would remain asymptomatic despite paralysis of the hemidiaphragm. The first 2 patients had no risk factors for developing symptomatic phrenic nerve blockade hence there should be a high index of suspicion for other causes of dyspnea. Appropriate investigations performed revealed diagnosis of pulmonary embolism and NSTEMI respectively. The third patient with raised BMI is at risk of developing symptomatic phrenic nerve blockade. However, the chest X-ray performed revealed a pneumonia.

These cases highlight the importance of performing appropriate investigations to exclude other causes of dyspnea in patients who received a cISB, especially in patients without risk factors for developing symptomatic phrenic nerve palsy.
Background and Aims: Endovascular aortic repair (EVAR) requires large-bore vascular access due to the considerable diameters of the endoprothesis and delivery device. Endovascular procedures can be conducted under local anesthetic infiltration with sedation, regional (spinal/epidural) or general anesthesia. We present the case of a 73-year-old patient who underwent an abdominal EVAR with a bilateral quadratus lumborum 2 block (QLB 2) requiring no intraoperative sedation. The patient was an ASA physical status 4, on dual antiplatelet therapy, and with a predicted difficult airway.

Methods: Under written patient consent, an ultrasound guided quadratus lumborum block was performed bilaterally with the patient on supine position using a 100 mm Sono-Tap® needle (Pajunk). 20 mL of 0.375% Ropivacaine was injected on each side. (Fig.1)

Results: The procedure ended successfully in 3 hours without any response to surgical stimulation during the entire operation, from common femoral arteries cannulation to the expansion and fixation of the endo-aortic graft. (Fig. 2) The patient required no analgesic or sedative administration during and post-surgery, sent to recovery room pain-free.

Conclusions: Anesthesiological management of EVAR is complex, as frequently performed on high-risk patients. General Anesthesia increases the rate of hemodynamic and respiratory complication, while spinal/epidural or local anesthesia with sedation are not always possible to carry out. QLB 2 showed to be safe to perform, providing pain relief at the distribution of T6 to L1 dermatomes, and it could be a valid and rescue alternative if other anesthetic techniques are contraindicated.

E-PAPER DISCUSSION SESSION 15 - CASE REPORTS 2

ESRA7-0354

ULTRASOUND- GUIDED PECS-II BLOCK FOR MASTECTOMY IN A PATIENT WITH PREVIOUS LOBECTOMY, CHRONIC OBSTRUCTIVE LUNG DISEASE AND CARDIAC FAILURE

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Background and Aims: The sole use of regional techniques for anaesthetic management is a safe and practical option in difficult patients. However, choice of the intervention and the local anaesthetic dose should also adjusted to according to the characteristics of the patient and the surgery site. Here, we present our experience with ultrasound-guided (US-G) PECS-II blocks for mastectomy in a patient with previous lobectomy, chronic obstructive lung disease (COLD) and cardiac failure (CF).

Methods: 68 years-old, 56 kg female patient with previous left superior lobectomy due to lung cancer, COLD and CF was scheduled for left mastectomy due to breast cancer. The patient had bilateral rales and was under corticosteroid and inhaler beta-mimetic treatment. To avoid possible complications of general anesthesia, we performed US-G PECS-II blocks following midazolam 2mg IV. Following skin disinfection, using linear 15–6 MHz US probe, the needle was introduced to the plane between pectoralis minor and serratus anterior muscles at the level of 3rd and 4th ribs, covering both, with 20 ml of 0.375% bupivacaine and withdrawn back to the plane between the pectoralis major and minor muscles to inject 10 ml of 0.375% bupivacaine while visualizing thoracoacromial artery.

Results: Surgery was started after confirming appropriate anaesthesia at 20th minute and lasted for 2.5 hours. No additional analgesics were needed for intraoperative period and for 8 hours postoperatively.

Conclusions: PECS-II block with local anaesthetic dose adjustment in high-risk patients undergoing mastectomy is a feasible and practical technique for perioperative anaesthetic management.
Abstracts and Highlight Papers of the 36th Annual European Society of Regional Anaesthesia & Pain Therapy (ESRA) Congress 2017: Poster Viewing Abstracts

Case Reports

ESRA7-0374

ALTERNATIVE BLOCKS FOR SHOULDER SURGERY IN A PATIENT WITH BILATERAL VOCAL CORD PARALYSIS


Background and Aims: Shoulder surgery can result in significant postoperative pain. Intercostal brachial plexus block (ISBs) still represent the gold standard approach for analgesia, however, when contraindicated, regional anesthesiologist have to choose alternative nerve blocks, namely axillary (AN) – and suprascapular (SSN) that may provide effective analgesia for minor shoulder surgery.

Methods: The authors present a 33-year-old female scheduled for shoulder arthroscopy. She had bilateral vocal cord paralysis after total thyroidectomy. The anesthesiologist performed a suprascapular and axillary ultrasound guided nerve block with total dose 75 mg of 0.5% ropivacaine.

Results: The surgery was carried out under general anesthesia in the lateral decubitus position, lasted 90 minutes and was uneventfully. In the end of the procedure, the patient was comfortable, able to talk normally and denied dyspnea. She was discharged home the next day, indicating no pain or need for rescue analgesia.

Conclusions: Postoperative pain management represents a relevant field in shoulder surgery and regional analgesia plays here an important role. The ISB has been associated with some potential side effects, such as incidental paralysis of the vagus and laryngeal recurrent nerves. The combination of SSN and AN has been associated with some potential side effects, such as incidental paralysis of the vagus and laryngeal recurrent nerves. The combination of SSN and AN has been associated with some potential side effects, such as incidental paralysis of the vagus and laryngeal recurrent nerves. The combination of SSN and AN has been associated with some potential side effects, such as incidental paralysis of the vagus and laryngeal recurrent nerves.

Case Reports

ESRA7-0209

SPASTIC TETRAPARESIS: WHEN A PATIENT WITH BACLOFEN PUMP BECOMES A "REAL ANESTHETIC PUMP"


Background and Aims: The patient with tetraparesis represents a challenge to the anesthesiologist. Despite the known advantages of regional anesthesia (RA), this anesthetic approach also presents some technical issues. The authors present the case of a tetraparetic patient with a baclofen pump, proposed to a urological procedure under continuous spinal anesthesia using the drug delivery catheter of the baclofen pump.

Methods: Male, 50 years old, purposed to radical cystectomy. Medical history of spastic tetraparesis and neurogenic bladder sequelae to vertebro-medullary trauma 30 years ago, hypertension and diabetes. The patient had an intrathecal baclofen infusion pump with a catheter tip located in the T12-L1 level.

Results: After placement of a radial arterial catheter, the infusion pump catheter access port was used to administer local anesthetic (LA), using a refill kit. CSF was aspirated and 7 mg of 0.5% isobaric bupivacaine was injected, divided into three doses. Afterwards, saline solution was administered to wash out the LA from the catheter. 1h later, more 2 mg of LA was administered. Surgery lasted 150 minutes and was uneventfully. The baclofen pump contents remained monitored by telemetry throughout the procedure, without changes. The patient stay in the ICU for 24h, transferred to his room afterwards, where the intrathecal baclofen infusion was restarted.

Conclusions: Despite complex management of RA in the patient with paresis (ideal dose, level of blockade), spinal block reveals a safe option, avoiding cardiovascular and dysautonomic changes. The authors present an alternative approach to continuous spinal block, not yet described in the literature, using the administration drugs route from the baclofen pump catheter.

FIGURE 1.
Biccirè D.

She was seen in preoperative clinic, was explained about anaesthetic Regional Anesthesia and Pain Medicine 27-year-old female, ASA 1, with left elbow osteoblastoma, 3 cm in diameter. The pain was largely nocturnal (NRS 7) and NSAID-responsive. After monitoring vital parameters and administration of sufentanil 5 γ plus midazolam 2 mg, an infraclavicular EN and ultrasound-guided block was performed using 20 ml of levobupivacaine 0.5%.

Results: The patient maintained spontaneous breathing and remained vigilant and collaborative during surgery. Intra-procedural pain was 0 on NRS scale and postoperative pain after 8 hours was 0 too. In this case report ultrasounds were used both for the ablation and for the anaesthesia. This could be a valuable alternative to conventional treatment of osteoblastoma (overcoming surgical resection under general anaesthesia or radiofrequency ablation, in safety condition and pain free).

Conclusions: The results of MRgFUS ablation for the treatment of osteoblastoma are encouraging. The NORA Guidelines suggest standards to increase patients’ safety but there are no indications about anesthesia management related to surgical procedures. An EN and ultrasound-guided brachial plexus block seemed an appropriate option to ensure intra- and post-operative analgesia, providing a high efficacy-safety binomial. Further studies are needed to validate our procedural proposal.

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FIGURE 2.

FIGURE 3.

PNB is performed by an experienced operator, using ultrasound and colour Doppler to plan safe needle trajectories. Until haemorrhagic complications in the ultrasound era are better quantified clinicians are obliged to follow up patients meticulously, and intervene early in the event of bleeding. Where there is doubt, regular ultrasound is warranted and computerized tomography may be required. Case reports in the literature may be useful for refining existing guidelines but there is a danger of reporting bias. A national audit project or online reporting system would increase our understanding in this area of regional anaesthesia.

Case Reports

ESRA7-0235

ULTRASOUND: FROM A (ANESTHESIA) TO B (OSTEOBLASTOMA TREATMENT): A CASE REPORT

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Background and Aims: Osteoblastoma is a benign tumour accounting for 1% of bone tumours. Pain is the most common symptom. Presently, CT-guided radiofrequency ablation under general anesthesia is the standard treatment. In this case it was performed a magnetic resonance-guided focused ultrasound (MRgFUS) ablation and an EN and ultrasound-guided plexus brachial block to provide procedural pain control, long-lasting analgesia and safety in non-operating room anesthesia (NORA).

Methods: 27-year-old female, ASA 1, with left elbow osteoblastoma, 3 cm in diameter. The pain was largely nocturnal (NRS 7) and NSAID-responsive. After monitoring vital parameters and administration of sufentanil 5 γ plus midazolam 2 mg, an infraclavicular EN and ultrasound-guided block was performed using 20 ml of levobupivacaine 0.5%.

Results: The patient maintained spontaneous breathing and remained vigilant and collaborative during surgery. Intra-procedural pain was 0 on NRS scale and postoperative pain after 8 hours was 0 too. In this case report ultrasounds were used both for the ablation and for the anaesthesia. This could be a valuable alternative to conventional treatment of osteoblastoma (overcoming surgical resection under general anaesthesia or radiofrequency ablation, in safety condition and pain free).

Conclusions: The results of MRgFUS ablation for the treatment of osteoblastoma are encouraging. The NORA Guidelines suggest standards to increase patients’ safety but there are no indications about anesthesia management related to surgical procedures. An EN and ultrasound-guided brachial plexus block seemed an appropriate option to ensure intra- and post-operative analgesia, providing a high efficacy-safety binomial. Further studies are needed to validate our procedural proposal.

Case Reports

ESRA7-0048

SAFE ANAESTHETIC MANAGEMENT OF A PATIENT WITH KLIPPEL FEIL SYNDROME AND MULTIPLE CO-MORBIDITIES, USING A MULTIDISCIPLINARY APPROACH

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Background and Aims: Klippel-Feil syndrome (KFS) is a complex heterogeneous entity that results in cervical vertebral fusion. We report a safe anaesthetic management of a patient with this syndrome and multiple co-morbidities.

Methods: A 55-year-old wheelchair bound woman with comorbidities, like Klippel Feil syndrome with kyphosis and fixed neck deformity, diabetes, High Cholesterol, severe Osteoarthritis, Epilepsy with brain tumor removed in 2009 with right sided hemiplegia, DVT left leg on Warfarin, and panic attacks, was posted for open abdominal hysterectomy. She had extremely small mandible, significant retrognathia and severe limitation of cervical mobility due to cervical vertebral fusion and Kyphosis in lumbar region. She had anaesthetics in the past, with awake fibre-optic intubation.

Results: She was seen in preoperative clinic, was explained about anaesthetic & pain-relief options, reviewed again on the day of surgery in POCU and was explained about safe option of regional anaesthetic (CSE), which needed her co-operation for positioning. Inspite of being anxious and history of panic attacks, after good explanation, agreed to have the procedure under regional technique, with back up measures like fibre optic intubation and Tracheostomy. In recovery, patient had a good working epidural with excellent pain relief.

Conclusions: Avoidance of general anaesthetic and adherence to regional anaesthetic technique, with back up measures like fibre optic intubation and tracheostomy, should be the prudent choice in a patient with difficult airway.

A multidisciplinary team approach with patient’s involvement is essential in safe management of patients with multiple problems.

Case Reports

ESRA7-0016

ULTRASOUND GUIDED ERECTOR SPINAE PLANE BLOCK AS A RESCUE TECHNIQUE FOR RIB FRACTURES PAIN

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Background and Aims: We describe the single injection ultrasound guided erector spinous plane (ESP) block as a rescue technique to treat acute pain associated with traumatic rib fractures in a young male patient admitted to Intensive Care Unit.

Methods: A 35 year old male sustained traumatic left sided rib fractures (III to VII) and left pneumothorax after motor vehicle accident. He was admitted to ICU for respiratory failure, which is improved with a chest tube. Initial pain therapy was managed with Fentanyl and Ketorolac followed with an i.v. continuous infusion with Tramadol and Ketoprofene. Despite this treatment he refers a 8/10 NRS score, his pain prevented deep breath, cough and sleep. A single shot left sided ultrasound ESP block was performed to the rescue for rib fractures pain as previous described by Forero et al. (RAPM 2016;41(5), 621-7). With patient in sitting position a linear transducer was placed in longitudinal orientation 3 cm on the left of T5 spinal process, a 22G needle were introduced below the erector spinous muscle and 20 ml of Ropivacaine 0.5% were administered.

Results: After 20 min pain scores reduced to 1/10 at rest and 3/10 during cough and deep breath. The patient could sleep and thereafter he could start chest physiotherapy. No adverse events occurred.

Conclusions: Despite different regional anaesthetic techniques are available in the treatment of rib fractures pain such as paravertebral block or other interfascial plane block, the ESP block seems to be easy to do, effective and safety, there are no structures at risk of needle injury nearby.

Case Reports

ESRA7-0266

COMBINED SPINAL-EPIDURAL ANESTHESIA IN A PATIENT WITH PARANEOPlastic CEREBELLAR DEGENERATION

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Background and Aims: Paraneoplastic cerebellar degeneration (PCD) is a rare neurologic disorder caused by an abnormal immune response to an underlying malignant tumor, usually gynecologic. Anesthetic considerations in patients with progressive neurological diseases are multiple, but regional anesthesia is frequently avoided. We describe the anesthetic management of a patient with PCD posted for gynecologic surgery.

Methods: 70-year-old female, ASA III (hypertension, obesity, PCD) with a left ovarian tumor was proposed for left adnexectomy, total hysterectomy and bilateral lymphadenectomy. The ovarian cancer was diagnosed during etiologic investigation of cerebellar ataxia that started two months before. She presented with progressive vertigo, nusea, horizontal nystagmus, diplopia, ataxia of the limbs, dysarthria and dysphagia.

We performed a combined spinal-epidural anesthesia (CSE) via median approach at L2-L3 interspace and administered intrathecally levobupivacaine 15mg (3mL) and sufentanil 2.5μg.

Results: The CSE technique was performed uneventfully at first attempt. The catheter was introduced 4,5cm in the epidural space. Epidural levobupivacaine 0,5% and sufentanil 2,5μg were administered during surgery, that lasted 4 hours, to extend duration of anesthesia.

The surgery was uneventful and the patient remained hemodynamically stable. Epidural continuous infusion of levobupivacaine 0,15% and morphine 0,02mg/mL at 6mL/h was administered postoperatively and patient remained painless, without motor block or aggravation of neurologic symptoms.

Conclusions: In patients with PCD, general anesthesia carries the risk for aspiration, unpredictable response to neuromuscular relaxants and ventilatory depression. We successfully performed a CSE blockade to an obese patient with PCD. In these patients, regional anesthesia is a safe alternative to general anesthesia.

Case Reports

ESRA7-0263

THORACIC EPIDURAL COMBINED WITH GENERAL ANESTHESIA FOR MAJOR RETROPERITONEAL SURGERY IN A TYPE 1 NEUROFIBROMATOSIS PATIENT


Background and Aims: Neurofibromatosis type 1 is a dominant autosomal disease characterized by cutaneous and nervous tissue tumors. The anesthetic management of these patients requires attention to potential airway, neuraxial and peripheral nerve tumors.

We report a case where a combined epidural-general anesthesia was a successful choice in the anesthetic management of a neurofibromatosis patient.

Methods: 21-year-old male, ASA III (neurofibromatosis, dilated cardiomyopathy and left nephrectomy) was proposed for resection of a large retroperitoneal neurofibrom comressing the right urether. The CT scan showed a mass closely related to the right iliac vessels, several masses in the lumbosacral region, marked scoliois and absence of the left iliac bone (Figures 1 and 2).

We performed a combined epidural-general anesthesia. After induction of general anesthesia, the patient was positioned in right lateral decubitus and the thoracic epidural was performed via median approach at T8-T9 interspace.

Results: The epidural technique was performed uneventfully at first attempt. The catheter was introduced 3,5cm below the thoracic epidural space. Epidural ropivacaine 0,375% was administered during surgery to spare opioid usage. The patient remained hemodynamically stable during the uneventful surgery, that lasted 4,5 hours, although complete mass resection wasn’t possible. Postoperatively, he remained pain-free and without motor block or neurologic adverse effects with a continuous epidural perfusion of ropivacaine 0,15% and morphine 5mg.

Conclusions: Although placing thoracic epidural catheters in neurofibromatosis patients is an anesthetic challenge, it can be performed safely if neuroaxial neurofibromas are excluded. Therefore, regional techniques may be considered as pain management strategies for these patients in the perioperative period.
CAN CLONUS PERSIST AFTER ADEQUATE SPINAL ANAESTHESIA FOR KNEE ARTHROPLASTY?

Coskunfirat N., and Bigat Z. 

Background and Aims: Ankle clonus is a rhythmic contraction and relaxing of the muscles, brought out by quickly flexing the foot toward the head. It is a classic symptom of a permanent lesion in brain or descending motor neurons. Here we wanted to present that clonus may persist with adequate spinal anesthesia for knee surgery.

Methods: 68-year-old woman, admitted for right knee-arthroplasty. She had laminectomy at T10-12 levels and she had clonus at both sides. Spinal anesthesia in right lateral position was performed at L3-4 interspace with 2.5 ml of 5% hyperbaric bupivacaine. She was turned supine after epidural catheter from the same level. The level of analgesia to pin-prick was at T-8. At 120th minute patient had discomfort in her leg and 50 mg plain bupivacaine was administered epidurally.

Results: Clonus was observed when patient's leg at the operation site was elevated for surgical preparation and persisted when the operation began (video is available). Surgery finished at 4h40m; the incision site was still anesthetized and level of pin-prick was at T-8.

Conclusions: Selective inhibition of descending inhibitory pathways by low concentrations of general anesthetic agents raises the excitability of the motor neuron pool and clonus test is used to show the integrity of the spinal cord during emergence from scoliosis surgery. Muscles involved in the clonus can be innervated from spinal segments as high as T-6. There are several reported cases of spinal anesthesia causing clonus but to the best of our knowledge this is the first reported case of ankle clonus that persists during spinal anesthesia.

ULTRASOUND-GUIDED PECS I-II AND PARASTERNAL BLOCK FOR AWAKE BREAST SURGERY IN A HIGH ANAESTHETIC-RISK PATIENT. A CASE REPORT

Fusco P., Degan G., Testa A., Luciani A., Petrucci E., De Paolis V., and Marinangeli F.

Methods: A 68-year-old man, ASA-3, underwent undelayable radical mastectomy and an adequate hemodynamic stability. He was admitted to the surgical ward with uncontrolled sympathetic outflow, hyperkalaemia following use of suxamethonium and myopathy associated with TM, which affects the action of muscle relaxants. Consequently, performing a nerve block for surgical anesthesia, where appropriate, instead of general anesthesia, seems a safe anesthetic choice in these patients.

Results: The patient remained calm throughout the 90 min surgical procedure. An episode of hypertension-bradycardia occurred during placement in the chair-position, managed easily with ephedrine. The postoperative period was uneventful and the patient was discharged five days later.

Conclusions: Our case serves as a reminder of this rare condition and its anesthetic implications. Anaesthetic concerns include autonomic dysreflexia with uncontrolled sympathetic outflow, hyperkalaemia following use of suxamethonium and myopathy associated with TM, which affects the action of muscle relaxants. Consequently, performing a nerve block for surgical anesthesia, where appropriate, instead of general anesthesia, seems a safe anesthetic choice in these patients.
Conclusions: This is the first reported case series of U.S P&P block for awake mastectomy with sentinel node biopsy. Technique included 5mls of 0.25% levobupivacaine injected at each site from T2-4 interspaces. Patient then allowed to lie supine and performed pectoral fascia block 1:2 using 20mls of 2% lignocaine with adrenaline 1:200000 & 30mls of 0.125% levobupivacaine (Dosages are calculated according to age and limited to safe levels). Sensory block levels assessed using ethyl chloride spray, after confirming the block working well, surgeons proceeded with surgery. This improved the quality of life of the patients. Both patients claimed that this technique improved their psychological well being on their video interview and would recommend to anyone having this procedure under U.S P&P block.

Case Reports

ESRA7-0422

SHOULDER JOINT REPLACEMENT UNDER EXTREME LOW VOLUME INTERSCALENE BLOCKADE AND LIGHT SEDATION

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Background and Aims: It has long been recognized that an increased risk exists for respiratory complications in patients with pre-existing pulmonary disease following interscalene block (ISB) because of associated phrenic nerve blockade. However these patients would otherwise benefit the most from peripheral nerve blocks, as general anesthesia and systemic opioids could further compromise ventilation and oxygenation. Diaphragm-sparing alternatives to classical ISB afford adequate postoperative analgesia with low incidence of hemidiaphragmatic paralysis, but have not proved to be as effective in providing adequate surgical anesthesia especially for major surgical procedures. These include ISB with decreased local anesthetic volume and concentration or injection away from the brachial plexus.

Methods: A 78-year-old male patient, smoker, 120 pack-years, with left proximal humeral fracture was scheduled for total shoulder arthroplasty. His medical history included chronic obstructive pulmonary disease receiving long-term oxygen therapy and obstructive sleep apnea using CPAP.

We performed an ultrasound-guided ISB, posterior to C5-C6 roots, with 5ml of ropivacaine 0.5%. Light sedation with midazolam (1mg) and an intravenous ketamine infusion (0.4mg/kg/h) was maintained throughout the 3h procedure.

Results: On the basis of the available laboratory and clinical data, the patient had no evidence of respiratory impairment.

He was discharged to the ward on the same day and discharged home 2 days later.

Conclusions: Performing an ISB with meticulous injection of a low volume of local anesthetic allowed a high-risk pulmonary patient to undergo a major surgical procedure avoiding the drawbacks of both the phrenic nerve blockade and general anesthesia.

Case Reports

ESRA7-0372

ULTRASOUND-GUIDED QUADRATUS LUMBORUM BLOCK; INTRAOPERATIVE AND POSTOPERATIVE ANALGESIC TECHNIQUE FOR OPEN APPENDECTOMY AFTER LAPAROSCOPY ATTEMPT AFTER AN ALLERGIC REACTION TO SUFENTANYL

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Background and Aims: A 22-year old male athlete, ASA 1, without previous medical history or allergies, was scheduled for emergency laparoscopic appendectomy.

We decided to combine general anesthesia with regional anesthesia technique; ultrasound guided quadratus lumborum block (QLB) for postoperative analgesia.

Methods: The patient agreed and signed the informed consent form. He was premedicated with midazolam intravenously. We proceeded with the ultrasound guided QLB. The patient was positioned in left lateral position to obtain the view of quadratus lumborum (qL) and transversus abdominis plane approaches of lateral abdominal muscles. Aseptic technique was used. A curvilinear, low frequency probe was used which was placed first in the mid axillary line then the posterior axillary line for the posterior approach. We first visualized the transversus abdominis muscle, then the internal oblique and external oblique forming the aponeurosis and then qL muscle was visualized. 0.25% levobupivacaine 20 ml was infiltrated in the posterior fascia of the qL muscle.

After induction of general anesthesia with sufentanyl,propofol and rocuronium and insufflating the CO2, the patient developed a rash and hypotension. Antiallergic therapy was administered.Since we performed the QLB, and it was an emergency surgery, the surgeons converted laparoscopy to open appendectomy. No further drugs were given intravenously with sevoflurane maintenance.

Results: The surgery was performed without further analgesia and patient emerged without complications.

Postoperatively he did not require any further analgesia. After 20 hours he started experiencing pain requiring paracetamol.After one week allergy testing was performed ambulatory and showed positive for sufentanil and fentanyl.

Conclusions: The QLB could be effective for intraoperative analgesia as for postoperative analgesia.

Case Reports

ESRA7-0296

PERIPHERAL NERVE BLOCK WITH LEVOBUPIVACAINE IN A PATIENT WITH BRUGADA ECG PATTERN: A NEW CHANCE FOR LOCAL ANAESTHETICS?


Background and Aims: Brugada syndrome (BS) is an uncommon genetic disorder affecting SCN5A channels. Individuals exhibiting Brugada-like ECG patterns carry an enhanced risk for major sudden cardiac death (SCD). Multifactorial origin autonomic tone fluctuations in the perioperative period are known triggers of life-threatening arrhythmic events. Regional anesthesia (RA) techniques have been historically discarded in this population due local anesthetics (LA) direct interference in sodium cardiac channels. This proarrhythmic profile may be paradoxically countered by their beneficial properties regarding sympathetic flow.

Here, we present a possible anesthetic management strategy of a patient diagnosed with type 1 Brugada pattern.

Methods: 66-year old male patient, with previously described asymptomatic type 1 Brugada ECG pattern, scheduled for unilateral inguinal hernia repair. Preoperative investigative assessment showed no further alterations. Standard, invasive pressure and BIS monitoring were applied. An ultrasound-guided in-plane ilioinguinal nerve block was performed with 25mg of 0.25% levobupivacaine. Anesthesia was posteriorly induced with fentanyl (25μg/kg) and propofol (2mg/kg) and maintained with sevoflurane and a supraglottic drive.

Results: Surgery went uneventfully. Remarkably low levels of pain were reported and no perioperative adverse events were documented.

Conclusions: RA in BS remains a matter of debate. Current recommendations state peripheral nerve blocks as anesthetic strategy of choice, over neuraxial blockade. Less cardioselective LA and minimization of administration dose, targeting analgesic purposes, further enhances procedural security.

We hypothesize echo-guided analgesic blocks preferably with levobupivacaine as part of a globally protective bundle, involving close monitoring of hemodynamic parameters and anesthesia depth and avoidance of intubation and preventable autonomic triggers.
Five case studies are presented. Physical examination revealed trig-

We present a gestational diabetic primigravid parturient with

We present two patients undergoing thoracotomy MICS mitral valve

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5 of the five patients who demonstrated trigger points in the mas-

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Results: Five of the five patients who demonstrated trigger points in the mas-

Conclusions: Trigger point injections in the muscles of mastication (masseter

Conclusions:

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Background and Aims: Differential diagnosis of head and facial pain is a

Methods: Five case studies are presented. Physical examination revealed trig-

Results:

Methods:

Background and Aims: The post-cardiothoracic surgery pain management

Methods: We present two patients undergoing thoracotomy MICS mitral valve

Results:

Conclusions:

Conclusions: RLB provides an efficacious safe regional option for these chal-

FIGURE 1.
hammer-like back pain over the right paravertebral L5 and S1 region with no radicular symptoms. Her pain worsened with positional change from sitting to standing and supine to sitting position, although there was no pain at rest. Her severe pain on movement was accompanied by urinary incontinence on several occasions precluding child care.

**Results:** Immediate acute pain team review ruled out a central neuraxial cause with epidural and lumbar spine imaging, which revealed a 38mm symphysis pubis diastasis. A pelvic binder was added following Orthopaedic review which aided physiotherapy and ambulation. Below are the initial, 2 month, and 3 month follow up X-rays of the lumbar spine (Figures 1–3, respectively):

**Conclusions:** Symphysis pubic diastasis is usually conservatively managed, unless separation exceeds 5cm where early surgery may improve functional outcomes. Although symptoms may recur in subsequent pregnancies, it does not preclude vaginal delivery. Early recognition and prompt management aim to reduce parturient morbidity and promote resumption of activity.

**Case Reports**

ESRA7-0190

**CONTINUOUS LOCAL ANAESTHETIC WOUND CATHETER INFILTRATION POST CLAMSHELL THORACOTOMY**


**Background and Aims:** Emergency clamshell thoracotomy for a variety of indications in major trauma is an increasingly commonly performed procedure. Survivors present an analgesic challenge as the gold standard of thoracic epidural is rarely suitable in this patient group. Pain related morbidity is high, potentially delaying discharge from intensive care and from hospital. Local anaesthetic wound infusions via elastomeric pumps have been shown to be a useful adjunct to a multimodal analgesic strategy for many types of surgery, avoiding many of the problems associated with neuraxial blockade and systemic opiates.

**Methods:** We report on the novel and successful use of local anaesthetic infusion via elastomeric pump in a 17-year-old man who underwent emergent clamshell thoracotomy after sustaining a stab wound to the flank.

**Results:** Continuous local anaesthetic infusion via wound catheter has been shown to significantly reduce post-operative patient pain scores and decrease length of hospital stay, whilst sparing opioid use. It is technically simpler and avoids many potentially serious side effects associated with other regional analgesia techniques.

**Conclusions:** This is the first reported case of its application post clamshell thoracotomy for trauma. We believe that this technique could significantly reduce pain-related morbidity and improve the patient experience in those undergoing clamshell thoracotomy following trauma.
A 55-year-old gentleman with diabetes mellitus, hypertension, dyslipidaemia and osteoarthritis, presented for right TKA. He underwent left TKA a year ago under general anaesthesia with single-shot femoral nerve block and reported significant post-operative pain requiring high opioid usage. This surgery was performed under spinal anaesthesia. Post-operatively, he was initiated on multi-modal analgesia regime incorporating a programmed intermittent bolus and patient-controlled regional analgesia (PIB+PCRA) via an adductor canal catheter to achieve motor and opioid-sparing analgesia post-TKA.

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Background and Aims: Severe pain after TKA is common. High-dose opioids may have undesirable side effects while femoral nerve block can cause quadriceps weakness impeding early rehabilitation. We describe the use of a multi-modal analgesia regime incorporating a programmed intermittent bolus and patient-controlled regional analgesia (PIB+PCRA) via an adductor canal catheter to achieve motor and opioid-sparing analgesia post-TKA.

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Results: Follow-up was performed for four days including three days of in-dwelling catheter use. Average pain scores at rest and movement was 4.5 and 7.25 respectively. Lower limb exercises were performed on day one but postural hypotension limited his ambulation. Mobilisation with walking-frame was achieved from day two onwards with good pain relief using PCRA. Average use of rescue oral morphine did not exceed 20mg/day. He reports greater satisfaction with the PIB+PCRA regime compared to IV-PCA opioid which he had previously.

Conclusions: PIB+PCRA via adductor canal catheter, with multi-modal analgesia, can potentially provide excellent analgesia without usage of high-dose opioids. The advantage of a demand bolus enabled additional analgesia without compromising quadriceps strength, thus facilitates early rehabilitation.

Case Reports

ESRA7-0261

POST BURN TRACHEAL STENOSIS AND ELBOW CONTRACTURE – A RESCUE USING COMBINED REGIONAL ANESTHESIA FOR ARM SURGERY AND LEG AUTO GRAFTING

Letica Brnadić R., Dobrić M., Hodalín Vidović R., and Beker T. Clinical Hospital Center “Sestre Milosrdnice” - Clinic of Traumatology, Department of Anesthesiology - Resuscitation and Intensive Medicine, Zagreb, Croatia.

Background and Aims: This clinical report describes an anesthetic approach to a 27 year old man, who was readmitted to the hospital two months after burn injury (cca 50% of the body surface area affected, gr. IIB-III), for a planned surgery of elbow contracture. Preoperative examination, revealed stridor during forced inspire, related to tracheal stenoses.

Methods: The previous attempt of administering general anesthesia went unsuccessfully. Since the proposed surgery on the airway would have postponed the planned surgery in our patient suffering from severe pain and with elbow fixed in an unnatural position (without the possibility of adduction and extension of the left arm), we decided to perform a combined regional anesthesia for the intended procedure. The surgical plan consisted of scar resection and relieving of contracture in left elbow, applying of aqua cell, as well as autografting from the right thigh to the left arm.

Results: The anesthetic plan involved a combination of supraclavicular block for the left arm and unilateral spinal block for the right lower extremity. Backup plan included general anesthesia and ootracheal intubation with smaller tube, ID-5, or tracheotomy. The patient signed the informed consent, was highly motivated and agreed with both plans.

Conclusions: In our case, knowledge of the techniques involved in regional anesthesia, allows us to perform anesthesia in awake, spontaneously breathing patient.

Case Reports

ESRA7-0324

TRANSMUSCULAR QUADRATUS LUMBOUM BLOCK AS ANESTHETIC TECHNIQUE FOR HIP SURGERY: A CASE REPORT

Moita J., Antunes V., and Fragoso P."Hospital de São Bernardo, Anesthesiology, Setúbal, Portugal. 2Hospital de Braga, Anesthesiology, Braga, Portugal.

Conclusion: CompuFlo® may have a role when identification of the ES with LOR technique fails.

FIGURE 1.
Background and Aims: The transmuscular quadratus lumborum block is a novel regional anesthesia technique described for postoperative pain management after abdominal and hip surgery.

Methods: We report a case of a 71-year-old male presented for closed reduction and internal fixation of intertrochanteric hip fracture, with a medical history of arterial hypertension, diabetes mellitus type 2, smoking and chronic bronchitis. After intravenous (i.v.) premedication with fentanyl, 75 µg, we performed an ultrasound guided, single-shot, transmuscular quadratus lumborum block (30ml ropivacaine 0,5% + lidocaine 0,5%) and a single-shot, translumbar sciatic nerve block (10ml ropivacaine 0,5%). The surgery proceeded under light sedation with propofol, 1 mg/Kg/h. Intraoperative multimodal analgesia was also provided with i.v. paracetamol, 1g and ketorolac, 30 mg.

Results: Sensory blockade was observed over T12 dermatome and total motor blockade in ipsilateral inferior limb. Postoperative pain score (VAS) was 0/10, until 14 hours.

Conclusions: This case demonstrates that transmuscular quadratus lumborum block combined with translumbar sciatic block can be a valid anesthetic option for percutaneous fixation of proximal femur fractures. Nonetheless more cases are necessary to reproduce the results and establish the minimum effective dosage-volume regimen.

Case Reports

ESRA7-0030
PREVENTION OF POSTOPERATIVE RESPIRATORY FAILURE USING ULTRASOUND GUIDED LOW-VOLUME INTERSCALENE BRACHIAL PLEXUS BLOCK FOR AWAKE EXTENDED PROXIMAL HUMERUS FRACTURE SURGERY: A CASE REPORT
Kuwabara A., Hirooka K., Ozaki M., and Nomura M. Tokyo Women's Medical University, Anesthesia, Tokyo, Japan.

Background and Aims: Providing complete anesthesia to the upper extremity remains challenging due to high incidence of phrenic nerve paralysis. We present a case providing intemacral brachial plexus block (ISBPB) to severely ill patient in awake surgery.

Methods: We describe a case providing low volume ISBPB with multiple rescue blocks under ultrasound guidance to a patient with limited pulmonary function requiring extended proximal humerus fixation.

Results: An 88-year-old female diagnosed left proximal humerus single fracture underwent proximal humeral nailing. She presented dyspnea on exertion, hypertension and chronic heart failure. X-rays photography showedhealing scar of tuberculosis on the right lung and tracheal distortion. Spirometry exam showed severe restrictive ventilatory impairment. TTE exam showed a low ejection fraction corresponding with chronic heart failure. The incision line was between C5 and C6. AS a rescue block, 1% xylocaine with dexamethasone was deposited in 5ml each by supraclavicular approach to the posterolateral to the brachial plexus trunk, followed by superficial cervical plexus block, supraacircular nerve block and serratus anterol block. Hemodynamic was stable and no diaphragm paralysis was recognized. A patient discharged without any complications.

Conclusions: The use of low-volume ultrasound-guided ISBPB can avoid diaphragm paralysis. ISBPB combined with rescue blocks and dexamethomidine administration can achieve high quality analgesia for proximal humerus fracture in severely ill patient undergoing awake surgery.

Case Reports

ESRA7-0322
PERMANENT PARAPARESIS AFTER EPIDURAL ANAESTHESIA

Background and Aims: The estimated rate of neurological complications after neuroaxial anesthesia is lower than 4:10.000. Mechanisms of nerve injury include anaesthetic, surgical and patient related factors. We report a case of permanent paraparesis presumably induced by local anesthetic toxicity in a patient previously treated with chemotherapy.

Methods: A 66-year-old man with lung adenocarcinoma, submitted to neoadjuvant chemotherapy, was admitted for a left lower lobectomy and lymphadenectomy thoracotomy. Before induction of general anesthesia, an epidural catheter was placed at T8 level uneventfully. A bolus injection of 8 ml of 0.75% ropivacaine with opioid was administered. Intraoperatively, the patient experienced a prolonged period of hypotension due to surgical bleeding. A second bolus of 0.2% ropivacaine (4 ml) was delivered at the end of the procedure.

Results: After arousal, patient revealed a permanent muscle weakness and reduced sensitivity of the lower limbs. At day 4 splinters incontinence was detected. Ischaemic, haemorrhagic, traumatic, metabolic, endocrine and viral causes were excluded. Electromyography showed a predominantly proximal and bilateral asymmetrical sacrosciatic polyradiculopathy at L2/L3 level.

Final neurological diagnosis was a local anaesthetic induced polyradiculopathy in a patient with a subclinical preceding peripheral polyneuropathy secondary to chemotherapy.

Conclusions: Perioperative nerve injury is traditionally associated with the anaesthetic or surgical technique. However, patient factors must be considered. In this case, pre-existing subclinical neuropathy might have rendered nerves more susceptible to local anaesthetic-induced neurotoxicity.
Background and Aims: The pilonidal cyst is a relatively common variant of the dermoid cyst. In the vast majority of cases, the lesion develops in the terminal region of the spinal column. The causes of the pilonidal cyst have not yet been fully defined.

Methods: Report the case of regional anesthesia evolved with a pilonidal cyst.

Results: A 75 year, ASA III, BMI 36. The double block was performed with a double Braun Depalma double-block team, Whataere needle 27, after two unsuccessful attempts, and a third puncture was performed. The patient was seated, before asepsis with gels imbied in alcoholic chlorhexidine and antisepsis. With success at the L3-L4 level and administration of heavy bupivacaine, clonidine and morphine and subsequent passage of the epidural catheter, a non-interconcurrent procedure. Obtained anesthetic level in T12, with mild hemodynamic repercussions. Patient positioned and sedated. Patient who returns to service 6 days after the procedure, complaining of yellow discharge in moderate amount without odor and slight scaling in the back and evaluated by the anesthesia team of With an erythematous halo and secretion in a small quantity, evaluated and diagnosed cyst, determined to withdraw the cyst through surgery.

Conclusions: With advances in aseptic and antiseptic techniques dermatological lesions have decreased as complications in regional anesthesia, but have pilonidal cyst complications and a chronic disease rarely seen in older adult patients and little reported after the use of regional anesthesia. Special care must be taken in smoking patients, with chronic dermatological lesions to avoid the appearance of lesions in puncture sites.

Case Reports

ESRA7-0401

SUBARACHNOID BLOCK FOR ORTHOPAEDIC SURGERY IN A PATIENT WITH CHARCOT-MARIE-TOOTH DISEASE: CASE REPORT

Rodríguez E., Martínez E., Martín J., Maiza L., and Medina J. Hospital Universitario Doctor Peset, Anestesiología y reanimación, Valencia, Spain.

Background and Aims: The perioperative management of peripheral neuropathies is a major challenge for the anesthesiologist. Charcot-Marie-Tooth disease (CMT) is the most common hereditary sensory-motor neuropathy with an incidence of 1:25000, it’s characterized by progressive distal muscle wasting and weakness, sensory loss, neuropathic pain and the even diaphragm weakness in some patients, caused by defects in myelin structure or direct axon damage. CMT have an increased risk of malignant hyperthermia and sometimes associates with other illnesses like respiratory failure or chronic pulmonary obstructive disease (COPD). Several studies suggests to avoid general anaesthesia but, on the other hand, there are limited data about the use of neuraxial anaesthesia for patients with CMT, most of them case reports, and sometimes has been linked with progression and preexisting neuropathy worsening.

Methods: We describe a case of a patient with CMT and (CPOD) undergoing orthopaedic surgery, after a hip fracture. The patient courses with respiratory failure which contraindicates general anaesthesia. After a literature review, our patient underwent hip replacement surgery under subarachnoid block using hyobaric bupivacaine.

Results: The antaesthesia was performed without immediate complications or postsurgical neuropathy worsening.

Conclusions: The patient with CMT is a complex patient from an anaesthetics point of view. We consider that it’s important to collect all the upcoming cases in order to make a series report that could help us to make an anaesthetic strategy, more accurate and precise for these patients treatment.

Case Reports

ESRA7-0425

ANAESTHETIC APPROACH OF A SUPER MORBIDLY OBESE PATIENT UNDERGONE OPEN THORACIC SURGERY

Siampalioti A., Ziotou A., Sintou H., Koletis E., and Siampalioti A. University Hospital of Patras, Department of Anaesthesia, Rio- Patras University Hospital of Patras, Department of Thoracic Surgery, Rio- Patras, Greece.

Background and Aims: Among the greatest anaesthetic challenge of super morbidly obese patients is the perioperative management of respiratory function, as it’s already compromised in the majority of them. The challenge is raising when they undergo open thoracic surgery. We present a case of a super morbidly obese patient undergone open upper lobectomy.

Methods: A 62 year male with BMI 62kg/m2, MET’s <4, and a medical history of stroke, chronic obstructive pneumopathy and sleep apnea submitted an elective upper lobectomy. Preoperatively, spirometric values were: FVC=2.6L, FEV1=2.12L, and arterial blood gases (ABG’S) in room air were: PHN=7.43, pCO2 =38.4mmHg, pO2=54.2mmHg. Echocardiography revealed left ventricular hypertrophy, EF=60%, increased dimensions of both ventricles and pericardial effusion. General anaesthesia with a double lumen endotracheal tube 39Fr, along with thoracic epidural analgesia (levobupivacaine 2% and fentanyl 2ug/ml, 5ml/h and bolus 5ml every 10 minutes) at the T5 – T8 interspace, was decided as the most appropriate anaesthetic management. Cerebral oximetry (INVOS 100D) and Bispectral index was applied in addition to the basic monitoring.

Results: Intraoperatively, the patient was hemodynamically stable, while ventilation was satisfactory, despite the 45 minutes of one lung ventilation. Cerebral oximetry and Bispectral index remained within normal limits (BIS=45-55, INVOS variation <10%). Postoperative ABO’s were: FiO2≥35%, pH=7.4, pCO2 =38.9mmHg, pO2 =115mmHg and epidual analgesia was excellent.

Conclusions: Thoracic epidural analgesia is safe and effective in super morbidly obese patients undergoing thoracotomy, resulting in improved respiratory function postoperatively, and therefore reducing the need of ICU stay after high risk surgeries.
Case Reports

ESRA7-0454

A CASE OF RESPIRATORY DEPRESSION FOLLOWING COMBINED ANESTHESIA WITH INTRATHECAL MORPHINE FOR A LARGE PARACOLOSTOMY HERNIA REPAIR


Background and Aims: Spinal administration of an opioid is recognized as effective in providing a long period of postoperative analgesia. Respiratory depression is a known and dangerous side effect of neuraxial opioids and its use has been limited by it. We report a case where a combined anesthesia, with the use of intrathecal morphine, was followed by an episode of respiratory depression, endotracheal intubation and admission in an Intensive Care Unit (ICU).

Methods: 52-year-old male, ASA III (Crohn’s disease, obesity, hypertension, dyslipidemia, ex-smoker), posted for paracolostomy hernia repair (Figure 1). Due to the size of the hernia, we chose a combined spinal and general anesthesia. After intrathecal injection of 0.25 mg of morphine at L2-L3 interspace, we performed a rapid sequence induction and intubation (RSII) with videolaringoscopy.

Results: The spinal technique and RSII were performed successfully at first attempt. The surgery was uneventful and lasted for 2h25min. Postoperatively, he remained hemodynamically stable, eupneic, pain-free and without motor block or neurologic adverse effects. However, 8 hours after the procedure, the patient developed symptoms of respiratory depression, endotracheal intubation and admission in an Intensive Care Unit (ICU).

Conclusions: With the recognition of the effectiveness of neuraxial opioids for postoperative analgesia, this technique is increasing in many surgical settings. Nonetheless, there is a persistent concern about its adverse effects, particularly respiratory depression. To minimize this problem, we need to establish strategies to improve the safety of these drugs.

Case Reports

ESRA7-0166

CASE REPORT: SUCCESSFUL REGIONAL ANESTHESIA FOR AWAKE FIBER OPTIC INTUBATION IN A RARE CASE OF GRISEL’S SYNDROME

Memary E., Mirkheshti A., Tabashi S. Imam Hossein Educational Hospital, Anesthesiology, Tehran, Iran.

Background and Aims: Grisel’s syndrome is a rare disorder, occurring secondary to inflammatory processes and neck surgery. It involves subluxation of atlanto-axial joint. Its presentation consists of torticollis, neck pain and stiffness, cord compression and possibly death from acute respiratory failure. In these patients, tracheal intubation may be extremely difficult because of many reasons such as positioning, limited neck movement, mouth opening and unstable cervical spine.

Methods: A 29-year-old man with Grisel’s syndrome was referred to our hospital for cervical spine C1-C2 reduction and fixation. His complaint was acute onset of painful torticollis with the right rotation of head since 5 months ago. His neck extension gradually made him sleep in sitting position and was fixed anterolaterally with less than 2 fingerbreadth from right clavicle. He was scheduled for the surgery as paresthesia in hands, decreased force in all extremities and urinary incontinency was developed.

Results: Awake nasal fiberoptic intubation with airway nerve block was planned. Glossopharyngeal, superior laryngeal nerve and transtracheal blocks were administered by admixture of lidocaine 2% and dexmedetomidine. Then flexible scope intubation was performed in the awake patient. Patient was fully awake and cooperative for prone positioning.

Conclusions: Grisel’s syndrome should be considered as difficult airway and we experienced that awake fiberoptic intubation after nerve blocks with adding dexmedetomidine to lidocaine can greatly facilitate intubation in these patients.

Case Reports

ESRA7-0393

ANAESTHESIA IN A PARTURIENT WITH PSEUDOACHONDROPLASIA PRESENTING FOR ELECTIVE CAESAREAN SECTION

White A., Phylactides L., Wood T., and Hammond S. St George’s Hospital, Anesthetics, London, United Kingdom.

Background and Aims: Pseudoachondroplasia is a cause of dwarfism. In addition to severe short stature, there may be other clinical features with implications for obstetric anaesthesia. We describe a case of the successful management...
A forty-year-old, G1P0, with pseudoachondroplasia presented for no complications such as bronchospasm, irritable airways or excessive coughing occurred peri/postoperatively.

Methods: The clinician should practise a safe and practical combination of techniques for rigid bronchoscopy procedures. Here, we suggest that a quick reversal plan with rocuronium-sugammadex in combination with topical use of local anaesthetics diluted for paediatric patients should be considered to decrease airway irritation and reactivity during peroperative period of emergent bronchoscopy.

Conclusions: The patient had an uncomplicated recovery and was discharged home two days later.

Conclusions: The jury is out as to the ideal mode of anaesthesia for caesarean section for a parturient with dwarfism. We report successful use of a CSE. We advocate the use of a titratable regional technique, primarily the CSE. Case reports reveal a variation in spinal dose of bupivacaine with an unpredictable block height. To have the option to supplement the block if necessary via epidural catheter is desirable. Most importantly, a thorough and timely assessment at the obstetric anaesthetic clinic is essential for the safe management of these high-risk parturients.

Case Reports

ESRA7-0338

EMERGENCY BRONCHOSCOPY FOR TRACHEOBRONCHIAL STONE ASPIRATION IN A CHILD - A GOOD RECOVERY EXPERIENCE WITH ROCURONIUM-SUGAMMADEX AND DILUTED LIDOCAINE IRRIGATION OF THE AIRWAYS

Calisik E., Yalcin Cok O., and Aribogan A. Baskent University- School of Medicine- Adana Research and Education Center, Anaesthesiology and Reanimation, Adana, Turkey.

Background and Aims: Tracheobronchial foreign body aspiration is one of causes of childhood morbidity and mortality. Early and unproblematic removal of foreign body may be life-saving. Hereby, we present our experience with rocuronium-sugammadex and diluted lidocaine spray in a child who underwent emergency bronchoscopy due to stone aspiration.

Methods: A 8-year old, 19 kg girl with mental retardation and ventriculoperitoneal shunt admitted for suspected stone aspiration. Physical examination revealed stridor, increased respiratory rate, decreased ventilation on her right side, chest X-ray demonstrated unilateral air-trapping. Anaesthesia was induced with midazolam 1mg, atropine 0.02mg/kg iv and sevoflurane via mask preserving spontaneous ventilation. Due to the nature of the foreign body, its possible injury to the trachea while removing and subsequent possibility of irritable airway, we pre-conditioned the airway with topical lidocaine 10% spray diluted with a 1:4 ratio with saline to increase the volume and decrease toxicity risk. Six doses, approximately 15 mg washed the entire airway before starting the bronchoscopy. Rocuronium 0.4 mg/kg 1 was administered to facilitate the procedure and followed by sugammadex 2 mg/kg 2 after 10 minutes when the stone was removed. TOF monitoring was evaluated as 0.96 at 12th min.

Results: No complications such as bronchospasms, irritable airways or excessive coughing occurred peri/postoperatively.

Conclusions: The patient gave his consent for this presentation.

Methods: Our patient was a 75 year old man who was admitted to a medical ward with an infective exacerbation of COPD. His past medical history was significant and included bronchiectasis, severe COPD on 24 hours oxygen therapy, atrial fibrillation, pulmonary embolism. His exercise tolerance was few metres. During the admission he developed abdominal pain and was diagnosed with an incarcerated paraumbilical hernia. Anaesthetic review concluded that he was a very high risk patient for a general anaesthetic. Therefore it was decided to perform the surgery under rectus sheath block. Under ultrasound guidance 10 ml of 0.5% bupivacaine was administered between the rectus abdominis muscle and posterior rectus sheath on each side. The surgeons supplemented the block by infiltrating the skin and subcutaneous tissues with 15 ml 1% lidocaine with adrenaline. A defect about 1 cm was found, the sac contained the omentum and extraperitoneal fat. Intraoperatively the patient was given 1 g paracetamol, but no sedation or any further analgesia. He remained comfortable and pain free throughout the surgery.

Conclusions: Advances in regional anaesthesia have made it possible to anaesthetise patients with significant medical co-morbidities.

Case Reports

ESRA7-0365

INCARCERATED PARAUMBILICAL HERNIA REPAIR UNDER RECTUS SHEATH BLOCK IN A PATIENT WITH SIGNIFICANT MEDICAL CO-MORBIDITIES

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Background and Aims: We describe a case of an open surgical repair of a paraumbilical hernia performed under rectus sheath block.

Methods: The patient was transferred to intensive care unit, where she was kept intubated and sedated overnight. Infusions of 0.1% ropivacaine at 5ml per hour was started for each TAP block catheter. The patient was extubated the next day. Oral analgesics such as paracetamol, diclofenac and tramadol were given as needed.

Results: The patients were removed. There was no pain at rest and mild pain on movement when she was reviewed daily. She was able to sit out of bed and participate in physiotherapy on POD 2 and ambulable in the ward on POD 3.

Conclusions: Regional anaesthesia is useful, especially for hypothyroid patients, to reduce risk of sedation and respiratory depression. Hypothyroid patients are likely to have lower analgesic requirements.
However, patients with severe pulmonary disease may be good candidates for subarachnoid anesthesia. It's essential a multidisciplinary evaluation to weigh the benefits and risks of these options.

**Methods:** A 75-year-old female, ASA III with an acoustic neuroma (active hydrocephalus in 2015 responsive to evacuated lumbar punctures), was admitted for total replacement of the right knee.

Preanesthetic evaluation revealed a class II Mallampati score and restricted neck mobility.

**Results:** Patient was monitored according to ASA standards and cerebral oximetry.

We performed a single-shot subarachnoid block in the intervertebral space L4-L5 using 8mg of levobupivacaine (0.5%) and 0.002mg of sufentanil. Before the injection of anesthetic, 2ml of cerebrospinal fluid was drained.

During the procedure the patient remained awake. The procedure lasted for 1h50min; the surgery and immediate postoperative period was uneventful. In the PACU, femoral nerve block with catheter insertion was performed and then PCEA was used.

There were no symptoms of intracranial hypertension during the postoperative period.

**Conclusions:** In this case, the subarachnoid anesthesia was considered the best option. At the moment of the procedure, there were no symptoms of intracranial hypertension and we choose, after a multidisciplinary evaluation, the withdrawal of cerebrospinal fluid corresponding to the anaesthetic volume used. During the surgery, it was possible to evaluate the neurological status and no deterioration was detected.

Central Nerve Blocks

**ESRA7-0237**

**LOW VOLUME INTERSCALENE BRACHIAL PLEXUS BLOCK FOR SHOULDER HEMIARTHROPLASTY IN ELDERLY WITH PULMONARY DISORDERS**


**Background and Aims:** Shoulder hemiarthroplasty can be performed under general anaesthesia, regional anaesthesia or a combination of both. Regional anaesthesia alone can be extremely useful in elderly patients in whom general anaesthesia can be detrimental. We present two cases of elderly patients with pulmonary disorders operated under regional anaesthesia with uneventful preoperative period.

**Methods:** Case 1: 64 years old, ASA 3 male with hypertension, chronic obstructive pulmonary disease with bilateral crepitations, respiratory rate 16/min, SpO2 92% on room air. Case 2: 70 years old, ASA3 male with diabetes mellitus, hypertension and bronchiectasis with bilateral coarse crepitations, respiratory rate 15/min, SpO2 94% on room air. Both cases, ultrasound guided inter scalene brachial plexus block was given with 7ml of 0.5% L-bupivacaine in lateral position. In addition, superficial cervical plexus block and local infiltration in deltopectoral groove were given. Intravenous dexamethasone 8mg was given. No difficulty in breathing noted. Electrocardiogram, Pulse rate, blood pressure, oxygen saturation, respiratory rate were monitored throughout the peri-operative period.

**Results:** Surgery commenced after confirmation of anaesthesia of the operative site. The two patients did not require any supplementation with general anaesthesia. Shoulder support provided with immobiliser postoperatively. Both the cases had an uneventful peri-operative period without respiratory complications. Oral intake commenced immediately in the recovery room.

**Conclusions:** Good operative conditions can be provided with low dose inter scalene brachial plexus, superficial cervical plexus and intercostobrachial nerve blocks and excellent postoperative analgesia.

**Background and Aims:** Patients with thyroid disease may have distorted anatomy significantly increasing their risk of complications resulting from attempts at blind interscalene or supraclavicular brachial plexus blockade. It has been speculated that ultrasound guidance might increase success rates and reduce complications.

**Methods:** A 52 year old female patient with right shoulder pain for 2 months was admitted for arthroscopic Bankart’s repair. Patient had no history suggestive of thyroid dysfunction. No obvious neck swelling was seen. Her thyroid profile was also in normal limits T3-88ng/dl; T4-14.1μg/dl; TSH-2.31μIU/ml.

Pre-procedural consent was taken for regional block and general anaesthesia. In the operative room standard monitors [ECG, NIBP, SpO2] were applied. Intravenous cannula 18G was secured in the left hand. Patient was positioned with neck turned to left side and pillow under the shoulder. Pre-procedure scan showed a distorted anatomy with a large uniformly enlarged right lobe of thyroid pushing the carotid artery, internal jugular vein, scalene muscles and brachial plexus laterally and posteriorly. Since the conventional position would have been difficult for performing the block, the patient was put in lateral position with the operative limb on the non-dependent side.

![Figure 1. Stitched ultrasound image of the right side of the neck in transverse axis depicts the enlarged right lobe of thyroid pushing the common carotid artery, internal jugular vein and interscalene branchial plexus laterally. CA-Common Carotid Artery, IJV-Internal Jugular Vein, ASM-Anterior Scalene Muscle, MSM-Medial Scalene Muscle, ISBP-Interscalene Brachial Plexus, SCM-Sternoceleidomastoid.]

**Results:** Thyromegaly was identified in this case only because pre-procedural ultrasound is a part of our routine practice. Going by anatomical landmark technique would have resulted in inadvertent vascular puncture or injection of local anaesthetic in the thyroid gland.

**Conclusions:** Ultrasound guidance for brachial plexus blockade not only improves the quality of regional anaesthesia but also reduces the complications associated with landmark techniques especially with anomalous brachial plexus.
Methods: Data was collected over a 12-month period. Every patient admitted with fractured ribs was enrolled in data collection. Patient age, co-morbidities, mode of analgesia, quality of pain relief, time from referral to epidural insertion, respiratory support requirement and side effects were recorded and analyzed.

Results: 42 patients were included in the data collection. Patients were divided into two groups, Group A received epidural or paravertebral block (n=35) and Group B oral/PCA analgesia (n=7). 32 out of 35 patients in epidural group were complaining of severe pain on admission which was reduced to ‘NO’ in 48% of patients within two hours. 71% in Group B was complaining of mild pain after two hours commencing treatment, pain free period was not achieved. 85% of patients were managed on the ward, only 12% required IV/IPPV.

Conclusions: An early and appropriate pain management of fractured ribs is essential, especially in elderly patients. It allows adequate respiratory effort, reduces complication rate and hospital stay. The diamorphine alone epidural has proven to be an effective form of analgesia which could be delivered on the ward with regular support from the acute pain team.

Central Nerve Blocks

ESRA7-0101

CONTINUOUS SUBARACHNOID BLOCKADE FOR AN OPEN REDUCTION OF TOTAL HIP ARTHROPLASTY DISLOCATION

Cardoso J.M., Sá M., Correia Brandão J., Graça R., Pereira A.L., and Machado D.

CHTMAD, Anesthesiology and Pain Medicine, Vila Real, Portugal.

Background and Aims: Although continuous subarachnoid blockade (CSB) isn’t devoiced of risks, it can be very useful in certain cases because it allows gradual titration of blockade and rescue boluses if needed. Patients submitted to emergency procedures may present additional challenges due to acute dysfunctions, asking for an inventive anesthesiologist.

Methods: We performed a CSB for an open reduction of a THA in a ASA IV 80 year-old male patient with known history of kidney transplant, diabetes mellitus type 2 under insulin-therapy, chronic obstructive pulmonary disease, heart failure, severe aortic stenosis, left ventricle hypertrophy, arterial hypertension, dyslipidemia, obesity (BMI = 31.3 Kg/m²) and a stage 4 pulmonary non-Hodgkin lymphoma. The patient had been submitted to a THA 3 weeks before due to a proximal femur fracture. Blood results showed an acute graft dysfunction and leukocytosis. We put an arterial catheter for invasive blood pressure monitoring.

Results: A total 3.75 mg of 0.25% LevoBupivacaine and 2 ug of Sufentanil were injected through the subarachnoid catheter until a sensory blockade of Th10 was achieved. The patient’s blood pressure remained stable. He reported no pain throughout the surgery, which took 1h15min to be completed. The surgeons found an intact and dislocated THA. Due to the patient status, THA reduction was the sole procedure. The subarachnoid catheter was withdrawn at the end of surgery.

Conclusions: CSB can be an excellent option in patients with major pathology. A subarachnoid catheter allows good and gradual titration of blockade and minimizes hemodynamic repercussions.

Central Nerve Blocks

ESRA7-0212

PREDICTING MID-THORACIC EPIDURAL SPACE DEPTH USING BIOMETRIC PARAMETERS - A PRELIMINAR CASE STUDY

Castro L.1, Pereira D.1, Paulo J.1, Afonso J.1, Correia J.1, Ferreira M.1, Silva M.1, Castro C.2, Miranda M.L.1, and Sarmento M.C.1 1Instituto Português de Oncologia do Porto, Anesthesia and Intensive Care, Porto, Portugal, 2Instituto Português de Oncologia do Porto, Epidemiology, Porto, Portugal.

Background and Aims: There are several tools (anthropometric formulas, ultrasound, CT scan, MRI) to estimate the depth of the thoracic epidural space. Despite having many fans, the regular use of imaging techniques is time & money consuming, requires a long learning curve by Anesthesiologists, and isn’t always available preoperatively.

In another previous study presented as e-poster in ESRA 2014, we found a statistically significant relationship between weight/height and DSmTES, which allowed us to reach the empirical equation: DSmTES = 4.3 + 0.044*weight, but couldn’t include height, because it entered as a categorical variable.

Our aim was to include both biometric parameters in the empirical formula to estimate more accurately the average distance skin to mid-thoracic epidural space (DSMTEs).

Methods: The study included 153 patients (105 men, 48 women), submitted to combined anesthesia with thoracic epidurals for lung/oesophageal resection with effective postoperative analgesia (TEA). All patients gave their written consent.

Mann–Whitney and Kruskall–Wallis tests were used to evaluate differences in DSMTEs according to sex, age and epidural space, and Spearman coefficient was used to evaluate correlation between DSMTEs and age/height/weight.

Results: DSMTEs was 7.5 cm (range 3.0-12.0), was higher amongst men (p=0.018). A significantly correlation was found with height (p=0.001, R=0.400), and weight (p<0.001, R=0.420). No differences were found between mean of patients concerning epidural spaces, although DSMTEs was deeper in T3-T6.

Age had no correlation with DSMTEs (p=0.924).

Conclusions: In this study, we were able to find this empiric formula, including weight and height:

DSMTEs = -2.347 + 0.032*weight + 4.513*height

More studies will be required to access the correlation coefficient between estimated/real DSMTEs.

Central Nerve Blocks

ESRA7-0038

HYPOBARIC ROPIVACAINE (0.1%) IN SPINAL ANESTHESIA WITH OR WITHOUT LOW-DOSE CLONIDINE OR FENTANYL FOR ANORECTAL SURGERY

Diaslamna S., and Tiwari T. King George’s Medical University; Anaesthesiology and Critical Care, Lucknow, India.

Background and Aims: Perineal and anorectal surgeries performed on an outpatient basis under spinal block. Spinal anesthesia has better cost efficacy and is very well accepted by patients. Ropivacaine is less toxic with rapid motor recovery. Clonidine provides dose-dependent analgesia. Intrathecal opioids decrease nociceptive afferent input without affecting dorsal root axons. The present study was designed to compare the onset, the level, and the duration of sensory and motor blockade occurring after the administration of low-dose hypobaric ropivacaine (0.1%) either alone or with clonidine or fentanyl in spinal anaesthesia for anorectal surgeries in jack-knife position.

Methods: This was a prospective, randomized, double-blind and comparative study. A total of 60 ASA grade I-III patients were randomized into three groups.

Results: The plain ropivacaine group had a significantly higher heart rate. The addition of fentanyl resulted in a stable heart rate, but with the addition of clonidine, there was a decrease in the heart rate from the baseline. Mean arterial pressure (MAP) in the ropivacaine group was significantly higher in comparison with the clonidine or the fentanyl groups. None of the patients in any of the groups had complete motor blockade (Bromage score ≥ 3) at any time. After 2 h, there was complete regression (Bromage score = 1) in all the patients in all the groups.

Conclusions: Hypobaric ropivacaine provides adequate surgical conditions for anorectal surgeries. Intrathecal clonidine with 0.1% hypobaric ropivacaine is a better adjuvant than fentanyl as it prolongs the duration and improves the quality of the sensory block and provides long postoperative analgesia.

Central Nerve Blocks

ESRA7-0221

A TOOL FOR IMPROVING THE QUALITY OF EMLA APPLICATION PRIOR SPINAL ANESTHESIA

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Background and Aims: Cutting the application of EMLA cream improves patients’ comfort during lumbar puncture. Correctly applied, it covers zone of
skin limited by 2 cm from the median line L2-L5, and protected by a film. The practice of EMLA application is known by nurses, however the quality remains unstable. We conducted a quality improvement initiative and developed a tool to enhance compliance with a practice standard.

**Methods:** Before/after observational design. Correlation of patients and details of EMLA use were analyzed. A questionnaire for nurses on EMLA application practices and spinal anatomy was administered. A tool - transparent film with an oftice corresponding to EMLA zone application, median spinal line, and transversal iliac crests lines marks - was developed, and systematically used for 1 week between 2 phases, with subsequent evaluation of usability (System Usability Scale). Spinal anatomy was recalled. Oral content was obtained from participating nurses.

**Results:** A total of 100 consecutive (before/after - 50/50) patients observed. Initial compliance of EMLA application was 70%, non-related to copulence or prescriptions. 25 nurses were evaluated, 68% provided correct answers regarding EMLA application practices. After 1 week of a tool use there was 96% compliance of EMLA application, and 96% correct answers. The usability of developed tool was 80/100 SUS. 24% of nurses used it only one time, indicating the necessity of a single use version (hygiene).

**Conclusions:** Significant improvement of EMLA application quality was achieved using a simple tool. The usability of this tool was good, the development of a disposable single use version was suggested by nurses.

Central Nerve Blocks

**ESRA7-0402**

**SPINAL BUPIVACAINE – DEXMEDETOMIDINE FOR LOWER LIMB AMPUTATION SURGERY: POSSIBLE EFFECTS ON EARLY STUMP PAIN AND PHANTOM PAIN**

Hammond G. E.1, Zaghboola H.2, Faild A. M.3, Elrahmawy G. F.4, and Shalaby S. Y.5 1Faculty of Medicine-Mansoura University, Anesthesia and Intensive Care, Mansoura, Egypt. 2University at Buffalo, Vascular Surgery, Buffalo, USA.

**Background and Aims:** Studies demonstrated most postoperative management for phantom-limb pain are ineffective. Dexmedetomidine may be an additive with spinal anesthesia for pre- and postoperative phantom pain (PPP) in lower limb amputation patients.

**Methods:** Sixty patients enrolled in prospective, randomized, and double-blinded study. Pre- and PPP Phantom limb assessed for up to 30 days. Group B received hyperbaric 0.5% bupivacaine 10–15 mg and 0.5 ml of normal saline. Group BD received hyperbaric 0.5% bupivacaine 10–15 mg and 5 μg dexmedetomidine in 0.5 ml of normal saline. Informed consent obtained from all patients prior to enrollment in this study and ethics committee granted approval.

**Results:** Similar demographics, co-morbidities, preoperative pain and heart rate (HR), and surgery duration among the groups. Postoperative HR, blood pressure, total fluids and epididymal administered, nausea, and vomiting was not significant. Post-operative verbal rating scale showed a significant pain decrease in BD group at 4h (median 4 [range 3–7] vs. median 3 [range 0–5]; p = 0.001) up to 8h (median 4 [range 3–6] vs. median 3 [range 2–6]; p = 0.02) compared with B group. Dichotomous in the first 48 hours postoperatively decreased in BD group vs. B group (308.33 ± 38.47 vs. 176.67 ± 59.70; p < 0.001). PPP in the 1st month did not differ between the two groups.

**Conclusions:** Intrathecal dexmedetomidine prolongs the duration of sensory and motor block with reduction of post-operative analgesic requirements with hemodynamic stability in compared to hyperbaric bupivacaine alone. No effect on incidence or severity of PPP in lower limb amputation surgery.

Central Nerve Blocks

**ESRA7-0321**

**LAPAROSCOPIC CHOLECYSTECTOMY UNDER SPINAL ANAESTHESIA: A CASE REPORT**

Faisco A., Lopes L., Reis E., Alexandre G., Inacio R., Ribeiro J., and Serrano A. Hospital Professor Doutor Fernando Fonseca, Anesthesiology; Amadora, Portugal.

**Background and Aims:** Laparoscopic cholecystectomy is the gold-standard treatment for symptomatic cholelithiasis. It is usually performed under general anaesthesia. Neuromuscular blockade or subarachnoid block is often used to facilitate the procedure. However, both are associated with side-effects. The purpose of our study was to compare efficacy, motor blockade and postoperative analgesia in pediatric patients who underwent laparoscopic cholecystectomy.

**Methods:** After ethics committee approval. 84 children aged 1-18 years were scheduled for laparoscopic cholecystectomy under general anesthesia. General anesthesia and monitors were standardized. A 2% rocuronium was given before insertion of a C-1070G or C-1010G laryngeal mask airway. Anesthesia was induced with propofol and fentanyl. After intubation, patients received 0.8 mg/kg fentanyl and 0.6 mg/kg rocuronium. The inspiratory oxygen concentration was maintained at 40% and compressed gas oxygen was administered during surgery. Side effects were recorded, and the patients were observed for 24 hours after surgery.

**Results:** The incidence of residual motor blockade was 32% with levobupivacaine/midazolam and 68% with levobupivacaine/clonidine (P = 0.004). At 24 hours none of the patients in the levobupivacaine/midazolam group and 14% in the levobupivacaine/clonidine group had residual motor blockade (P = 0.248). Requirement of rescue drugs for postoperative pain control was similar in both groups (P=0.615). (Figure 1)
**Conclusions:** Either levobupivacaine/midazolam or levobupivacaine/clonidine provide similarly effective caudal epidural analgesia for herniotomy in children but less residual motor blockade was an additional advantage with levobupivacaine/midazolam ensuring a fast recovery and discharge of patients.

**Central Nerve Blocks**

**ESRA7-0213**

**UNINTENTIONAL REVERSIBLE IATROGENIC LOWER LIMB MOTOR DEFICIT AFTER SUBARACHNOID ANAESTHESIA DUE TO ABNORMAL LOCALIZATION OF THE LOWER BOUNDARY OF THE SPINAL CORD: A CLINICAL CASE**

Kama W., and Golyanischev M. Centre hospitalier Elyoussef, Halba., Department of anesthesiology and intensive care., Akkar., Lebanon.

**Background and Aims:** Modern international recommendations help anesthetists avoid side effects and complications of subarachnoid anesthesia (SAA). We described the clinical case of direct spinal cord injury during the conducting of the SAA to emphasize the importance of developing interdisciplinary recommendations for the prevention and treatment of complications of this genesis.

**Results:** SAA for Patient A. was conducted according to planned indications, after standard preparation. The insertion of the needle into the subarachnoid space L2-L3 was without technical difficulties. After the needle entered the subarachnoid space, the patient marked dysesthesia (left limb). The position of the needle was changed to L3-L4 then the liquor was obtained with normal characteristics. Then spinal anaesthesia went without distinction. In the next day, some disorders were noted: pain, numbness, motor deficit in the left leg, which required consultation of a neuro surgeon. The treatment was prescribed, which had a positive effect for 10 days. Stable neurologic effects were not observed before discharge or screening through 12 months.

The presence of a low level of the spinal cord, which ends in L3-L4, had been revealed from the data of the IRM of the lumbar spine. This had confirmed the zones of the intramedullary hyper-signal in the T2 band and the isosignal in the T1 band more than 3.8 cm in height between L2-L3 (Figure 1).

**Conclusions:** The urgency of the development of methods for the preliminary detection of risk factors for abnormalities in the structures of the spinal cord and recommendations for anaesthesia in these patients is shown.

**ESRA7-0464**

**ULTRASOUND-ASSISTED SUBARACHNOID ANESTHESIA IN SEVERE SCOLIOSIS**

Graça R., Cardoso J.M., Pinheiro C., and Machado D. Centro Hospitalar de Trás-os-Montes e Alto Douro, Department of Anesthesiology and Pain Medicine, Vila Real, Portugal.

**Background and Aims:** Neuraxial ultrasound is a recent development in the regional anesthesia and is a useful complement for lumbar neuraxial blocks. It provides anatomical information that can be used to guide subsequent needle insertion, improving the precision and efficacy of neuraxial blockade reducing the risk of traumatic procedures.

We performed ultrasound-assisted subarachnoid anesthesia in a old woman with severe scoliosis.

**Methods:** Woman, 89 years-old, ASA 2, 42 kg, with transient ischemic attack suspected many years ago and severe scoliosis, scheduled for a repair of subtrochanteric fracture with a long intramedullary nail. The patient had history of not achieved spinal block and she took acetylsalicylic acid regularly.

We performed ultrasound-assisted midline approach of subarachnoid anesthesia with levobupivacaine 0,5% 2,5 ml plus levobupivacaine 0,25% 5ml, using a quincke 27 gauge needle. The technique was achieved with only one no traumatic puncture. Was performed an analgesic femoral nerve block and lateral cutaneous nerve block. Intra-operative intravenous analgesia consisted of 1g paracetamol.

**Results:** Neuraxial ultrasound identifies lumbar intervertebral levels, with greater accuracy than palpation of surface anatomical landmarks. In our case, neuraxial ultrasound increased the efficacy of spinal anesthesia by decreasing the risk of failure and decreasing the number of needle punctures required in a patient taking acetylsalicylic acid regularly.

We performed ultrasound-assisted midline approach of subarachnoid anesthesia with levobupivacaine 0,5% 2,5 ml plus levobupivacaine 0,25% 5ml, using a quincke 27 gauge needle. The technique was achieved with only one no traumatic puncture. Was performed an analgesic femoral nerve block and lateral cutaneous nerve block. Intra-operative intravenous analgesia consisted of 1g paracetamol.

**Conclusions:** By increasing the accuracy of needle placement and decreasing the number of needle passes, ultrasound may result in less traumatic procedures. This technique hasn’t a long learning curve and don’t take too much time and could be a resource for the spinal anesthesia.
Central Nerve Blocks

ESRA7-0306

EFFECT OF SEGMENTAL THORACIC EPIDURAL BLOCK ON PANCREATITIS INDUCED ORGAN DYSFUNCTION: A PRELIMINARY STUDY

TYAGI A., GUPTA Y., KUMAR M., and SETHI A.K. University college of medical sciences and GTB hospital, Anaesthesiology and Critical care, Delhi, India.

Background and Aims: Thoracic epidural block (TEB) may improve microcirculation, tissue damage, and oxygenation in pancreas hence improving organ dysfunction and survival in acute pancreatitis (AP).

Effect of TEB on SOFA score and surrogate markers of morbidity in patients with predicted severe AP.

Methods: Prospective preliminary study included patients of AP with SIRS or APACHE II >8 on admission or 48 hours later. With any contraindication to TEB excluded.

All management same except TEB in group TE, or its absence in group NTE (n = 12 each).

TEB at Th-9 or Th-10 inter-vertebral level, followed by bolus and then infusion of ropivacaine (0.2%) to maintain numerical rating score (NRS < 4); continued for 96 hours or till required, whichever earlier.

Statistical analysis: Data compared between groups using non-parametric tests (Mann-Whitney). P-value < 0.05 considered statistically significant.

Results: Patient characteristics and diagnostic criteria of AP in both groups were statistically similar (p > 0.05) (Table 1).

Aggregate SOFA score statistically similar, though clinically greater, in group TE as compared to group NTE (4 [3 – 4.8] versus 2 [2 – 3.8]) (p = 0.234). Daily SOFA score improved with time in group TE while it worsened in group NTE (Table 2). Surrogate markers of morbidity showed better recovery in group TE than group NTE (P<0.05) (Table 3). No major complications were seen with TEB; 1 patient needed ephedrine bolus after the block.

Conclusions: The use of TEB in patients of acute pancreatitis results in an insignificant trend towards clinical improvement (p > 0.05).

Conclusions: There is a potential of serious side effects with intrathecal Diamorphine overdose; however, these patients can be safely managed by observation alone in a high dependent unit and routine administration of Naloxone may not be required.

Central Nerve Blocks

ESRA7-0260

ACCIDENTAL INTRATHECAL ADMINISTRATION OF HIGH DOSE DIAMORPHINE

Jafar F.,1 and Chowdhury P.2 1Western General Hospital, Anaesthetics, Edinburgh, United Kingdom, 2West Middlessex Hospital, Anaesthetics, London, United Kingdom.

Background and Aims: Spinal opiates are used in order to reduce the dose of local anaesthetics, improve the quality of block and to provide extended period of postoperative analgesia. Our aim to present this case is to report dose related analgesia and adverse effects of inadvertent administration of high dose intrathecal diamorphine.

Methods: A 52 years old female was planned for total knee replacement under spinal anaesthesia. After giving spinal medications, it was realized that wrong syringe was used and diamorphine instead of bupivacaine was injected. When no motor or sensory block was achieved after 15 minutes, decision was made to convert into general anaesthesia. General anaesthesia was induced with Propofol, Fentanyl and Rocuronium and maintained with Sevoflurane, N2O and Oxygen.

Results: Patient was extubated after conclusion of surgery. There was minimal coughing and ETT tube was tolerated very well till the time she was extubated. She remained asymptomatic and didn't require any antibiotics, analgesia or naloxone. Her respiratory rate on average was 15 per minute. Her pain scores were 0 to 1 during the first 48 hours after the surgery. The rest of her recovery period was uneventful.

Conclusions: Established hospital guidelines on surgical clips should be in place to minimise the delay in patient situations which might have negative impact on patient outcomes.

Conclusions: There is a potential of serious side effects with intrathecal Diamorphine overdose; however, these patients can be safely managed by observation alone in a high dependent unit and routine administration of Naloxone may not be required.

FIGURE 1.

Central Nerve Blocks

ESRA7-0421

SUSPECTED EPIDURAL HAEMATOMA AND SURGICAL CLIPS: CASE REPORT

KUPPUSWAMY MOHANRAJ A. Wigan, United Kingdom.

Background and Aims: A 74 year old female patient with 2nd revision hip replacement with an epidural catheter in situ developed symptoms suggestive of epidural haematoma on the 3rd post operative day. With surgical clips in place at the operated site MRI scan of the spine was delayed due to concerns of surgical clips displacement and heating under the MR scanner. MR scan was performed later that evening after contacting the surgical clip company for MR safety.

Methods: Literature search was initiated after deciding the search words and performed in Pubmed and EMBASE. Results were de-duplicated using RefWorks.

Results: 1. Most of the surgical skin clips currently in use are either non ferromagnetic or least ferromagnetic and are deemed safe during MR scans as long as the strength of the MR scanner is less than 3TESLA.
2. The Medicines and Healthcare products Regulatory Agency (MHRA) has produced guidelines recommending that hospitals must make provisions for correct identification, documentation, imaging and aftercare for patients with implantable medical devices requiring MRI scanning [2]. These are updated annually. These are as follows
3. No case reports (15 years search period) were identified pertaining to surgical clips causing tissue damage or migration under MR scanner.
4. At least 5 case studies were found testing different skin clips effect under MR scanner (3 with 1.5 TESLA and 2 with 3 TESLA) and results were reported safe.

<table>
<thead>
<tr>
<th>Surgical clip</th>
<th>MRI safety</th>
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<tbody>
<tr>
<td>Ethicon Absorbable</td>
<td>Safe</td>
</tr>
<tr>
<td>Ethicon Ligature (1st)</td>
<td>Safe</td>
</tr>
<tr>
<td>Ethicon Ligature (2nd)</td>
<td>Safe</td>
</tr>
<tr>
<td>Ethicon Ligature (3rd)</td>
<td>Safe</td>
</tr>
<tr>
<td>Ethicon MCM 20</td>
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<tr>
<td>Ethicon MCT 25</td>
<td>Safe</td>
</tr>
<tr>
<td>Ethicon MSL 40</td>
<td>Safe</td>
</tr>
<tr>
<td>Asepto Medical Ti-clip</td>
<td>Safe</td>
</tr>
<tr>
<td>Ethicon Contour</td>
<td>Conditional</td>
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<td>Ethicon Environ</td>
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Central Nerve Blocks

ESRA7-0304

COMPARISON OF SUBARACHNOID BUPIVACAINE VERSUS PRILOCAINE FOR CERVICAL CERCLAGE

Nalla Pillai A, 1 Mudanna A, 2 Kuppuswamy Mohanraj A, 1 Wigan, United Kingdom. 2 Guys and St. Thomas Hospital- London, London, United Kingdom.

Background and Aims: To compare prilocaine with fentanyl vs bupivacaine with fentanyl for cervical cerclage procedures.

Methods: 1. Follow up of 40 patients who had cervical cerclage in the institute.
2. The end points were onset and off set of sensory and motor blockade, time for maximum sensory block, time for first voiding, time to borage score 0 and side effects.

Results: All data were analysed using MS excel spreadsheet.

Table 1. Demographic Data

<table>
<thead>
<tr>
<th>Variable</th>
<th>Prilocaine group</th>
<th>Bupivacaine group</th>
</tr>
</thead>
<tbody>
<tr>
<td>n</td>
<td>20</td>
<td>19</td>
</tr>
<tr>
<td>Age (yr)</td>
<td>32(22-41)</td>
<td>33(22-46)</td>
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<tr>
<td>Gestational age (wk)</td>
<td>14(13-23)</td>
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<td>BMI</td>
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<tr>
<td>Para</td>
<td>1(0-3)</td>
<td>1(0-2)</td>
</tr>
</tbody>
</table>

Results are outlined in Table 2.

Conclusions: Prilocaine has been extensively used for various ambulatory procedures as the first choice LA for SAB. Prilocaine has pharmacological advantage of fast onset and off-set.

Central Nerve Blocks

ESRA7-0303

CO-RELATION BETWEEN USG MEASURED EPIDURAL DEPTH WITH ACTUAL DEPTH AND BMI (TRI-VARIATE ANALYSIS)

Mohanraj A, Kuppuswamy, Wrigthington- Wigan and Leigh NHS foundation trust, Anaesthesia, Wigan, United Kingdom.

Background and Aims: Correlation between USG measured and actual depth and BMI.

Methods: 94 patients undergoing gynaecological procedures were recruited and study done with the supervision of professor from radiology.

Results:

Problem 1: Correlation between the measured depth (with the ultrasound) and the actual depth (with the needle) together with BMI.

Correlations

Also all the correlations are statistically significant at 95% level of confidence with reported p value < 0.0001.

Problem 2: Does BMI affect the needling?

A procedure of Mediation analysis has been attempted which explains the causal relationship between two measuring methods that is being influenced by BMI (Figure 2).

DIRECT AND TOTAL EFFECTS

Coeff s.e. t Sig t(2)
c .6008 .0830 7.2395 .0000
a 3.2417 .4793 6.7634 .0000
b .0321 .0213 1.5085 .1363
c’ .4968 .1073 4.6309 .0000

INDIRECT EFFECT (ab) AND SIGNIFICANCE USING NORMAL DISTRIBUTION

Value s.e. LL95CI UL95CI Z Sig t(2)
.0008 .0830 7.2395 .0000
3.2417 .4793 6.7634 .0000
.0321 .0213 1.5085 .1363
.4968 .1073 4.6309 .0000

NUMBER OF BOOTSTRAP RESAMPLES : 1000

FIGURE 2.

A scatter matrix between three variables can be identified by Scatter Matrix between USG, BMI, and Nee_Dep.

FIGURE 1.
Conclusions: There is statistical significance (p value < 0.001) of total effect with positive direction (0.6008). Though the effect size of BMI is of same direction (0.1040) it is not statistically significant as can be observed from the p-value > 0.05 (0.1450).

Central Nerve Blocks
ESRA7-0077

SEQUENTIAL FAILED OBSTETRIC EPIDURAL TOP-UP AND SPINAL ANAESTHESIA IN A PARTURIENT UNDERGOING EMERGENCY CAESAREAN SECTION
Lee S.T., and Loh L.1, 2 JKK Women's and Children's Hospital, Anaesthesiology, Singapore, Singapore, 2KK Women's and Children's Hospital, Women's Anaesthesiology, Singapore, Singapore.

Background and Aims: Spinal anaesthesia following a failed epidural top-up technique is considered an acceptable alternative in a parturient undergoing caesarean section. While an isolated failure in obstetric epidural top-up or spinal is not uncommon, two consecutive failed regional anaesthetic in the same patient is unusual. In this case report, we present a parturient whose epidural top-up and spinal anaesthetic, performed by experienced hands, both failed, requiring a general anaesthetic.

Methods: A young, term nulliparous parturient was admitted for induction of labor. A continuous spinal epidural (CSE) was inserted uneventfully. Throughout labour, her contraction pain was well controlled with the epidural infusion. 12 hours later, she was scheduled for a caesarean section for failure to progress, and the choice of anaesthesia was epidural top-up. After 20mls of 2% lignocaine and an interval of 30 minutes, the patient persisted with an inadequate sensory level and no motor block. The epidural catheter was removed and a single shot spinal was performed uneventfully. 4ml of 0.5% heavy bupivacaine was administered.

Results: However, the spinal anaesthetic failed to raise the sensory level or produce any motor blockade. The surgery was eventually performed under GA.

Conclusions: Sequential regional anaesthetic failure in the obstetric setting is uncommon. Possible causes of failure include pseudo-successful lumbar puncture, anatomical abnormalities and loss of injectate. This case has unmasked the limitation of CSF flow as a sole clinical confirmation of intrathecal needle placement. There may be a role for other bedside confirmatory tests, such as CSF glycemic testing, especially in the context of a failed epidural top-up.

Central Nerve Blocks
ESRA7-0092

MENINGITIS IN A PATIENT WITH EPIDURAL CATHETER FOR POSTOPERATIVE ANALGESIA RESULTED FROM SURGICAL WOUND INFECTION. THIS NECESSITATES UNDERSTANDING OF COMPLICATIONS OF CENTRAL NEUROAXIAL BLOCKS
Obeid M. King Hussein Cancer centre, anaesthetics, Amman, Jordan.

Background and Aims: This is a 36 year old male patient known of locally advanced rectal cancer admitted for lower anterior resection (LAR) and right ileostomy. Epidural catheter was inserted under complete aseptic techniques with no problems.

General anaesthesia was administered and the surgery and anaesthesia both were straightforward with no complications.

On the 4th postoperative day the patient started to deteriorate with surgical stoma looking dusky and oedematous.

On day 7 of the operation a positive blood culture for pseudomonas aeruginosa was isolated from blood. The patient was diagnosed of having meningitis as the same organism was also isolated from CSF.

Results: Meningitis is a rare complication of CNB and the incidence is estimated of less than 1 in 200,000 from NAP3. In this patient the source of meningitis was primarily due to surgical wound infection.

However, prompt treatment in this patient has made full recovery.

Conclusions: Central neuroaxial blocks have many benefits. Epidural analgesia markedly reduces complication rates However, meningitis may occur and presentation may be atypical and it may be difficult initially to differentiate from a post dural puncture headache. The causative organism can give indication on source of infection.

Suspicion of infective meningitis should prompt early diagnostic lumbar puncture and full laboratory examination of CSF.

In patients with systemic sepsis it has been recommended that antibiotics should be administered before performing CNB.

Central Nerve Blocks
ESRA7-0236

UTILITY OF A SKIN SURFACE TEMPERATURE PROBE AS A PRACTICAL METHOD TO EARLY DETECT EPIDURAL ONSET: A PRELIMINARY REPORT
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Background and Aims: Confirmation of correct epidural catheterization in the quick-turnover operating setting is often omitted due to slow onset of sensori-motor block and necessity of complicated facilities to check sympathectomy.

Methods: With IRB approval, epidural catheterization was performed by the same third-year resident via L-5 interspace using a 18G Tuohy needle (Portex Set with 1.2 mL dead space). Patients were kept in left decubitus position waiting for the readings of skin probes (Ts), either from the plantar side of bilateral great toes or from forehead reference, to stabilize. Epidural solution comprised 17 mL of 2% lidocaine, 2 mL ofalfentanil, 2.3 mL of 7% sodium bicarbonate, and 0.1 mg epinephrine. Skin temperature was recorded every min for 10 min following injection. Gross temperature measurements (Ti) distal to the knee of the independent leg was performed using infrared thermography. Data are presented as means (SD) and compared with Student’s t-test.

Results: Fifteen patients scheduled for hemorrhoidectomy or fistulotomy were enrolled. Time to reach 0.3°C and 0.5°C Ts change in the dependent leg was 3.36 (2.02) and 4.43 (2.24) min, which are not significantly different from the independent leg regardless of adjustment to the reference Ts.
Central Nerve Blocks

ESRA7-0010

EPIDURAL-INTRADURAL HEMATOMA AFTER EPIDURAL-INTRADURAL ANESTHESIA

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Background and Aims: Spinal hematoma is known to be very rare which is usually associated with hemorrhagic disorders, trauma, and iatrogenic causes. Our aim is to describe symptoms of epidural and intradural thoracic hematoma.

Methods: A 80th female patient was scheduled to femur replacement under epidural-intradural anaesthesia. The patient was placed in a sitting position. Epidural-intradural anaesthesia was attempted at L3-L4 intervertebral level via midline approach using a Touhy 18 G needle and Whitacre 27G spinal needle, without difficulties. After aspiration of cerebrospinal fluid, Isobaric 0.5% bupivacaine (15mg) was injected. The surgery lasted 180 min without any problems. Four days after epidural catheter removal, she complained about acute lower back pain radiating to injured leg. It was associated to sensory and motor bilateral block to T10 level. A MRI revealed a subarachnoid hematoma at L1-L5 level and canal stenosis at T10-L5 level.

Results: Surgical evacuation was successfully but the postoperative course was uneventful. One month after operation, she suffer from paralysis bilateral legs, lower back pain and urinary disturbance.

Conclusions: Spinal and epidural anaesthetic procedures represent the tenth most common (the 1th when it was associated with anticoagulation therapy) cause of spinal haematoma. Other risk factors are: spinal stenosis, paramedial puncture, number of punctures, multiple degenerative dyscoathy, needle size, elderly patient, and renal failure. Spinal hematoma should be suspected as the differential diagnosis of gait disturbance in patients under spinal anesthesia. Early diagnosis and identification of the extent of the hematoma is necessary for successful treatment in six hours late.

Central Nerve Blocks

ESRA7-0156

PATIENT LED IDENTIFICATION OF THE MID-LINE OF THE LUMBAR SPINE COMPARED WITH ULTRASOUND IMAGING IN MORBIDLY OBESE PATIENTS AND THE IMPACT OF ANXIETY

Shah T, Dhansura T, and Tarawade U. Saifee Hospital, Anaesthesia, Mumbai, India.

Background and Aims: Identification of the mid-line for central neuraxial blocks by palpatory methods in morbidly obese patients is near impossible. The study is aimed at identifying the impact of anxiety on self awareness of one’s body in morbidly obese patients with BMI more than 45.

Methods: Patients who were admitted for incidental surgery, were randomly allocated to two different groups and asked to identify the mid-line of their lumbar spine. The same finding was confirmed using ultrasound imaging of the lumbar spine and the deviation from the actual location was noted.

Patients were randomly allocated in two groups. Group A, the procedure was done in the preoperative period (prior to the day of surgery) and in the other group B in the immediate preoperative period (in the preoperative area in operating theatre).

In both the groups we assessed their Beck Anxiety Inventory score to evaluate if anxiety caused a difference in the patient ability to identify the mid-line.

Results: 57.69% out of 26 obese patients were able to identify the mid-line of their back accurately within 5 mm and 100% within 10 mm range. Only 1 patient out of 26 (3.8%) had moderate anxiety and as per the unpaired T test, P value is 0.873 and the difference is not significant.

Conclusions: In conclusion, the results show that anxiety is not a confounding factor and morbidly obese patients can identify the mid-line of their back correctly.

Central Nerve Blocks

ESRA7-0389

AWAKE LAPAROSCOPIC SLEEVE GASTRECTOMY UNDER THORACIC EPIDURAL ANESTHESIA: A CLINICAL FEASIBILITY STUDY

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Background and Aims: Bariatric laparoscopic surgery with pneumoperitoneum is commonly performed under general anesthesia; which may increases upper airway collapse risk, pulmonary atelectasis, and postoperative pulmonary complications in this population. With improved surgical techniques and shorter pneumoperitoneum, regional anesthesia may be considered to be a promising alternative to general anesthesia in selected cases. This study evaluate the safety and feasibility of awake laparoscopic sleeve gastrectomy under local thoracic epidural anesthesia.

Methods: After obtaining approval from the institutional medical ethics committee, and written informed consent for each patient, 15 ASA class 11 or 111 patients were allocated to the study. All patients underwent laparoscopic sleeve gastrectomy under sole thoracic epidural anesthesia.

Results: Laparoscopic sleeve gastrectomy was performed successfully under thoracic epidural anesthesia, with the exception of one patient who required conversion to general anesthesia due to increased respiratory rate, creating difficulty in performing the procedure.

Conclusions: From the implemented research it was concluded that awake laparoscopic sleeve gastrectomy under sole thoracic epidural anesthesia seems to be safely feasible, with minimal hemodynamic consequences and excellent patient, and surgeon satisfaction. Such innovation with excellent patient acceptance and lowest cost for our institution may lead to a new standard for ambulatory bariatric surgery and play future role for protocols in bariatric surgery. Further controlled studies is recommended to evaluate efficacy and safety of this technique in high risk surgical patients.

Central Nerve Blocks

ESRA7-0406

SHOULD THORACIC EPIDURALS BE USED AS A GOLD STANDARD FOR MANAGEMENT OF MAJOR CHEST TRAUMA AT A TERTIARY TRAUMA CENTRE IN LONDON?

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Background and Aims: In Europe, chest trauma contributes to 10% of all trauma related deaths and pain may be difficult to manage in survivors.

Studies have shown that thoracic epidural (TE) analgesia may prevent morbidity secondary to hypoventilation associated with pain.

We aim to show that a standard operating procedure and protocol guided caring is needed to manage major chest trauma.

Methods: Retrospective study into the use of thoracic epidurals in chest trauma.

TARN – Trauma Audit Research Network searched over a 6-month period: 1st January to 1st July 2015.

147 patients had associated chest trauma suitable for study.
Results: The pain team was involved in the management of all 19 patients who received Epidurals.

8 epidurals were sited as a primary mode of analgesia and 11 secondarily as PCA analgesia had failed.

There were 17 cases where analgesia was inadequate, but 6 patients were suitable for thoracic epidural.

There were 17 patients who developed respiratory failure and had no significant past medical history.

Patients who were considered unfit for epidurals due to anticoagulation developed respiratory failure.

Conclusions: Non-epidural analgesic failure corresponded to advancing age, increasing number of rib fractures and bilateral involvement.

We make the argument that by providing early thoracic epidural analgesia the trade-off between analgesia and narcosis is minimized.

The need for analgesia in anticoagulation patients should not be undermined and other options explored.

We proposed a new guideline for the management of patients at high risk of analgesic and respiratory failure even when thoracic epidural is contraindicated, by using other regional anaesthetic techniques like serratus plane blocks.

Central Nerve Blocks

ESRA7-0297

EXPERIENCE OF EPIDURAL BLOOD PATCH IN POSTDURAL HEADACHE

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Background and Aims: Post-dural puncture headache (PDPH) is an important iatrogenic cause of patient morbidity in modern anesthesia, pain management after attempted epidural blocks and after spinal taps. PDPH is reported as 76-85 % of patients following neuroaxial blockade. Despite several precautions taken for decreasing incidence; it is inevitable especially in young female patients. Conservative treatment consists routine bed rest and aggressive hydration, NSAID analgesics and caffeine. In resistant cases epidural blood patch (EBP) is the option of therapy. Twelve cases whom EBP were applied in one year period in the Pain Clinic and success rate reported here.

Methods: EBP is performed in the treatment of 12 cases with PDPH under the standardized ASA monitoring and with the presence of anesthesiologist. EBP performed by pain specialist or by senior anesthesiology residents.

Results: Eight of the patients were female and 4 were male and their mean age was 31 years (20-41 years). Four of the female patients had C-section under spinal anesthesia. Conservative treatment was undertaken at least 2 days after attempted epidural or spinal anesthesia in all patients and patients were admitted to Pain Clinic at 3.2 days (one case after 27 days not included). One patient had unsuccessful sphenopalatine ganglion blockage prior to EBP. Patients reported their VAS scores mean of 9.5 prior to procedure. All cases reported 50-100% relief in pain after the blood patch and were very highly satisfied with the procedure.

Conclusions: In this limited series of patients it is proven that EBP in PDPH is very successful invasive treatment modality.

Central Nerve Blocks

ESRA7-0177

“SHADOW BOARD” USE IN SPINAL ANAESTHESIA PREPARATION

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Background and Aims: The spinal anaesthesia preparation and applicaton time was very successful invasive treatment modality.

The spinal anaesthesia preparation and applicaton time was very successful invasive treatment modality.

We propose a new guideline for the management of patients at high risk of analgesic and respiratory failure even when thoracic epidural is contraindicated, by using other regional anaesthetic techniques like serratus plane blocks.

Chronic Pain Management

ESRA7-0153

PROLOTHERAPY ON COCCIX FRACTURE

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Background and Aims: Prolotherapy is an injection technique. The joint periphery and joint capsule, which are difficult to reach with the injector needle, can be reached by deep ligament construction. Prolotherapy can interfere with shoulder, knee, ankle, hip joints. It is intended for injection into the start and end points of ligaments and muscles tendons. Static stabilizers of joints are ligaments. Functional and anatomic deficiencies of the ligaments contribute to the development of arthrosis.

The places where the ligaments stick to the bone are called enthesis. The stimuli and hypertonic solutions given to the instabilized ligament enthesis sites initiate the remedial recovery process. There are collagen synthesis with repair mechanisms. Tissue healing is expected in about 3 weeks.

Methods: 38 years old female patient. In her history 3 years ago fell from the tree. Radiographically detected cocxix fracture in the graph. Neurosurgery has suggested surgery. Pain and insomnia are present. To lumbar region Prolotherapy was applied with 15% dextrose. The blood was increased by heating the region with infrared 20 mm.

Results: The pain resolved after the patient's prolotherapy session.xavx.0.

Conclusions: In study Khan et al. The authors reported injecting 8 ml of 25% dextrose and 2 ml of 1% lignocaine (lidocaine) over the most tender spot of the coccyx, using an image intensifier to locate the sacroccocygeal joint.

Chronic Pain Management

ESRA7-0034

PROTHRATHERAPY IN ROTATOR CUFF TENDINITIS

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Background and Aims: Prolotherapy is a form of treatment with the injection of proliferating solutions to strengthen and restore the weakened old disfunctioned joints, cartilages ligaments and tendons. In cases where post-traumatic tendon and ligament problems can not be healed by inadequate tissue repair and chronic pain, prolotherapy is the most successful case. Post-traumatic tissue may cause adverse effects on healing because of the lack of blood supply due to injured vessels.
Injection of irritant solutions stimulates fibroblasts to promote or reinvigorate healing.

Methods: 55 years old male, weight 90kg, size 1.80m. he has got shoulder pain for 3 months. He is active tennis player, and sports injuries. In his physical examination painful shoulder movies. Proliferation was performed the supra-spinatus muscle tendon under a total of 20cc around acromion with 23 G needle and 13 mm needle. The patient's arm was kept in the pelvic and was adducted in the internal rotation. Patient 20 minutes infrared heating treatment.

Results: It is stated that in some patients dextrose proloterapine may be added to the standard shoulder rotator cuff pain.

Conclusions: Hackett cared for healing at the site of fibroosseous adhesion, which was resolved as a fibroosseous adhesion proliferation of the tendon or ligament adhering to the bone. Lee DH et al. suggested that Prolotreapy V AS score, SP ADI score, isometric tensile strength (abductor) n shoulder AROM treatment group. They have interpreted prolotherapy as an effective treatment method, even if they are indirect with the results obtained.

Chronic Pain Management

ESRA7-0033

OZONE TREATMENT RESULTS OF ROMATOID ARTHRITIS NEUROPATHIC PAIN

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Background and aims: The most important effect of ozone therapy is to regulate blood circulation. Ozone itself is free radical. Since it is an unstubilized molecule, it interacts with other molecules or molecules in a short time and becomes more stable oxygen and ozonoid molecules. It interacts with the cell membrane and has anti-microbial and anti-tumoral effect.

Methods: 55 years old female, weight 61 kg., size 1.65m. she has got Rheumatoid arthritis, in her physical examination Heberden nodules, neuropathic pain. In her left leg EMG; message loss. She used Pregabalin, methotrexate, plaqunil. VAS 8. She left pregabalin made dizziness. Ozone therapy was applied for 4 sessions from 15 gamma to 35 gammas. In 3rd session VAS was 0. 3 years ozone therapy continues painlessness. Is not using drugs other than ozone treatment.

Results: After ozone administration, endorphin release is increased, thalarnus and cortex are painful stimuli are blocked. The inhibition due to oxidative de-generation of the algesic system results in the activation of algesic sitemen.

Conclusions: Siensmen in 1995 stated that the application of medical ozone joints in acute chronic pain diseases is a complementary treatment of pain, rapid pain relief, elimination of edemas, decrease of local heat and increase of mobility.

When the ozone has an active-stimulating effect in the low dose administration, the moderate dose application has a modercutive effect, while the superaseps-inhibiting effect has a high dose. Dose philosophy is to start slowly with a low dose and to increase slowly.

Chronic Pain Management

ESRA7-0278

GABAPENTIN, PREGABALIN IS THERE A REAL PROBLEM?

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Background and aims: Gabapentinoids are commonly prescribed to treat chronic neuropathic pain. There is increasing concern about its misuse and aberrant behaviour associated with treatment. We assessed this problem in our Chronic Pain Clinic by asking patients to fill in the Current Opioid Misuse Measure (COMM) questionnaire. Potential substance misuse, length of treatment, dose, pain diagnosis, symptoms improvement, side effects and attempt on reducing dose were analyzed. The data was collected over one month.

Results: 52 patients filled in correctly the questionnaire. 12 were excluded from the evaluation as were taking regular opioids. Patients were divided into Gabapentin (n= 21) and Pregabalin (n=19) subgroups. In 62.5% treatment was initiated in the primary care. 45% reported only slight pain reduction and 25% no improvement. More than 50% were complaining of mood change. 62.5% of patients did not attempt drug reduction irrespective of side effects or efficacy. COMM results was similar in both groups where 57% of patients scored >9. That indicates abuse or misuse of medication, exhibiting medication-related problems, with mean score of 20 (SD±10.68).

Conclusions: Gabapentinoids possess a potential risk of substance misuse. Patient should be carefully monitored and educated about side effects and risks. The COMM questionnaire is an easy tool to aid establish aberrant behaviour but its results must be confirmed with clinical findings using prescription abuse DSM-IV criteria. Where appropriate attempt should be made to reduce or stop medication.

Chronic Pain Management

ESRA7-0279

INTRATHecal MORPHINE INFUSION THERAPy IN MANAGEMENT OF CHRONIC NON-CANCER PAIN: AFTER JULY 2014 IN KOREA


Background and aims: Intrathecal drug pump is an effective modality in managing chronic non-cancer pain and Korean new reimbursement about intrathecal drug pump in July 2014 has been announced. We analyzed what has been changed in chronic non-malignant pain management after the new policy.

Methods: A retrospective chart review of 23 patients who underwent intrathecal morphine pump (ITMP) implantation in the period of July 2014 and May 2016 was performed. Changes in morphine dose, numeric rating scale (NRS) scores, patients’ overall satisfaction and financial break-even point were investigated.

Results: Nineteen patients were included in this investigation and all patients showed adequate NRS score reduction after ITMP implantation. There was no fe- tal complication with relatively low intrathecal morphine dose. Most patients showed opioid dose escalation and 63% patients needed adjuvant medication after ITMP implantation. 63% of patients satisfied with ITMP treatment and the financial break-even point met at 36.8–52.6 months.

Conclusions: The patients in this investigation achieved effective chronic non-malignant pain management with less systemic side-effect and reasonable cost-effectiveness in long-term use with intrathecal morphine pump therapy. New reimbursement policy has contributed to lower the economic barrier of ITMP from chronic pain patients and improved quality of chronic non-cancer pain patients’ life.

Chronic Pain Management

ESRA7-0340

THE PROCO RANDOMIZED CONTROLLED TRIAL: EVALUATION OF STIMULATION PULSE RATE ON CLINICAL OUTCOMES IN PATIENTS WHOSE PAIN IS CONTROLLED BY KILOHERTZ SPINAL CORD STIMULATION

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Background and aims: PROCO was a double-blind, randomized, crossover study that investigated effects of spinal cord stimulation (SCS) frequency (1–10 kHz) on analgesia.
Methods: 31 SCS patients (low back pain ≥ 5; low back pain ≥ leg pain) underwent an 8–10 week search to identify the best location ("sweet spot") of stimulation at 10 kHz within the searched area (primarily the T9/T10 vertebral region). The 21 responders to 10 kHz proceeded to rate randomization. Rates from 1–10 kHz were assigned in random order and used for 4–6 weeks each while stimulating at the same sweet spot identified during the search. Pulse width and amplitude of stimulation were adjusted to optimize therapy for each rate.

Results: Pending analysis.

Conclusions: Pending analysis.

Chronic Pain Management

ESRA7-0164

A CASE REPORT OF PERIPHERAL TRIGEMINAL NEUROPATHY

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Background and Aims: Neuropathic pain has been recently redefined as "pain arising as a direct consequence of any lesion or disease affecting the somatosensory system".

Methods: Female, aged 45 yrs. Six years previously she had developed continuous pain and felt the generalized gingival swelling in the region of the left lower molar area. Lower premolar (#35) was done root canal therapy (RCT) in local clinic. However, all her symptoms remained unchanged. So, she did RCT on #35, again. Pain and residual discomfort persisted. Lower molar (#36) was done RCT in local clinic. Also pain did not gone, re- RCT on #36 was done, and this pain did not recur. After 5 years she developed continuous pain and discomfort in the region of the left lower molar area, again. 1 year later, both lower premolar and molar teeth (#35, 36) were extracted under local anesthesia. All her symptoms remained and even were severe.

Results: Tentative diagnosis was peripheral trigeminal neuropathy. Patient was treated with medication including maxnophen (acetaminophen 0.325g, tramadol hydrochloride 37.5mg), mucosta (rebamipide 0.1g), neurontin (gabapentin 0.3g) tid for 15 days. After 2 weeks, this pain was relieved.

FIGURE 1.

FIGURE 2.

Diagnostic anesthesia

Before anesthesia
After topical anesthesia
After infiltration anesthesia
After block anesthesia

0 2 4 6 8 10 (VAS)

Chronic Pain Management

ESRA7-0243

THE SIBERIAN EXPERIENCE OF SPINAL CORD STIMULATION FOR REFRACTORY ANGINA PECTORIS


Background and Aims: Refractory angina pectoris (RAP) is a chronic pain conditions caused by coronary artery diseases, which cannot be adequately controlled neither by combination of medical therapy nor by vascular surgery treatment (angioplasty or CABG). Spinal cord stimulation (SCS) is a neuro-modulation therapy that appears to be an effective and safe treatment for these patients.

Methods: We had applied SCS in 17 patients with RAP. The first step procedure was trial neurostimulation to reveal the efficacy of pain relief before the second step to implant the permanent SCS. Myocardium perfusion scintigraphy (MPS) was performed on admission, on the 7th day and in 1 year after procedure. The visual analogue scale (VAS) was used to assess the degree of pain both in rest and physical activity in all patients.

Results: The patients showed 8,49±0,14 marks according VAS before the procedure and pain relief to 1,25±0,73 marks (p<0,01) after 1 year of procedure. All the patients demonstrated the rise of tolerance to the physical activity. MPS detected the decrement of perfusion's defect from 13,36±4,16 to 10,14±3,53 prearranged units (which means increase in coronary reserve up to 24%). The quality of life according to SAQ increased by 60,29% (TS scale - 58,12% amount of growth and PL scale - 64,65%). There were no any procedural complications. But we had registered 1 patient's death from cardiac infarction in one-year catamnesis.

Conclusions: Our experience confirms that SCS is a minimally invasive technique to reduce the pain and improve quality of life with vascular reserve enhancement in RAP patients.

Chronic Pain Management

ESRA7-0396

THE COMPARISON OF CLINICAL OUTCOMES OF PATIENTS TREATED WITH PERCUTANEOUS HYDRODISCECTOMY ON SINGLE/TWO AND MULTIPLE LEVELS

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Background and Aims: A new minimally invasive procedure, percutaneous hydrodiscectomy (PHD), mechanically cuts and removes disc material using a high-velocity, non-thermal saline fluid jet. The purpose of this study is to compare the clinical outcomes of PHD on single/two or three levels in treating patients with radiculopathy secondary to lumbar acute herniated nucleus pulposus (HNP).

Methods: A retrospective review at Trakya University Hospital was conducted on 69 patients with HNP confirmed by MRI, who underwent PHD at one/two levels (Group I) or three levels (Group II). Some parameters were compared between the two groups for 4 weeks: Gender, age, Pain(VAS), walking distance, heart rate duration, MRI findings, complication.

Results: A total of 140 lumbar levels were treated by PHD; 21 single-level, 26 two-level (Group I: Total 73 levels) and 22 three-level (Group II: Total 67 levels). We found significant difference in walking distance after procedure (100-600/100-400 m) (p<0.013), number of procedure levels (2/3) (p<0.01).
and couldn’t find any significant difference in Age (36.5/64), VAS after 4 weeks (8/3, 8/4) (p=0.323, 0.116) between two groups.

Conclusions: PHD single/two levels is a more reliable treatment option with minimal risk of complications than three or more levels for patients with HNP.

Chronic Pain Management
ESRA7-0106

EFFECT OF PROGRAMMED WEIGHT LOSS ON CHRONIC JOINT PAIN IN OSTEOARTHRITIS- NON PHARMACOLOGICAL INTERVENTION
Paul M. University Hospital of North Tees, Anaesthesia, Stockton on Tees, United Kingdom.

Background and Aims: Obesity has been long recognised as risk factor for osteoarthritis. Despite the high volume of publications on the subject, there are still gaps in our understanding of the pathogenesis of OA in the obese patient. This study overviews what is already known about effects of obesity; and chronic joint pain and study the effect of supervised weight loss program through a combined exercise and limited calorie intake and its effects on pain intensity and need for analgesia.

Methods: The aim of the study was to study the effect of 14 pounds programmed weight loss with help of a combined diet and exercise on pain intensity (Visual Analogue Scale) and analgesia usage.

Results: Results analysed at the end of 14 weeks.
• 11 male patients achieved target weight loss of 1 stone (14 pounds) compared to 16 female patients - percentage weight loss 6.67 of mean.
• The mean change in VAS among male patients was from 6/10 to 4/10 and female patients were from 7/10 to 6/10.
• The change in NSAID use for breakthrough pain was reduced from 4 times weekly to 3 times weekly.
• Use of weak opioid (codeine) was reduced in 21 patients.

Conclusions: Targeted oriented programmed weight loss, even by 6.67% significantly improved patient symptoms and reduced use of NSAIDs and opioids, thereby reducing long term and short term side effects of these drugs.

Chronic Pain Management
ESRA7-0381

TRANSFORAMINAL AND CAUDAL BLOCK FOR TREATMENT OF RADICULATIA AND POST-LAMINECTOMY SYNDROME

Background and Aims: International Association for the Study of Pain (IASP), defines post-laminectomy syndrome as “spinal lumbar pain of unknown origin that persists in the same location of original pain despite surgical interventions, or that is installed after surgery. Estimates point to a surgical failure rate in pain relief of more than 40%, with a series of variables associated with poor surgical outcomes.

Methods: Variables associated with poor surgical outcomes. The objective is to present a case of post-laminectomy syndrome refractory to clinical treatment with a positive double-block, caudal and transforaminal response.

Results: Patient TMQ, 26 years old, female, victim of assault for 1 year with projectile of firearm housed in L3. Lumbar spine removal and lumbar spine arthrodesis of L1-L3 were performed. Patient progresses with motor deficit and can’t find any significant difference in Age (36.5/64), VAS after 4 weeks (8/3, 8/4) (p=0.323, 0.116) between two groups.

Conclusions: Thus, correct diagnosis and appropriate therapy are inherent in clinical success.

Chronic Pain Management
ESRA7-0379

GASSER LOCK ASSOCIATED TO THE FRONTAL APPLICATION OF BOTULINAL TOXIN IN A PATIENT WITH PARRY ROMBERG SYNDROME

Background and Aims: The Parry Romberg syndrome usually manifests on only one side of the face, hence the denomination of hemifacial atrophy. It is a common association with trigeminal nerve neuralgia with hypersensitivity in the ophthalmic and maxillary branches generating painful reflexes in the eyes, lips, nose, scalp and frontal region.

Methods: To demonstrate the efficacy of Gasser blockade associated with the application of botulinum toxin A for the treatment of trigeminal neuralgia and chronic migraine in a patient with Parry Romberg syndrome.

Results: Patient LPS, 54 years old, female, with Parry Romberg syndrome with left hemiface atrophy associated with trigeminal neuralgia, chronic migraine, minor thalassemia and neurotrophic ulcer in ipsilateral eye. It makes use of Carbamazepine 400mg 12/12h, amitriptilina 75mg and tramadol 50mg of 6/6h of rescue. Patient referred to the USP-RP pain service where it was proposed to perform a series of 3 Gasser blocks (lidocaine 40mg + duodecadron 10mg + clonidine 15mg) performed by anatomical reference. Patient reported complete pain improvement with recurrence in 20 days, with maintenance of migraine.

It was associated with the Gasser block to the Botulinum toxin - A in 07 points of the frontal region making a total dose of 200U with repetition every 6 months with success of the technique used. Therefore, the combination therapy of Gasser and Botulinum Toxin blockade.

Conclusions: Is an effective and safe alternative in the treatment of chronic migraine and trigeminal neuralgia in patients with Parry Romberg Syndrome.

Chronic Pain Management
ESRA7-0302

THE SURVEY OF 1-DAY AND 3-DAY-TYPE TRANSDERMAL FENTANYL PATCH FOR CHRONIC NON-CANCER PAIN PATIENTS
Takao Y., Mizobuchi S., Motoyama Y., and Sato H. Kobe University Graduate School of Medicine, Anesthesiology, Kobe, Japan.

Background and Aims: The strong opioid for non-cancer pain is strictly regulated in Japan. Till 2010, we could prescribe only morphine hydrochloride, and from January 2010, transdermal fentanyl patch was allowed to prescribe, and now we can use 1-day-type and 3-day-type fentanyl patch for non-cancer pain patients. In this study, we surveyed the usage conditions of transdermal fentanyl patch for chronic non-cancer pain patients.

Methods: We surveyed retrospectively those non-cancer pain patients who were prescribed fentanyl patch from January 2010 to March 2016 in our hospital. Next, we extracted long term usage (over one year) cases from those patients, and we surveyed the type of fentanyl patch and final dosage.

Results: We prescribed 130 non-cancer patients during that period. And long term usage cases were 30 patients (13 male and 17 female), and average age was 55.7±16.3 yr. The average duration of fentanyl patch application was 26.3±12.4 month (12~65 month). At the introduction of the fentanyl patch, 80% of patients were prescribed 3-day-type fentanyl patch, but at the end of the survey period, 63% were 1-day type and 37% were 3-day type. And we surveyed the final dosage of fentanyl-patch at the end of the survey period, 16 (53%) patients were prescribed 30 MME (morphine milligram equivalents), 11 were 60 MME and 3 patients were over 60 MME. No severe adverse effect was seen.
Conclusions: For non-cancer chronic pain patients, one-day type fentanyl patch has a tendency to be prescribed.

Chronic Pain Management

ESRA7-0248

EPIDURAL BLOOD PATCH PERFORMED IMMEDIATELY AFTER DURAL PUNCTURE AND EPIDURAL DRUG ADMINISTRATION


Background and Aims: The epidural blood patch represents a solution against persistent headache following accidental dural puncture. The purpose of this study is to report three cases where the epidural blood patch was performed immediately after dural puncture, combined with drug administration for lumbargia sciatica.

Methods: The patients (72 years old female, 41 years old male, 55 years old female), attended the Department of Anesthesiology and Pain Treatment of the General Hospital of Rhodes, Greece, for epidural analgesia against lumbargia sciatica. As usual, the patients were informed in detail about the procedure regarding the advantages, eventual complications and possible solutions, formed the consensus, and all common protocols were followed (sterilization, monitoring, iv access).

At the moment of dural puncture, all three patients manifested severe headache, nausea, vomit, and profuse sweating. The needle was extracted and a second epidural puncture was performed at a higher intervertebral space, followed by drug administration and then the injection 20 ml of autologous blood.

Results: All three patients presented gradual improvement of their condition, while the headache vanished completely after 30 to 35 minutes. They were retained in ward for monitoring and were released the following day with specific instructions and under daily phone contact for a week, without manifesting any complications. Furthermore lumbargia symptoms regressed.

Conclusions: Epidural blood patch executed immediately after dural puncture, seems to relieve post dural puncture headache fast, and could be combined with epidural drug administration. That way the patient does not lose the analgesia session, and is relieved from eventual discomfort.

Chronic Pain Management

ESRA7-0437

TRACKING FACIAL PAIN: TRIGEMINAL NEURALGIA DUE TO AN UNRESECTABLE TUMOR

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Background and Aims: Facial pain is a serious and devastating condition, especially, in patients with inoperable cranial tumours. Although no customized pain treatment strategy is available, main consideration should be an individualized approach including ganglion and branch-targeted trigeminal blocks to support and decrease medical therapeutics. Here, we report the first 14-months follow-up of a patient with intractable facial pain due to trigeminal nerve tumour filling Meckel cave.

Methods: A 53-years old female patient was referred to pain clinic by neurosurgery department following Gamma knife surgery. She was on carbamazepine, duloxetine, pregabalin, tramadol, amitriptyline therapy, however her pain resisted by a NRS score of 9-10 with paroxysmal, throbbing stabbing electric- like episodes at the left side of her face; severely at the V2-V3 sites and occasionally V1 site. She didn’t open her mouth to avoid triggering movements. The patient visited the pain clinic 12 times in 14-months. We performed sphenopalatine ganglion block with lidocaine 5% three times, supraorbital, infraorbital, supraorbital- infraorbital, infraorbital, larynxotomy, and atacaminolone 1 mg/ml and temporal trigger point injections several times according to relevant pain-nerve site.

Results: The visit intervals decreased to 60 days after 6 months. The patient’s therapeutics are now limited to carbamazepine and occasional use of lamotrigine and tramadol for pain episodes, she has sufficient mouth opening without triggering pain.

Conclusions: We suggest that carefully mapping and tracking facial pain and performing appropriate nerve blocks provide long-term painless and high-quality life in patients who will live with their tumours.

Chronic Pain Management

ESRA7-0046

TREATMENT OF MIGRAINE BY ACUPUNCTURE AND TOPIRAMAT

Zerki L., Raguren Teaching Hospital, Anesthesia, Erbil, Iraq.

Background and Aims: Acupuncture had been used to treat 50 patient suffering from migraine,topiramat (topamax) given to prevent the attacks, duration of treatment is 10 weeks. This medicine will only prevent migraine headaches or reduce the number of attacks. It will not treat a headache that has already begun.

Fifty patients all are male, age 25-35 y, having no systemic disease, complaining of migraine for more than 1Y. Classically the headache is unilateral, throbbing, and moderate to severe in intensity.

Methods: a. I started treating them with acupuncture using the points weekly, for 4 weeks with one tablet per day of topamax.

b. Then 2 weeks rest no acupuncture but the patients continued on topamax tablet 1/day.
c. Acupuncture using same acupuncture for another 4 w, one set/w,with 1 tab of topiramate/every other day.

The patient get 8 set of acupuncture with 60 tablet during 10 weeks of treatment.

Results: All the 50 patients were followed for one year. During this time there was direct contact with them monthly.

After 6 months, all were free of pain except 5 patients (10%). After 1 year, 35 patients was free of pain –and only 10 patient complain of pain.
Conclusions: Acupuncture is effective in treating migraine specially when had been used in combination with Topamax, it has synergistic effect, safe without complications. They cover the acute attacks and had preventing effect.

Miscellaneous

ESRA7-0216

SURVEY OF SURGEON’S ATTITUDES AND KNOWLEDGE REGARDING REGIONAL ANAESTHESIA
Loganathan S., Yan Wong P., Bajaj S., Wong T.M., and Rajaratnam V.

Background and Aims: Surgeon preference is an important factor influencing patient anesthetic choice. Although much has been written regarding patient preferences, very little information is available that examines surgeons’ attitudes towards general anesthesia versus regional anesthesia (RA).

Our study aims to explore the surgeon’s preference to regional anesthesia and other barriers to the practice of evidence based approach to regional anesthesia.

Methods: After DSRB approval, a survey encompasses X number of multiple choice question filled by consented participants on the ‘Google doc’ based web survey without personal identifiers. Information is securely stored through a password enabled data collection.

Data collected will be quantitatively analysed using SPSS and the narrative will be qualitatively analyzed using NVIVO software for themes and patterns in the surgeons’ preferences.

Results: A total of 89 response were obtained (100 %). The population characteristics showed most of them had RA knowledge from clinical work (56.7%). The majority of the respondents agreed that RA is safer, provides better pain control & decreases the complications.

Finally when the participants were asked to choose from RA/GA, only about 24% choose only RA.

Conclusions: The choice of an anaesthetic technique is a collective decision with all the stakeholders embracing the best approach for superior team dynamics with the patient interests in the forefront.

As the patients are primed to the anaesthetic choice during the early visits to the primary surgeons, mutual knowledge sharing of the technicalities and advantages of the anaesthetic techniques and addressing the surgeons’ concerns might help in the selection of the best anaesthetic technique.

Miscellaneous

ESRA7-0011

ACTIVATION OF THE PERIGENUAL ACC AND ORBITOFRONTAL CORTEX REPRESENTING PAIN-RELATED UNPLEASANTNESS LED TO HIGHER PAIN RATINGS IN INDIVIDUALS WITH LOW COMPARED TO HIGH TESTOSTERONE LEVELS
Choi J.C., Park Y.H., Park S.K., Lee J.S., and Lee J.M.
Yonsei University Wonju College of Medicine, Department of Anesthesiology and Pain Medicine, Wonju, Republic of Korea, 2Hanyang University, Department of Biomedical Engineering, Seoul, Republic of Korea, 3Yonsei Damaa Pain Clinic, Yonsei Damaa Pain Clinic, Seoul, Republic of Korea.

Background and Aims: Men with low levels of testosterone tend to be more anxious and irritable than men with normal testosterone levels. This study investigated whether activation of brain regions that represent pain intensity (primary somatosensory cortex (S1)) and pain-related unpleasantness (perigenual anterior cingulate cortex (pACC) and orbitofrontal cortex (OFC)) were affected by blood testosterone levels.

Methods: Local Ethics Committee approval was obtained. Twenty-six healthy men were recruited. Before fMRI scanning, Blood testosterone levels were measured. The participants were classified into two groups (high vs. low testosterone) according to their blood testosterone level (each group n = 13). To induce identical noxious stimulation in all participants, the middle finger was immersed in a 50°C water bath (50°C, 30 s, five times).

Results: Pain, unpleasantness, anxiety, and fear ratings were statistically significantly higher in the low testosterone group compared to the high testosterone group. Fear rating increased as pain rating rose and as testosterone level decreased. During noxious stimulation, the pACC and OFC were statistically significantly more highly activated in the low testosterone group compared to the high testosterone group. Activation of S1, a brain region that represents pain intensity, did not differ between groups.

Conclusions: Activation of the perigenual ACC and orbitofrontal cortex representing pain-related unpleasantness led to higher pain ratings in individuals with low compared to high testosterone levels. These findings indicate that the effects of testosterone level should be considered when treating patients and also suggest that acute clinical pain may be relieved by managing and controlling testosterone levels.

Miscellaneous

ESRA7-0339

A CASE REPORT OF PERIOPERATIVE CORONARY STENT THROMBOSIS: DOES REGIONAL ANESTHESIA IMPROVE OUTCOMES?
Faisco A., Ribeiro J.1, Reis E.1, Amaro S.1, Estevens T.1, and Miranda A.2
1Hospital Professor Doutor Fernando Fonseca, Anesthesiology, Amadora, Portugal, 2Hospital dos Lusíadas, Anesthesiology, Lisboa, Portugal.

Background and Aims: Patients with recent coronary artery stent placement undergoing noncardiac surgery represent a major challenge for anesthesiologists. For the recommended period of 6 to 12 months following drug-eluting stent (DES) placement, they are treated with dual antiplatelet therapy (aspirin and clopidogrel) and require bridge therapy in the perioperative period. Stent thrombosis (ST) is an unusual complication with catastrophic outcomes.

Methods: We report a case of ST in the postoperative period after fixation of intercostoangular fracture with a DHS in a 75-year-old patient, history of hypertension and hyperhomocysteinemia under warfarin, who received a DES 5 months before. The patient has discontinued clopidogrel 3 months before and was bridged with low molecular weight heparin (LMWH) and aspirin for 5 days prior to surgery. The surgery was performed under spinal anesthesia.

Results: On arrival in the post care anesthesia unit, the patient presented with precordial chest pain followed by ST elevation in V2-V5 leads. The patient was immediately transported to hemodynamic unit where full thrombosis of the DES was confirmed and new coronary angioplasty performed with success.

Conclusions: Coronary stent thrombosis almost always present with acute myocardial infarction with ST elevation (STEMI) or death. Early discontinuation of dual antiplatelet therapy, time elapsed after stent placement and the pro-inflammatory and pro-thrombotic state induced by surgery itself are significant risk factors.

Neuroaxial anesthesia attenuates the pro-thrombotic state and allows early detection of signs of ischemia which may be protective. We intend to highlight how early detection of STEMI and proximity to a hemodynamic unit helps to improve outcomes.

Miscellaneous

ESRA7-0250

WHY DO PATIENTS SAY NO TO REGIONAL ANAESTHESIA?
Lavado J., Gonçalves D., Gonçalves L., Fonseca R., Sendino C., and Valente E.
Hospital dos Lusíadas, Anesthesiology, Lisboa, Portugal.

Background and Aims: Regional anaesthesia (RA) gain popularity due to its numerous benefits and increasing safety. However, patients often refuse this procedure. This study aimed to identify factors related to patients’ preference towards general anaesthesia (GA) and RA refusal.

Methods: Participants were aged 18 years or older, proposed to surgery and sent to anaesthesia appointment. Data was collected using a self-completed questionnaire before anaesthesia appointment.
One hundred two patients agreed to participate. Mean age was 53.0 ±14.2 years, 57.8% were female. 91.2% had been anesthetized before. 59.8% had already experienced GA, 37.3% neuroaxial anesthesia and 4.9% nerve blocks.

Given the choice, 55.2% would prefer GA over RA while 20.7% said they would refuse RA if the anaesthetist proposed it.

Age, gender and education were not related to patients’ GA preference or RA acceptance nor was higher anxiety level towards anesthesia. However, when asked specifically regarding anxiety associated to being awake during surgery more anxiety was related to GA preference (p<0.001) and RA refusal if proposed by the anaesthetist (p=0.001).

Patients were asked to rate their level of fear towards eight variables related to RA. More apprehension towards needle puncture was related to RA. More apprehension towards needle puncture varied with age, which were recorded for analysis.

Results: Factors related to patients not wanting RA appear to be manageable with sedation during surgery and amniolytic conversation about needle puncture and risks of back pain. Acknowledging patients’ fears is critical and can help anaesthetists to meet their patients’ needs.

CONCLUSIONS: To increase the visibility of needle during ultrasound-guided nerve block, several new echogenic needle and ultrasound technology have been developed. The aim of this study was to compare the visibility of echogenic and non-echogenic needles with a curved array transducer.

Methods: An experienced anesthesiologist inserted Echogenic (Sonoplex, 22 gauge, PAJUNK) and non-echogenic (Uniplex, 22 gauge, PAJUNK) needles into the pork phantom at angles of 30, 40, 50, 60 and 70-degrees relative to the horizontal plane. A curved array transducer (C-35/8-3 MHz, X–Porte, FUJIFILM Medical) was used. The ultrasound image was set to a depth of 8 cm and the tip of the needle reached the depth of 6 cm in the center of the image, which were recorded for analysis.

Thirty-three independent anesthesiologists scored the images obtained (0= not visible; 10= very good looking tip and shaft visibility).

Pairwise comparisons were evaluated using t-test, and P values are two-sided.

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From January-March 2017, 50 patients admitted with neck of femur fractures were reviewed with respect to the analgesia received during their admission. The median age was 86 years (range 50-103). 39 female and 11 male patients. Fifteen (30%) patients had known pre-existing dementia.

Pre-operative: 27 (54%) patients received Fascia iliaca nerve blocks (FIB) in the Emergency Department (ED) of which 15 were provided by Orthopaedics, 11 by ED. Forty-one (82%) patients received paracetamol and 4 Buprenorphine. Thirty-six (72%) patients received Morphine.

Post-operative: Thirty-nine had General Anaesthetic (GA) plus FIB, 7 had GA alone, 2 spinal alone, 1 GA plus spinal anaesthetic. Local anaesthetic administered for FIB varied with 15-40mls of 0.25-0.5% Bupivacaine (dose 37.5-150mg) given.

Results: The median age was 86 years (range 50-103). 39 female and 11 male patients. Fifteen (30%) patients had known pre-existing dementia.

The analysis of this series shows that claims related to RA practice remain infrequent over the period and occur more in young women with an anxiety-depressive situation. The technical fault is generally not retained. The practice of ultrasound-guided is seldom sought after by the expert. The failure of RA is also a common cause of claims.

ESRA7-0345

COMPLICATIONS AFTER REGIONAL ANAESTHESIA (RA): A CLOSED CLAIMS ANALYSIS (SHAM INSURANCE)

Royade M., Centre Hospitalier Princesse Grace MONACO, Anesthesie Breanimation, MONACO, Monaco.

Background and Aims: The aim of this study was to claim rate related to a complication that occurred after RA.

Methods: We did a retrospective study of the closed claims reported to SHAM insurance over a period of 6 years (2011 to 2016) in France.

Results: 76 cases were reported for this type of complications between 2011 and 2016, involving 58 women (mean 37 years old) and 15 men (mean 60 years old), of which 15% had an anxiety-depressive situation. The complication occurred in a general care hospital (n = 41), an university hospital (21), a private institution (9) or for a health professionals (2). The average time between the facts and the declaration was 6 months and the average opening/closing time was 35 months. 40 cases were settled amicably, 21 by an ICC (Compensation and Commission) and 12 by judicial procedure.

Complications were neurological injury (37), post-lumbar puncture (8), chronic pain (5), bleeding (5), failure of RA (6), psychological disorder (3), cardiac arrest (1), blindness (1), diplia (1), fall (1) neuraxial anaesthesia.

Conclusions: The analysis of this series shows that claims related to RA practice remain infrequent over the period and occur more in young women with an anxiety-depressive situation. The technical fault is generally not retained. The practice of ultrasound-guided is seldom sought after by the expert. The failure of RA is also a common cause of claims.
The three groups shared similar background factors. Recovery time it was determined that fluid replacement calculations we do so. This was an observational, prospective, longitudinal study of Ayala Camargo Y.D.R. Masuda R. ESRA Abstracts 41 0.5 1 24 63.2 51 3 The risk factors identified were; age, surgery type, ASA physical status and intraparative complications (arterial hypotension, intraoperative bleeding, intraoperative hypotension). Delirium is defined as a disturbance in conscious level with reduction to direct attention. Moreover it is related with a change in cognitive function. Objective. To determine the risk factors associated with the development of postoperative delirium in patients older than 65 years. Methods: It was a case control study including 200 patients calculate for sample size, of which 192 patients (case: n=96, control: n=96), under a non-cardiac surgery to evaluate the risk factors related with the development of postoperative delirium from June 2015 to June 2016. Results: No association was found between different anesthesia techniques, not even in surgery and exposure time. The main outcome was death during the first postoperative day or any complications related to anesthesia, surgery, and postoperative period. Other risk factors identified were: ASAIII/IV (p=.000, OR=4.3), emergency surgery (p=.036, OR=2.04), trauma and orthopedic surgery (p=.000, OR=4.7), blood transfusion (p=.044, OR=2.4), and others. Conclusions: Postoperative delirium development is a common complication after surgical procedures mainly in elderly patients. In our study the main risk factors identified were; age, surgery type, ASA physical status and intraoperative complications (arterial hypotension, intraoperative bleeding, intraoperative blood transfusion). It's important to classify people according with the risk factors associated with postoperative delirium to diminish morbidity and mortality.

Results: In 100% of patients lines B were observed in 57.9% (22) 3 or more lines were observed in any quadrant of the anterior chest clinically relevant, in patients who were classified as ASA III 75% present B lines of 3 or more. Conclusions: It was determined that fluid replacement calculations we do so liberal, are exaggerated ultrasound as a noninvasive monitoring in surgical patients will help us guide an adequate replacement.

### TABLE 1.

<table>
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<th>Anesthetic Risk (ASA)</th>
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<th>Percentage</th>
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<tr>
<td>II</td>
<td>20</td>
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<td>10.5</td>
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<td>Total</td>
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### TABLE 2.

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<th>Comorbidities</th>
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<th>Percentage (%)</th>
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</tr>
<tr>
<td>Dyslipidemia</td>
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<td>7.8</td>
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<tr>
<td>Mellitus Diabetes</td>
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<td>7.8</td>
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<td>24</td>
<td>63.2</td>
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<tr>
<td>Total</td>
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</table>

### Miscellaneous

**ESRA7-0051**

**RISK FACTORS ASSOCIATED TO POSTOPERATIVE DELIRIUM IN ELDERLY PATIENTS**


**Background and Aims:** After a surgical procedure, delirium is a common consequence, mainly in elderly patients, and it’s related with anesthesia as a risk factor. Delirium is defined as a disturbance in conscious level with reduction to direct attention. Moreover it is related with a change in cognitive function.

**Objective:** To determine the risk factors associated with the development of postoperative delirium in patients older than 65 years.

**Methods:** It was a case control study including 200 patients calculate for sample size, of which 192 patients (case: n=96, control: n=96), under a non-cardiac surgery to evaluate the risk factors related with the development of postoperative delirium from June 2015 to June 2016.

**Results:** No association was found between different anesthesia techniques, not even in surgery and exposure time. Statistical difference was seen in the variable age, finding a mean of 5 years more in the case group. Other risk factors identified were: ASAIII/IV (p=0.00, OR=4.3), emergency surgery (p=0.036, OR=2.04), trauma and orthopedic surgery (p=0.000, OR=4.7), blood transfusion (p=0.044, OR=2.4), and others.

**Conclusions:** Postoperative delirium development is a common complication after surgical procedures mainly in elderly patients. In our study the main risk factors identified were; age, surgery type, ASA physical status and intraoperative complications (arterial hypotension, intraoperative bleeding, intraoperative blood transfusion). It’s important to classify people according with the risk factors associated with postoperative delirium to diminish morbidity and mortality.

**ESRA7-0029**

**EVALUATION BY PULMONAR ULTRASOUND OF CONVENTIONAL ANESTHETIC FLUID THERAPY ON ELECTIVE NON-CARDIAC SURGERY**


**Background and Aims:** Perioperative fluid therapy is one of the most important tasks of anesthesiologists currently conventional or liberal handling is extremely excessive, ultrasound is a reliable option as part of monitoring. We aimed to evaluate pulmonary artifacts observed by ultrasonography in patients undergoing elective surgery under general anesthesia with conventional fluid replacement.

**Methods:** This was an observational, prospective, longitudinal study of 38 patients undergoing elective surgery in the period from March 1 to August 1, 2016 in the Civil Hospital of Culiacan included.

**Results:** We hope to continue these efforts of ours for training and education of anesthesiologists in the field of ultrasound guided Regional Anesthesia in India.
Obstetric

ESRA7-0047

DOES PREVENTION OF HYPOTHERMIA HELP IN ENHANCED RECOVERY OF PARTURIENTS AND ASSIST THEM TO LOOK AFTER THEIR NEWBORNS AFTER OBSTETRIC SURGERY?

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Background and Aims: Inadvertent perioperative hypothermia is defined as core temperature below 36°C and is common perioperative complication with associated poor patient outcomes. NICE published guidelines on the maintenance of normothermia during surgery but did not mention about obstetric patients. Inadvertent Hypothermia should be prevented by instituting temperature measurement and warming, in all elective and most emergency cases in an obstetric unit.

Methods: We prospectively recorded pre, intra and postoperative temperature, either by tympanic membrane or skin electrode, of the patients coming to obstetric theatres. We used active warming devices like fluid warming in theatre and fluid warming + forced air warming devices in recovery. We tried Indietherm mattress and forced air warming in theatre but could not continue due to awake patients and technical reasons.

Results: 75% patients had their temperature recorded before arrival to theatre. Category 1 LSCS was most common when preoperative temperature was not recorded. There was poor recording of intra-operative temperature, possibly due to awake patients. All the patients were actively warmed with fluid warmers in theatre and fluid warmers + forced air warming devices in recovery. We tried Indietherm mattress and forced air warming in theatre but could not continue due to awake patients and technical reasons.

Conclusions: Continuous temperature recording by a skin electrode should be made mandatory for all the patients intra-operatively. We should educate theatre and recovery staff about the importance of temperature management, use of active warming devices and continue to warm fluids in all patients. We need to increase ambient temperature in recovery areas as it helps in keeping both mother and the baby warm, and should consider guidelines for temperature management in obstetric patients.

Obstetric

ESRA7-0214

COMBINED SPINAL-EpidURAL TECHNIQUE FOR LABOUR ANALGESIA. A COMPARATIVE STUDY WITH CONTINUOUS EPIDURAL ANAESTHESIA

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Background and Aims: Lumbar epidural analgesia is an effective technique that is routinely employed for pain relief in labour. The combined spinal-epidural technique is beneficial due to the use of lower doses of local anaesthetics (LA) and rapid onset of analgesia. The aim of the study was to comparatively evaluate the effectiveness and safety of both techniques: combined spinal-epidural and continuous epidural analgesia in parturients undergoing labour analgesia.

Methods: Eighty ASA I and II parturients, with cephalic presentation and cervical dilatation less than six centimeters, undergoing labour analgesia, distributed into 2 groups according to anaesthetic technique: combined spinal-epidural (GI) and continuous epidural (GII) analgesia. Pain intensity before block performance; time until complete analgesia; degree of motor block; time until total cervical dilatation; duration of the 2nd stage of labour; pain intensity during the 1st and 2nd stages of labour; mode of delivery; use of oxytocin during labour; cardiovascular/pulmonary parameters, adverse maternal events; and neonatal repercussions were assessed.

Results: During block performance, pain intensity was similar in both groups. The onset of pain relief was faster and pain scores in the first and second stages of labour were lower in GI. There was an increased rate of additional pain medication with LA in GII. The rates of spontaneous and instrumental vaginal deliveries were higher in GI and GII, respectively. The lack of maternal alterations, neonatal repercussions, and pruritus was more common in GI.

Conclusions: The combined spinal-epidural technique was shown to be effective, resulting in improved quality of analgesia and more patient comfort.

Obstetric

ESRA7-0325

A QUALITY IMPROVEMENT PROJECT TO INCREASE USAGE OF INTRA-OPERATIVE CELL SALVAGE IN OBSTETRICS-MAKING CHANGE STICK

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Background and Aims: The use of intra-operative cell salvage (ICS) reduces allogeneic blood transfusion by 40% and its use in obstetrics has been endorsed by many national organisations. Predicting which patients will benefit from ICS is difficult as the risk factors for postpartum haemorrhage (PPH) are wide ranging. An audit in 2014 identified the risk of significant blood loss to be higher in emergency caesarean sections and introduced new guidelines recommending the use of ICS (collection only) for all non-elective caesarean sections and included ICS as a prompt in the WHO checklist.

Methods: A prospective audit of ICS use during elective and emergency caesarean sections was performed over 4 weeks in 2014. Other departmental staff were not made aware of the audit as we did not want the conduct of the audit to influence the results. As a result, a new protocol was introduced. Using our Epidural Audit system database, we have retrospectively assessed how ICS usage has changed over time since the new guideline and altered WHO checklist were introduced.

Results: Our audit demonstrates that the change in guidelines and inclusion of a specific prompt regarding ICS usage in the WHO checklist has had a significant and positive effect on ICS usage. However, usage shows a gradual decline due to factors such as time pressures, unfamiliarity with equipment and multidisciplinary engagement.

Conclusions: Our audit demonstrates the point of securing sustainability and addresses the challenges of maintaining change in a department with frequent staff changes, periods of intensive workload and offers possible solutions to secure sustainability.
Results: No statistically significant difference between the educational state, occupational status, anesthesia experience and choice of anesthesia technique. The average STAI-1 points were 53.08±7.92 in general anesthesia and 47.15±6.65 in spinal anesthesia, the difference was meaningful. No meaningful difference was found between the groups according to the STAI-2. The average scores of QoR-40 were 170.60±11.06 in general anesthesia, 175.33±7.75 in spinal anesthesia and the difference was significant statistically.

Conclusions: In our study the patients having high points of anxiety chose general anesthesia. But patient satisfaction in the spinal anesthesia group was higher than the general anesthesia group. We think that the patient’s anxiety about anesthesia type can be cleared with information given by anesthesiologist and surgeon. And we may increase spinal anesthesia preference which is safer method for mothers and babies.

Obstetric

ESRA7-0327
SUCCESS OF LABOUR EPIDURAL EXTENSION FOR CAESAREAN SECTION BEFORE AND AFTER PROTOCOLISED USE OF LIDOCAINE – A RETROSPECTIVE AUDIT
Gladstone G., Bates B., Hammebeck H., and Rashid A. Bedford Hospital, Department of Anaesthesia, Bedford, United Kingdom.

Background and Aims: If a parturient has a functioning labour epidural and requires emergency Caesarean Section (CS) the epidural should be extended to provide surgical anaesthesia without delay. A systematic review published in British Journal of Anaesthesia in 2011 found that lidocaine based mixtures demonstrated superior speed in extending epidural labour analgesia for CS. In January 2013, we standardised our epidural top-up mix to 2% lidocaine 18mls with 1/1000 adrenaline 0.1mls and 8.4% sodium bicarbonate 2mls (LAB) and wished to assess if there was a corresponding reduction in conversion to general anaesthesia (GA) in patients with pre-existing epidurals requiring CS.

Methods: After local audit department approval, we retrieved data from our obstetric anaesthesia database for the 2 years (01/01/2011-31/12/2012) before and after (01/01/2014-31/12/2016) the change in protocol.

Results: Results are outlined in Table 1.

<table>
<thead>
<tr>
<th>TABLE 1:</th>
<th>Before new top-up mix</th>
<th>After new top-up mix</th>
</tr>
</thead>
<tbody>
<tr>
<td>No of live births</td>
<td>6495</td>
<td>6054</td>
</tr>
<tr>
<td>No of women with epidural labour analgesia (%)</td>
<td>1597 (24.6%)</td>
<td>1446 (23.9%)</td>
</tr>
<tr>
<td>No of women with epidural labour analgesia posted for LSCS (%)</td>
<td>472 (29.4%)</td>
<td>416 (28.4%)</td>
</tr>
<tr>
<td>No of women with epidural labour analgesia posted for LSCS requiring GA (%)</td>
<td>50 (10.6%)</td>
<td>29 (7.0%)</td>
</tr>
</tbody>
</table>

Despite the superior speed of onset, the major concern was that the time taken to freshly prepare the LAB mix might negate the advantages of rapid onset. We introduced a ‘top-up box’, with printed instructions on the top in which all the necessary syringes and ampoules were kept, to reduce the preparation time.

Conclusions: Introduction of protocolised LAB top-up mix appears to have reduced the conversion rate to GA in women with labour epidurals posted for LSCS.

Obstetric

ESRA7-0205
ANESTHESIA MANAGEMENT FOR SECTIO CESARIAN DELIVERY IN PATIENT WITH MITRAL STENOSIS
Husodo D.P., Hartono R. and Basuki D.R. Brawijaya University, Anesthesiologist and Intensivist Care, Malang, Indonesia.

Background and Aims: Mitral stenosis is the most common rheumatic valvular lesion seen in pregnancy due to its prevalence in young women. Approximately 25% of patients with mitral stenosis become symptomatic for the first time during pregnancy. Some author said neuraxial anesthesia is contraindicated due to the risk of hypotension after spinal anesthesia.

Methods: To prove the effectiveness of using low dose spinal anesthetic in combination with an opioid adjuvant towards 24-years old primigravida, in labor at 32-34 weeks of gestation with severe Mitral Stenosis, Mild Mitral Regurgitation, Moderate Tricuspid Regurgitation, moderate pulmonary regurgitation (EF 62%), moderate pulmonary hypertension (PASP 65mmHg), Heart Failure st C Functional Class 3. The second case is general anesthesia toward 30 y.o woman in labor at 30-32 weeks of gestation with severe preclampsia, RHD, Moderate Mitral Stenosis, Moderate Mitral Regurgitation, Severe Tricuspid Regurgitation, Pulmonary Hypertension severe, acute lung oedema dd Pneumonia CAP.

Results: Both general anesthesia and low dose spinal show good outcome of the patient as long as we can prevent sudden decrease of hemodynamic, avoid tachycardia, avoid hypotension, and avoid over hydration.

Conclusions: Primary concerns in patients with MS include management of heart rate, ventricular preload, potentially diminished right and left ventricular contractile function, and coexisting pulmonary hypertension. The most important hemodynamic goal is to avoid tachycardia that can make decrease time for diastolic filling. Elevated flow states, such as increased sympathetic activity from any source, can dramatically increase the pressure gradient across the valve.

Obstetric

ESRA7-0023
LOW DOSE SPINAL ANESTHESIA FOR SECTIO CESARIAN DELIVERY IN PATIENT WITH SEVERE MITRAL STENOSIS
Husodo D.P, Hartono R. and Basuki D.R. Brawijaya University, Anesthesiologist and Intensivist Care, Malang, Indonesia.

Background and Aims: Mitral stenosis is the most common rheumatic valvular lesion seen in pregnancy due to its prevalence in young women. Approximately 25% of patients with mitral stenosis become symptomatic for the first time during pregnancy. Some author said neuraxial anesthesia is contraindicated due to the risk of hypotension after spinal anesthesia.

Methods: To prove the effectiveness of using low dose spinal anesthetic in combination with an opioid adjuvant towards 24-years old primigravida, in labor at 32-34 weeks of gestation with severe Mitral Stenosis, Mild Mitral Regurgitation, Moderate Tricuspid Regurgitation, moderate pulmonary regurgitation (EF 62%), moderate pulmonary hypertension (PASP 65mmHg), Heart Failure st C Functional Class 3.

The cesarean section performed under low dose anesthesia used 5 mg of bupivacaine heavy 0.5% and 50 mcg of Fentanyl with the total volume was 2 cc injected in less than 10 seconds through Tuftier’s line.

Results: Neuroaxial block was achieved in just 5 minutes. It’s been stabilized hemodynamic prior to post injection, after delivery, and post operative. There is no acute heart failure and decrease of hemodynamic in post operative evaluation in ICU. The patient dismissed safely from hospital in the 7th day post operative.

Conclusions: Low dose spinal anesthesia using 5 mg of bupivacaine heavy 0.5% and adjuvant opioid fentanyl 50 mcg can be successfully used for the performance of Cesarean delivery in severe mitral stenosis patient as regards to onset, adequacy level, duration of the block, haemodinamic stability and good fetal outcome.
Background and Aims: Accidental dural puncture (ADP) and post-dural puncture headache (PDPH) are important complications of regional anesthesia. The incidence of PDPH is estimated to be between 0.5%-5% following spinal anesthesia and up to 8%-10% following ADP during epidural catheter insertion specifically in the pregnant woman. Although usually a benign complication, PDPH can result in serious complications such as subdural hematoma and seizures, which could be fatal. Prevention of PDPH is therefore an important topic. Epidural blood patch (BP) is the most effective treatment of PDPH. Prophylactic BP has shown its efficacy to prevent PDPH; nevertheless, it may be insufficient. Inserting the catheter intrathecally after ADP to prevent PDPH has gained popularity. No clear consensus exists on how to best prevent severe headache from occurring after ADP.

Methods: We report an ADP case before induction of caesarean section in a 32 year-old parturient. To avoid PDPH, an intrathecal catheter was immediately inserted after ADP and an epidural catheter was also inserted at the interspace above. An epidural block was established with the incremental doses of ropivacaine/fentanyl mixture. A full-term male neonate was born. Both catheters were maintained initially for 24 hours: the intrathecal catheter was kept in place to avoid Cerebrospinal fluid leakage, and the epidural one in order to make a prophylactic BP. A prophylactic BP was performed immediately after removal of the intrathecal catheter.

Results: The patient did not experience any headache and neurologic symptoms.

Conclusions: After ADP, inserting the epidural catheter intrathecally-/ prophylactic BP may be a good alternative approach to prevent PDPH.

ESRA7-0295
FATAL AMNIOTIC FLUID EMBOLISM AFTER DELIVERY
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Background and Aims: Amniotic fluid embolism (AFE) is a rare but potentially catastrophic obstetric complication, because of its unpredictability, rapid evolution and high mortality rate. In our case, a fatal AFE in the immediate postpartum period occurred.

Methods: A 23-year-old, healthy, full-term, labouring woman required a rapid vaginal delivery for foetal distress. A postpartum haemorrhage occurred and the patient became confused, tachycnemic, tachycardic and hypotensive. The bleeding was treated according to commonly used algorithm and resolved without any particular problems. However, the patient continued to be critical, so she was intubated to allow better resuscitation. Postintubation SpO2 was > 95% with 50% FiO2. Suddenly we noticed a rapid decrease of ETCO2, desaturation and ECG modification until asystole.

Results: Advanced cardiac life support (ACLS) was initiated immediately with chest compression and adrenaline 1 mg was administrated, without improvement in vital signs. Transthoracic echocardiography detected a right ventricular dilatation and bradycardia, postulated to be from high block affecting sympathetic cardiac acceleration. Safety tests of aspira- tion and adrenaline-containing test dose weren’t performed due to GA being given. 3 hours later, she needed an emergency crash Caesarean section due to fetal distress. General anaesthetic (GA) was administered with airway secured via rapid sequence induction. Intraoperatively, she had a combined spinal epidural uneventfully with good analgesia without motor block. Dural block was established with the incremental doses of bupivacaine/fentanyl mixture. A full-term male neonate was born. Both catheters were maintained initially for 24 hours: the intrathecal catheter was kept in place to avoid Cerebrospinal fluid leakage, and the epidural one in order to make a prophylactic BP. A prophylactic BP was performed immediately after removal of the intrathecal catheter.

Results: The patient did not experience any headache and no neurologic symptoms.

Conclusions: After ADP, inserting the epidural catheter intrathecally-/ prophylactic BP may be a good alternative approach to prevent PDPH.
Background and Aims: For several thousand years, the East and Southeast Asians have carried out acupuncture to facilitate child birth and birth induction.

Methods: In order to objectify the effect of acupuncture on the production of birth contractions, I have carried out body and auriculo acupuncture once a week from the 36th week of pregnancy till the date of birth for birth preparation and birth relief. This acupuncture produces light labor contraction pains which prepare the uterus for birth. Starting from the expected date of birth, the acupuncture sensitization test is performed to test whether the uterus responds well to acupuncture. If contractions occur under acupuncture, the acupuncture stress test should be performed to determine the child’s heart rate. If the uterine mouth is ready for birth, the acupuncture should be performed for the initiation of birth. The CTG shows how the contractions occur every 2 to 3 minutes under acupuncture until birth. The acupuncture points will be explicitly given for everyone.

Results: With the acupuncture technique given here, for a large number of older patients, the duration of birth could be shortened to as much as 1-2 hours. The average birth duration was between 4-5 hours and the mothers gave birth with less effort and experienced hardly any pain.

Conclusions: The above technique can be easily learned and with good mastery, almost no complications are to be expected. It is therefore especially recommended for almost every woman in Western Europe who is not afraid of acupuncture needles, which are not painful.

Obstetric

ESRA7-0179

A COMPARISON OF GENERAL AND REGIONAL ANAESTHESIA METHODS IN PATIENTS WITH PREECLAMPSIA

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Background and Aims: Preeclampsia is a hypertensive disorder specific to pregnancy. The type of anaesthesia method is one of the important parameters influencing the maternal and fetal outcomes.

It was aimed to compare regional and general anaesthesia methods regarding the clinical outcomes and complications.

Methods: A total of 86 preeclampsia patients who underwent cesarean section for various obstetrical indications were categorised into 2 groups according to receipt of regional (Group 1, n=66) or general anaesthesia (Group 2, n=20). Data regarding the demographic and clinical characteristics were obtained from the medical records. Patients were contacted by telephone postoperatively and asked to give satisfaction scores for the anaesthesia method, 1 point for the lowest satisfaction, 10 points for the highest satisfaction.

Results: The Groups 1 and 2 were statistically similar regarding the mean ages, the mean gravida and parity, the mean serum alanin-aminotransferase and aspartate-aminotransferase levels and the mean satisfaction scores. In Group 2, the mean gestational age at birth, mean birthweight and mean minute-1 APGAR scores were lower than in Group 1 (p=0.003, p=0.003, p=0.012 respectively). The rate of patients with severe preeclampsia, with a platelet count<100.000/μL and with a need for follow-up in intensive-care-unit were higher in Group 2 than in Group1 (p=0.039, p=0.024, p=0.001 respectively). The rate of the need for intrapartum isotropic agent administration was similar between the groups.

Conclusions: It was determined that in patients with severe preeclampsia and with low platelet count, general anaesthesia was preferred more than regional anaesthesia. No major complications related to anaesthesia developed in any of the groups.

Obstetric

ESRA7-0139

EFFECTS OF EPIDURAL AND INTRAVENOUS REMIFENTANIL ANALGESIA DURING LABOR ON NEONATAL OUTCOME - RETROSPECTIVE OBSERVATIONAL STUDY

Sobot Novakovic S., Cuk S., Lazic G., Rakanovic D., Ceric Banicevic A., Draganovic D. and Visekruna L.
University Clinical Center of Republic of Srpska, Department of Anesthesiology and Intensive Care Unit, Banja Luka, Bosnia - Herzegovina. University Clinical Center of Republic of Srpska, Department of Gynecology and Obstetrics, Banja Luka, Bosnia - Herzegovina. University Clinical Center of Republic of Srpska, Department of Pediatrics, Banja Luka, Bosnia - Herzegovina.

Background and Aims: We evaluated the clinical outcome of term neonates born to mothers who received epidural analgesia (E) or systemic analgesia with remifentanil (R) during labor.

Methods: Data was collected retrospectively over the course of one year. We have evaluated the medical records of 247 full term neonates, 208 were born to mothers who received E and 39 to mothers who received R. Data on Appar scores and perinatal complications (infection, sepsis, hyperbilirubinemia, perinatal injuries, apnoeas), and average hospital stay were collected. Mann-Whitney U test, chi square test, and logistic regression analysis were used where appropriate.

Results: Mean Appar scores in 1st and 5th minute between E and R were similar (8.83 vs. 8.97 P = 0.252; 9.81 vs. 9.87, P = 0.762, respectively). Average neonatal hospital stay was not different between groups (4.19 vs. 4, P = 0.557). The percentage of neonates with any perinatal complication were similar between groups (28.3% vs. 32.5%, P = 0.598). Neonates born by cesarean delivery (CD) had statistically significant worse outcomes compared to neonates that were delivered vaginally (odds ratio 2.8 95%CI [1.30647-6.17692]).

Conclusions: We did not find statistically significant difference in mean Appar scores and perinatal complications between neonates who received epidural vs. remifentanil analgesia. We measured an increased rate of complications in neonates born via CD. Fetal indications for CD may be a significant confounder explaining this finding. Future studies should have a greater sample size and be powered to detect such associations.
Low-dose epidural morphine administration is associated with higher mortality rates in Indonesia. Hyperbaric lidocaine is considered to be a more ideal agent for short procedures. This study was going to describe the action of low dose hyperbaric lidocaine, and its potential adverse effects in patients underwent Cesarean Section in RSUD Dr. Soetomo, Surabaya, Indonesia.

**Background and Aims:** Neuraxial anesthesia is usually done in Cesarean Section. Bupivacaine is the newer agent for spinal anesthesia but it is associated with higher mortality rates in Indonesia. Hyperbaric lidocaine is considered to be a more ideal agent for short procedures. This study was going to describe the action of low dose hyperbaric lidocaine, and its potential adverse effects in patients underwent Cesarean Section in RSUD Dr. Soetomo, Surabaya.

**Methods:** This was a cross-sectional study. All patients which were undergone Cesarean Section with spinal anesthesia alone were included in this study.

**Results:** Patients underwent Cesarean Section with spinal anesthesia alone was done in 173 patients. Hyperbaric lidocaine was given in 50 mg (47 patients), 60 mg (52 patients), or 75 mg (84 patients). After 3 minutes, height of sensory block were noted at Th 4 in 20 patients (12%), Th 5 in 114 patients (66%), and Th 6 in 39 patients (22%). Adverse effects found in this study were hypotension (98%), nausea (92%), vomiting (24%), and light-headed (34%). Onset of action were noted before 3 minutes after administration of hyperbaric lidocaine in 50 mg (95%), 60 mg (97%), and 75 mg (98%). Block duration were measured more than 2 hours after onset of hyperbaric lidocaine in 50 mg (69%), 60 mg (75 mg), and 75 mg (98%). There were no complications, such as transient neurologic symptoms (TNS) or cauda equina syndrome, found in this study.

**Conclusions:** Low dose hyperbaric lidocaine has advantages and can be used routinely for spinal anesthesia on cesarean section.
Background and Aims: Measles is a highly-contagious respiratory disease, characterized by rash with potential complications such as pneumonia or encephalitis. Pregnant women are at increased risk for complications, including adverse perinatal outcomes, with up to 10% maternal mortality rate. Treatment is largely supportive with no specific antiviral therapy available.

Methods: A 31 year-old female at 27 weeks gestation was initially admitted for pneumonia, with bilateral consolidation evident on CXR. She remained febrile and developed a generalised maculo-papular rash. Throat swab was positive for measles RNA. She subsequently went into premature labour with abnormal fetal presentation. An emergency caesarean delivery was planned. Single-shot spinal technique (13 mg 0.5% heavy bupivacaine, fentanyl 15mcg and morphine 100mcg) using a 27G pencil-point needle was performed in the sitting position. Surgery proceeded uneventfully and a baby girl was delivered.

Results: The safety of neuraxial anaesthesia in septic parturients remains a controversy. The theoretical risk of introducing infective viral material into the CNS during a neuraxial block, resulting in meningitis or encephalitis has been discussed. Moreover, if post-operative headache occurs, distinguishing neurological complications secondary to neuraxial blockade from those arising from the disease may be a challenge. Our choice of spinal anaesthesia minimizes the risk of pneumonia exacerbation and potential ARDS. Due to the extensive rash, precautions were taken to avoid the skin lesions during spinal needle placement. The use of pencil point needle has also been advocated as tissue coring is prevented.

Conclusions: Multidisciplinary approach with tailored anaesthetic technique is necessary for favourable maternal and foetal outcomes.

Pediatric

ESRA7-0134

AXILLARY BRACHIAL PLEXUS BLOCK IN PEDIATRICS


Background and Aims: Most ultrasound guided regional anaesthesia techniques in adults are performed awake or with minimal sedation. In contrast, regional anaesthesia in children and infants is performed under either deep sedation or general anaesthesia. There are no conclusive data regarding the safety of administration of regional block in awake vs anaesthetized children.

Methods: We describe a case of 10 year old male patient for closed reduction and internal fixation with k-wire of fracture base of first metacarpal of left hand. In addition patient had facial-maxillary injury with loose upper incisors. A dental procedure was planned at a later stage to preserve the permanent incisors.

Results: The block lasted for around 4 hours. The child was discharged after confirming complete block recovery. Possible permanent damage to the loose incisors under general anaesthesia was avoided.

Conclusions: Ultrasound guided peripheral nerve blocks can be considered in awake or mildly sedated paediatric patients.

Pediatric

ESRA7-0094

EFFECT OF CLONIDINE AS AN ADJUVANT TO ROPIVACAINE IN ULTRASOUND GUIDED TRANSVERSES ABDOMINIS BLOCK IN CHILDREN – A RANDOMIZED CONTROLLED TRIAL.

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Background and Aims: This was a prospective, randomized, single-blinded, double- blind trial conducted to assess the efficacy and safety of SC ropivacaine 0.2% compared to HC 0.2% for postoperative analgesia in children undergoing inguinal hernia repair.

Methods: In this study, 60 patients were randomized into two groups: the ropivacaine group and the HC group. The study outcomes were pain management, side effects, and satisfaction of patients. Data were recorded at 30 min, 1, 2, 4, and 6 h postoperatively. The primary outcome was the pain score at the first postoperative hour.

Results: No significant differences were observed between the two groups in terms of pain scores at all measured time points. There were no significant differences in side effects or satisfaction between the two groups. No patients required rescue medication.

Conclusions: SC ropivacaine 0.2% was as effective as SC HC 0.2% for postoperative pain management in children undergoing inguinal hernia repair.

References:

FIGURE 1.
ESRA7-0286

PREDICTION OF MORTALITY BY PEDIATRIC RISK OF MORTALITY (PRISM III) AND PEDIATRIC INDEX OF MORTALITY (PIM III) IN POST ANESTHESIA CARE UNIT (PACU)

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Background and Aims: Mortality prediction models, PRISM III and PIM III are important tools for monitoring the quality of intensive care and prediction of mortality. The aim of the current study was to assess PRISM III and PIM III ability in predicting the pediatrics outcomes (survivors, non-survivors) in the PACU.

Methods: This was an observational and prospective study of 42 consecutive patients admitted in the PACU during six month period.

Demographic information recorded on a checklist, also information about Severity of disease Calculated based on PRISM III and PIM III scoring systems in the first admission 24 hours. Hosmer-Lemeshow test, logistic regression, and receiver operating characteristic (ROC) curves were used in statistical analysis (95% confidence interval).

Results: Data analysis showed a significant statistical difference between outcomes and both PRISM III and PIM III Scores (p<0.01, P<0.001). The ROC-curve analysis suggested that the predictive ability of PIM III is slightly better than PRISM III. For PRISM III the area under the ROC curve was 91.2% (standard error [SE] 3.8%), and for PRISM III it was 88.8% (SE 3.4%), also the Hosmer-Lemeshow statistic revealed both models had good calibration, for PRISM III (χ²= 6.152, P = 0.342), and for PIM III (χ²= 7.451, P = 0.612).

Conclusions: The survivors had significantly lower PRISM III and PIM III scores compared to non-survivors, so these tools are reliable to predicting outcomes in critically ill children.

ESRA7-0288

PERFORMANCE OF THE PEDIATRIC RISK OF MORTALITY (PRISM) III AND PEDIATRIC LOGISTIC ORGAN DYSFUNCTION (PELOD) II SCORES IN CRITICALLY ILL CHILDREN

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Background and Aims: PRISM III and PELOD II are widely used severity of illness scoring systems of pediatric intensive care units. The aim of the current study was to evaluate PRISM III and PELOD II ability in predicting the critically ill children outcomes (survivors, non-survivors) in surgical and medical ICU.

Methods: This was an observational and prospective study of 48 consecutive patients admitted in surgical and medical ICU during 6-month period. PRISM III and PELOD II scores and demographic characteristics were recorded for each patient separately in the first admission 24h.

Receiver operator characteristic (ROC) curves, Hosmer-Lemeshow test and Logistic regression were used in statistical analysis (95% confidence interval).

Results: Data analysis showed a significant statistical difference in PRISM III and PELOD II scores between survivor and Non-survivor patients (p<0.01, p<0.04; respectively). The discrimination power was good for both PRISM III and PELOD II (area under ROC (AUC) curve: 81.5% (SE: 2.9%), 86.4% (SE: 3.3%); respectively). The Calibration was good for PRISM III with a x² of 8.2 in the GOE test (p=0.191) and acceptable for PELOD II (x² = 9.6, p=0.059).

Conclusions: Both PRISM III and PELOD II showed good predictive accuracy for pediatrics outcomes in surgical and medical ICUs, so they are useful tools for the assessment of prognosis for pediatric patients admitted to intensive care units.
Results: Patients underwent ilioinguinal hernia repair (28; 84.8%), or hydrocele plication (5; 15.2%). A variety of different analgesia strategies were used (Table 1).

No adverse effects were noted following local anaesthetic infiltration (LAI) or ilioinguinal blockade. One case of urine retention occurred in the caudal group.

Three of twelve cases (25%) receiving LAI had moderate pain in recovery; no patients in other groups had moderate or severe pain. Patients receiving LAI or no regional/local anaesthetic had a higher opiate requirement postoperatively than patient receiving a regional blockade, and higher non-opiate analgesia requirement in recovery than patients receiving ilioinguinal blockade (Table 2).

Conclusion: These data suggest that there are a variety of analgesia strategies used for paediatric day case surgery. however within our practice regional blockade appears most effective. Regional techniques met the RCoA standards of ‘less than 5% of patients having moderate to severe pain postoperatively’ whereas LAI did not. Furthermore, post-operative opiate requirement was reduced in patients receiving a regional blockade. Further work is required to maximise perioperative paediatric analgesia and to identify subgroups where specific approaches may be most effective.

ESRA7-0323
BILATERAL ADDUCTOR CANAL BLOCK IN CHILDREN?
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Methods: Perioperative pain as a vital sign to treat is increasingly complex, bilateral procedures confront us in a scenario that limits in many cases the ambulatory management of patients by the possibility of treating it with the least side effects.

Methods: We wanted to report an 11-year-old patient scheduled for bilateral hemiepiphysiodesis in an ambulatory surgical setting under general anesthesia with fentanyl, sevoflurane, dexamethasone, ketamine at low doses, acetaminophen, bilateral adductor canal block with ultrasound was performed with bupivacaine 0.25% EC 1: 400,000, plus oral acetaminophen every 6 hours for 3 days in the postoperative period.

Results: In the recovery unit the visual pain scale was 0/10, no rescue analgesia was required, no nausea, no vomiting, the patient reported high levels of satisfaction, and there were no complications related to the blockade reported by the patient or their families.

Conclusions: The use of regional anaesthesia techniques has become a primordial tool in the treatment of acute postoperative pain, in the prevention of chronic pain, in the functional recovery: and allows every day to increase the possibilities of performing ambulatory procedures with great satisfaction of the patients. We are very committed in the treatment of acute pain, chronic pain prevention, functional recovery, our strategy for prevention is regional analgesia guided by US; the priority is a patient-centered care with standardized protocols and high levels of patient satisfaction.

ESRA7-0098
COMPARISON OF SUB-TENON BLOCK, PERIBULBAR BLOCK AND IV FENTANYL FOR PERIOPERATIVE ANALGESIA IN PAEDIATRIC CATARACT SURGERY
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Methods: Congenital cataract surgery is the most commonly performed intraocular surgery. Ophthalmic blocks in children were previously studied by various researchers in conjunction with general anaesthesia.

We designed this prospective randomised, study to evaluate the effect of sub-tenon block, peribulbar block on perioperative analgesia & compare with IV Fentanyl in children undergoing elective cataract surgery.

Primary outcome: IO & PO fentanyl, paracetamol requirement, TFA.

Methods: After approval by the institutional ethics committee and informed written parental consent, 60 children of ASA grade I and II, Age (6m-10 yrs.) undergoing lens extraction surgery under GA were allocated into three groups.

Group 1: STB (n=20) subtenon block
Group 2: PB (n=20) peribulbar block
Group 3: F(n=20) Control group. No block

Block groups received 0.5% bupivacaine (0.06-0.08ml/kg) along with hyaluronidase 10 IU/ml.

Conclusion: Sub-tenon block contributed significantly to immediate postoperative analgesia, faster recovery, better surgeon satisfaction & operative conditions. Block groups were comparable in terms of perioperative rescue analgesia consumption. Incidence of OCR, PONV and parental satisfaction score were comparable between all the three groups.

ESRA7-0144
TRANSVERSUS ABDOMINIS PLANE BLOCK FOR POSTOPERATIVE ANALGESIA IN NEONATES AND YOUNG INFANTS: RETROSPECTIVE ANALYSIS OF A CASE SERIES
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Methods: Thirty-four cases of neonates and infants with (whom) applied TAP block were retrospectively analyzed. The TAP block was performed postoperatively in supraumbilical surgeries and preoperatively in infraumbilical surgeries. The TAP block was applied with 0.8 ml/kg of 0.25% bupivacaine in unilateral approach and 1.6 ml/kg of 0.125% bupivacaine in bilateral approach. The CRIPS Pain Scale was used for postoperative pain measurement of neonates.

Conclusions: The effectiveness of the TAP block in children has been well characterized in literature. However, there are only few reports about TAP block in the neonates and low birth weight groups. This is a retrospective observational analysis of ultrasound – assisted TAP blocks in neonates and young infants. The aim of this study to analyze retrospectively the analgesic effectiveness of TAP block in neonates and infants undergoing abdominal and inguinal surgeries.

Methods: Thirty-four cases of neonates and infants with (whom) applied TAP block were retrospectively analyzed. The TAP block was performed postoperatively in supraumbilical surgeries and preoperatively in infraumbilical surgeries. The TAP block was applied with 0.8 ml/kg of 0.25% bupivacaine in unilateral approach and 1.6 ml/kg of 0.125% bupivacaine in bilateral approach. The CRIPS Pain Scale was used for postoperative pain measurement of neonates.
Results: The patient’s age ranged from 2 to 88 day-old with a mean (SD) of 36.2(24.2). Eleven of them were premature babies. The weight ranged from 1.6 to 5.8 with a mean (SD) of 3.7kg (1.1). Twenty-nine patients were extubated at the end of the surgery and the other patients within 12 hours. 67.7% infants required no additional postoperative analgesic in 24 hours and none of them required narcotic analgesics.

Conclusions: There are only few reports about TAP block in the neonates and low birth weight groups. Our conclusion is that use of TAP blocks results in low analgesic requirements and a low incidence of postoperative intubation and mechanical ventilation in neonates and infants.

Peripheral Nerve Blocks

ESRA7-0130

COMPARISON OF ANALGESIC EFFECTS AND CATHETER-RELATED COMPLICATIONS OF CONTINUOUS FEMORAL NERVE BLOCK BETWEEN CATHETER-OVER-NEEDLE AND CATHETER-THROUGH-NEEDLE: A RETROSPECTIVE, PROPENSITY SCORE-MATCHED STUDY

Abe S., Sakura S., Aoyama Y., Wada M., Sakakibara S., and Saito Y. Shimane University Hospital, Department of Anesthesiology, Izumo city, Japan.

Background and Aims: Continuous femoral nerve block (CFNB) is increasingly used for postoperative pain relief after knee surgery. However, despite its possible advantages over single-injection block, CFNB may be associated with catheter-related complications that may result in a decrease in postoperative analgesia. There have been different catheter insertion techniques, among which catheter-related complications and analgesic effects during CFNB may differ. Accordingly, the present study was conducted to compare the incidences of catheter-related complications and pain scores after major knee surgical procedures between catheter-through-needle (CTN) and catheter-over-needle (CON) for CFNB.

Table 1

<table>
<thead>
<tr>
<th>Age (yr)</th>
<th>Height (cm)</th>
<th>Weight (kg)</th>
<th>M/F</th>
<th>Operation time (min)</th>
<th>Insertion length of catheter (cm)</th>
<th>Surgical procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Patients</td>
<td>CON</td>
<td>CTN</td>
<td>P Value</td>
<td>CON</td>
<td>CTN</td>
<td>P Value</td>
</tr>
<tr>
<td>43.4 ± 25</td>
<td>42.7 ± 25</td>
<td>0.72</td>
<td>160 ± 10</td>
<td>161 ± 11</td>
<td>0.76</td>
<td>61.1 ± 12</td>
</tr>
</tbody>
</table>

Data are presented as mean ± standard deviation, median (interquartile range) or n (%).

Table 2

<table>
<thead>
<tr>
<th>All Patients</th>
<th>CON</th>
<th>CTN</th>
<th>P Value</th>
<th>CON</th>
<th>CTN</th>
<th>P Value</th>
<th>CON</th>
<th>CTN</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trouble</td>
<td>16 (9)</td>
<td>57 (31)</td>
<td>&lt;0.01</td>
<td>7 (4)</td>
<td>32 (18)</td>
<td>&lt;0.01</td>
<td>10 (5)</td>
<td>9 (5)</td>
<td>0.81</td>
</tr>
<tr>
<td>Leakage</td>
<td>1 (1)</td>
<td>17 (9)</td>
<td>&lt;0.01</td>
<td>3 (1-5)</td>
<td>3 (1-4)</td>
<td>0.07</td>
<td>6 (4-7)</td>
<td>5 (3-7)</td>
<td>0.85</td>
</tr>
<tr>
<td>Accidental withdrawal</td>
<td>10 (5)</td>
<td>9 (5)</td>
<td>0.81</td>
<td>3 (1-5)</td>
<td>3 (1-4)</td>
<td>0.07</td>
<td>6 (4-7)</td>
<td>5 (3-7)</td>
<td>0.85</td>
</tr>
<tr>
<td>Bleeding</td>
<td>1 (1)</td>
<td>17 (9)</td>
<td>&lt;0.01</td>
<td>3 (1-5)</td>
<td>3 (1-4)</td>
<td>0.07</td>
<td>6 (4-7)</td>
<td>5 (3-7)</td>
<td>0.85</td>
</tr>
</tbody>
</table>

Data are presented as mean ± standard deviation, median (interquartile range) or n (%).

Methods: After IRB approval, we conducted a retrospective analysis of data that had been collected prospectively from patients undergoing knee surgery with CFNB between 2007 and 2017 at Shimane University Hospital in Japan. We compared catheter-related complications and postoperative pain using visual analog pain scores (VAS) for 48 h postoperatively between CTN (18G Tuohy needle, Smith Medical, short axis view/out-of-plane approach) and CON (Contiplex C, B.Braun, short axis view/in-plane approach). The two groups were matched using propensity score matching. The catheter-related complications included leakage, bleeding, and accidental withdrawal.

Results: The main results are shown in tables 1 & 2. When compared with CTN, CON was associated with statistically fewer events of leakage and bleeding. Postoperative VAS was lower in the CON group than in the CTN group (with movement at 48 h).

Conclusions: CFNB using CON in patients for 48 h after major knee surgery resulted in fewer catheter-related complications than CFNB using CTN. In addition, the use of CON technique also provided better postoperative pain relief.

Peripheral Nerve Blocks

ESRA7-0259

THE INFRACLAVICULAR BLOCK: A CADAVER STUDY ANALYZING THE RAJ APPROACH MODIFIED BY BORGEAT

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Medical center St Blagovoshtenie, Anesthesiology, Bansko-, Bulgaria, 2Spital Buelach, Anesthesiology, Buelach, Switzerland, 3University of Graz, Anatomy, Graz, Austria, 4Bulgarian University Hospital, Anesthesiology, Zurich, Switzerland.

Background and Aims: The infraclavicular block is commonly performed using different approaches. However, many of them have not been studied using anatomical model with radiological confirmation of local anesthetic spread.

Methods: Fifteen human cadavers (Thiel preservation) were analyzed using both infraclavicular regions. The infraclavicular region was dissected to allow a visually guided needle position to the different cords using the Raj Approach modified by Borgeat. The cadavers were divided into 3 equal groups. In Group 1 the needle was positioned towards the lateral cord, in Group 2 towards the posterior cord and in Group 3 towards the medial cord. Immediately after application of coloured contrast medium a CT scan was performed. The spread of the medium was analyzed using the sagital planes, the 3D reconstructions and anatomical dissection.

Results: In group 1 the medium spread mainly medial of the needle tip and distributed in the sagital plane mainly anterior-superiorly. In Group 2 the medium spread mainly lateral of the needle tip and in the sagital plane posterior-inferiorly and posterior-superiorly. In Group 3 the medium spread mainly lateral of the needle tip and in the sagital plane posterior-inferiorly.

Conclusions: The different needle positions according to the cords lead to different spread of the injected medium. This might be the explanation for the different clinical success rate using the Raj Approach modified by Borgeat depending on the needle position according to the cords.

Peripheral Nerve Blocks

ESRA7-0138

DELIVERATE PRACTICE WITH VALIDATED METRICS IMPROVES SKILL ACQUISITION IN PERFORMANCE OF ULTRASOUND GUIDED PERIPHERAL NERVE BLOCKS IN A SIMULATED SETTING

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1University College Cork, ASSERT Centre, Cork, Ireland, 2St Vincent's University Hospital, Department of Anaesthesia, Dublin, Ireland, 3University College Cork, Department of Anaesthesia, Cork, Ireland.

Methods: After IRB approval, we conducted a retrospective analysis of data that had been collected prospectively from patients undergoing knee surgery with CFNB between 2007 and 2017 at Shimane University Hospital in Japan. We compared catheter-related complications and postoperative pain using visual analog pain scores (VAS) for 48 h postoperatively between CTN (18G Tuohy needle, Smith Medical, short axis view/out-of-plane approach) and CON (Contiplex C, B.Braun, short axis view/in-plane approach). The two groups were matched using propensity score matching. The catheter-related complications included leakage, bleeding, and accidental withdrawal.

Results: The main results are shown in tables 1 & 2. When compared with CTN, CON was associated with statistically fewer events of leakage and bleeding. Postoperative VAS was lower in the CON group than in the CTN group (with movement at 48 h).

Conclusions: CFNB using CON in patients for 48 h after major knee surgery resulted in fewer catheter-related complications than CFNB using CTN. In addition, the use of CON technique also provided better postoperative pain relief.
Background and Aims: The objective of this study was to compare the effect of deliberate vs. self-guided practices on acquiring needling skills by novice learners.

Methods: Eighteen medical students were randomized to deliberate or self-guided practices groups. Following a learning phase, subjects attempted to perform a predefined task, which entailed advancing a needle towards a target on a phantom gel under ultrasound guidance. Subsequently, subjects practiced performing the task using previously validated metrics (Ahmed et al. 2016). Subjects in the deliberate practice group were coached by an expert anesthesiologist and practiced each metric until satisfactorily performed based on the supervising anesthesiologist assessment. Immediately after practice, all subjects attempted to perform same task again, and on the following day, made two further attempts in succession. Two trained anesthesiologists used the metrics to independently score the video-recorded performances.

Results: Compared with novices who self-guided their practice, those used deliberate practice completed more steps immediately after practice (median [range], 14.5 [12–15] vs. 3 [1–10], p < 0.0001) and 24 hours later, (15 [12–15] vs. 4.5 [1–11], p < 0.0001) and 24 hours later, (0 [0–3] vs. 6.5 [3–8], p < 0.0001 and 0 [0–3] vs. 4 [2–7], p < 0.0001), Figure 1. However, they spent more time on practice (mean (SD), 26.9 (5.42) minutes vs. 21.5 (5.31), p = 0.05).

Conclusions: Deliberate practice improved acquisition of needling skills by novices.

Peripheral Nerve Blocks

ESRA7-0018

SAFE INJECTION PRESSURE SIMULATOR IN REGIONAL ANAESTHESIA

Al-Ani T., and Staber M. Inverclyde Royal Hospital, Anaesthesia and Intensive Care, Greenock, United Kingdom.

Background and Aims: High opening injection pressure (OIP) ≥15 PSI during nerve block may indicate needle-nerve contact and cause damage. We describe a tactile feedback simulator (TFS) to train the operator’s hand to readily detect high OIPS and prevent forceful injections.

Methods: The simulator consists of an air filled 20ml syringe (Braun®) connected to a 3-way tap (Braun®). The tactile feedback is obtained by compressing the plunger from 20 to 10ml with the 3-way tap closed to atmosphere generating a pressure of 14.45 PSI (tested with Fluke® manometer as in the picture below).

Twenty anaesthetic staff participated in simulated high OIP nerve block using 20ml water filled syringe connected to non-distensible water primed injection line. The distal end was hidden, connected to a manometer and closed to atmosphere. Participants were asked to: 1) inject 5ml and stop if it is difficult to inject (pre-practice), then 2) practice safe injection pressures using the TFS and finally 3) inject 5ml and stop if it is difficult to inject (post-practice). Maximum injection pressures in 1 and 2 were recorded. Paired t-test was used to analyse data.

Results: Only 25% (n=20) of participants in the pre-practice group injected with pressures less than 15 PSI compared with 100% (n=20) in the post-practice group. The mean pressure difference between pre and post practice groups was 12.43 PSI (p value <0.0001).

Conclusions: Implementing tactile feedback simulators for training of safe OIPs could improve safety in nerve blocks.
Peripheral Nerve Blocks

ESRA7-0274

SERRATUS ANTERIOR PLANE BLOCK FOR RIB FRACTURES

Ang K.S., and Sage F. East Surrey Hospital, Anaesthetics, Redhill, United Kingdom.

Background and Aims: Serratus anterior plane block (SAPB) is used to provide perioperative analgesia in unilateral chest wall surgeries. This technique works by blocking the lateral cutaneous branches of the intercostal nerves. Our hospital utilises a multidisciplinary rib fracture pathway that includes effective analgesia, chest physiotherapy and early referral to HDU/ICU to manage patients presenting with rib fractures. One of the analgesic techniques used includes the SAPB. This study aims to investigate the uptake of SAPB in patients presenting with rib fractures and their outcomes.

Methods: Patients presenting with rib fractures from January to December 2016 were identified using hospital coding system. Case notes were reviewed retrospectively and data was collected. We recorded age, hospital length of stay, number of broken ribs, HDU/ICU admission and analgesic regimen.

Results: In total, 26 patients were identified. Four patients were excluded due to unobtainable case notes. For the remaining 22 patients, median (range) age was 69 (30 – 88). Median (range) hospital length of stay was 6 (3 – 43) days. Nineteen patients suffered three or more rib fractures. Four patients were admitted to HDU, out of which two required antibiotics for pneumonia and none required mechanical ventilation. Fifteen patients received SAPB as part of their multimodal analgesic regimen.

Conclusions: Rib fractures are associated with high mortality and morbidity. Serratus anterior plane block is a simple yet effective technique that provides analgesia for the thoracic wall. We plan to introduce SAPB-for-rib-fractures charts to monitor patients’ pain scores and opioid requirements to better manage these patients.

Peripheral Nerve Blocks

ESRA7-0149

DURATION, EFFECTIVENESS AND FACTORS ASSOCIATED WITH LOWER LIMB BLOCKS – A PROSPECTIVE AUDIT

Armstrong M., McIvor C., and Dolan J. Glasgow Royal Infirmary, Anaesthetics, Glasgow, United Kingdom.

Background and Aims: Effective ankle and popliteal blocks enable many patients to be discharged on the day of surgery. A broadly accepted standard of analgesia for day surgery patients is that 95% should not experience severe pain in the first 48 hours post operatively. The majority of foot and ankle patients get a regional block. We audited adherence to this standard and looked at association with factors likely to contribute to analgesic efficacy.

Methods: Patients were phoned between 3 and 14 days after surgery. All were asked about when they first felt pain, how severe it was, sleep disturbance, medications they took in the first 48 hours and if they would recommend a block. Details of technique, perioperative medication, timings and analgesia were obtained from the electronic notes. Data analysis was in R and Excel 2011.

Results: After exclusions, there were 29 ankle blocks and 9 popliteal. T tests were performed. For popliteal blocks p=0.01 and for ankle blocks p=0.25. The dose of dexamethasone was 3.3mg in all but one case. No perineural adjuncts were added. There were non significant trends towards taking 10pm oral analgesia being associated with both increased duration of analgesia and less severe pain. Nearly a third of patients reported sleep disturbed by pain the first night. Even when blocks were ineffective patients would recommend regional analgesia and request it again.
Conclusions: This small number study supports iv dexamethasone as a powerful cheap widely accepted analgesic adjunct particularly in popliteal blockade, although not all are using it in our institution.

Peripheral Nerve Blocks

ESRA7-0289

ULTRASOUND GUIDED SUPERIOR LARYNGEAL NERVE BLOCK AS AN ADJUVANT TO GENERAL ANAESTHESIA DURING ENDOSCOPIC LARYNGEAL SURGERY: A RANDOMIZED CONTROLLED TRIAL

Arora S.1, Rupavath R. 2, Bhatia N. 3, and Bansal S.1 1Post Graduate Institute of Medical Education and Research, Anaesthesia & Intensive care, Chandigarh, India, 2Post Graduate Institute Of Medical Education & Research, Anaesthesia & Intensive care, Chandigarh, India, 3Post Graduate Institute of Medical Education and Research, Otolaryngology, Chandigarh, India.

Background and Aims: Direct rigid endoscopic surgery is frequently associated with postoperative complaints of cough, sore throat & hoarseness of voice. Methods used to decrease these complaints include use of endotracheal tube with low-pressure cuff, administration of lignocaine intravenously or into the endotracheal tube cuff and use of anti-inflammatory agents like steroids from various routes. However, the results of these studies are variable. Aim of this study is to evaluate the efficacy of ultrasound-guided block of the internal branch of superior laryngeal nerve on the incidence of postoperative cough, sore throat & hoarseness of voice.

Methods: Study Design: Prospective, double blind, randomized controlled trial. After institutional ethics committee approval and written informed consent, forty, ASA-I/II patients 18–65 years of age scheduled to undergo direct rigid endoscopic laryngosurgery under GA were randomized into two group.

- Group C (N=20): Patients received standard GA
- Group L (N=20): Along with GA patients received ultrasound-guided superior laryngeal nerve block bilaterally with 2.0 ml of 2% lignocaine

Results: We found a statistically significant less incidence of cough during extubation and in the immediate postoperative period up to 4 hours in patients who received bilateral superior laryngeal nerve block than control group. The incidence of postoperative sore throat and hoarseness of voice were also significantly less in group L than in the control group during first 24 hours.

Conclusions: USG guided SLN block as an adjuvant to GA for laryngosurgery resulted in significant reduction in postoperative cough, sore throat and hoarseness of voice with no increase in adverse events.

Peripheral Nerve Blocks

ESRA7-0189

FASCIA ILLIACA BLOCK (FIB): AN INEXPENSIVE METHOD OF PRE-OPERATIVE PAIN MANAGEMENT IN PATIENTS WITH A FRACTURED NECK OF FEMUR

Duggie A.1, Bashilyski V.2, Azad T.3 1County Durham and Darlington Foundation NHS Trust, Anaesthesia, Durham, United Kingdom, 2County Durham and Darlington NHS Foundation Trust, Anaesthesia, Durham, United Kingdom, 3County Durham and Darlington NHS Foundation Trust, Anaesthesia, STOCKTON-ON-TEES, United Kingdom.

Background and Aims: The fascia iliaca compartment block (FICB) was initially described on children using landmark technique and is now widely used in children and adults. It is a low-skill inexpensive method to provide analgesia in patients with painful conditions affecting the thigh, the hip joint and/or the femur. Hip fractures are common and the incidence is increasing because of the aging population. Systemic analgesics are often prescribed to relieve pain after hip fractures. These have significant side effects.

Methods: We retrospectively reviewed 50 consecutive patients after who had a fractured neck of femur comparing those who had a FICB to those who did not. We looked at mean pain scores prior to surgery, need for analgesia and opioid analgesia.

Results: Out of 50 patients only 14 patients had the FICB. Of 14 patients who had FICB, 13 patients had pain scores of 4 or less. 11 out of 14 of these patients did not need additional analgesia and none required morphine. Out of the 36 patients who did not have the block, 20 had a pain score 4 or less, all required analgesia with 21 patients out of 36 requiring morphine.

Conclusions: Fascia iliaca compartment block is an effective, easy to learn and inexpensive method of analgesia, which removes the need for opioid analgesia. We would recommend that all patients with a fractured neck of femur have a FICB on admission to hospital.
Results: 98% of patients were very satisfied with the pre-operative counseling and 100% agreed to have receive information about choices they had. 73% blocks done under ultrasound guidance by anaesthetist and 27% done under landmark technique by surgeons. Only 1% needed conversion to GA. Surgeon’s Perspective—89% were satisfied with the quality of regional/local anesthesia and 87% would want to use same anesthesia for the same procedure in the future. 97% of Anaesthetic nurses did not report added burden with the use of regional anesthesia. PACU—97% agreed that patients done under regional/local anesthesia reached discharge criteria earlier than GA.

Conclusions: The use of regional/local anaesthesia in hand surgery provides:
- Good outcome in terms of satisfaction with the quality of the perioperative care for both patients and surgeons.
- More efficient and effective use of the OT.

Peripheral Nerve Blocks

ESRA7-0226

INTRODUCTION OF A SIMULATION BASED TEACHING PROGRAMME FOR SERRATUS ANTERIOR PLANE (SAP) BLOCKS

Beard L., and Budd J. Hereford County Hospital, Anaesthetics, Hereford, United Kingdom.

Background and Aims: Serratus anterior plane (SAP) blocks can provide paraesthesia to the hemithorax and analgesia for up to 12 hours. The anaesthetic department at Hereford County Hospital wanted to introduce this relatively new block for the management of acute pain in patients with rib fractures because of its reduced side effect profile, relative ease of insertion and reduced requirement for post procedure monitoring when compared to paravertebral and epidural analgesia.

Methods: A training programme was required that could accommodate a varied skill and experience base and ensure that all anaesthetists undertaking on-calls could safely and competently perform the block.

Results: The traditional ‘see one, do one, teach one’ approach was not appropriate for our ‘students’, so we developed a programme that included simulation of the block to enhance acquisition of the essential skills necessary for this ultrasound guided block.

The teaching programme we developed featured:
- Demonstration of ultrasound anatomy on live model.
- Use of ultrasound phantoms to practice in plane ultrasound and needle technique. (Figure 1)
- Catalogue of ultrasound images from different patients to aid with recognition of anatomy. (Image 2)
- Supplementary reading material (available on trust intranet).
- Opportunity to perform SAP block on consented patients undergoing breast surgery.

Conclusions: Simulation in regional anaesthesia allows for hands on, repetitive experience, with immediate feedback and no risk of patient harm. Studies have shown that anaesthetists who have received training on proper ultrasound handling and needle coordination were more successful in block performance on real patients.

References:

Peripheral Nerve Blocks

ESRA7-0031

THANK GOODNESS FOR THE INTERSCALENE BLOCK - A CASE REPORT

Beh Z.Y.¹, Tham H.M.², Lim Y.C.³, and Lim N.L.² ¹Changi General Hospital, Anaesthesia & Surgical Intensive Care, Singapore, Singapore, ²Singapore, Singapore, ³Changi General Hospital, Singapore, Singapore.

Background and Aims: Phrenic nerve block resulting in ipsilateral hemidiaphragmatic paresis is a common side effect following interscalene
Brachial Plexus Block. Most cases of phrenic nerve block are transient and asymptomatic, especially in healthy individuals.

**Methods:** We report a rare incident of pulmonary embolism after a shoulder arthroscopic surgery in a 57-year-old healthy man. The patient had an interscalene block catheter inserted preoperatively under ultrasound guidance, using the in-plane approach and a bolus local anaesthetic (20 ml 0.5% Bupivacaine & 5 ml 1% lignocaine) was given. There were no immediate complications after the block. Surgery was performed under general anaesthesia. A perineural infusion of 0.2% Ropivacaine was commenced with 5 milliliters/hour post-operatively.

**Results:** On post-operative day 2, he developed acute dyspnoea when ambulating. His oxygen saturation was 70% on room air, which improved to 98% with 15 liters/minute oxygen via a non-rebreathing face mask. Chest radiograph (Fig 1A) showed an elevated right hemidiaphragm. Consequently, Ropivacaine infusion was stopped and perineural catheter removed, resulting in symptomatic improvement. The cause of dyspnoea was initially attributed to right phrenic nerve blockade. However, 12-lead electrocardiography (Fig 1B), computed tomography pulmonary angiography (Fig 1C) and Doppler ultrasound of lower limbs showed classical features of pulmonary embolism, multiple segmental pulmonary embolisms and a right soleal vein thrombosis respectively. Hence, the patient was started on anticoagulants and remained clinically well thereafter.

**Conclusions:** This report highlights the importance of excluding other causes of dyspnoea in patients who have a low risk of developing symptomatic PNB; and that interscalene block has unintended role of revealing otherwise asymptomatic lung pathologies.

**Peripheral Nerve Blocks**

**ESRA7-0173**

**TWO COMPETING METHODS TO FIND AN ALTERNATIVE TO THE INTERSCALENE BLOCK: ANTERIOR SUPRASCAPULAR/INFRACLAVICULAR VS POSTERIOR SUPRASCAPULAR/AXILLARY NERVE**

Bilstrand M., and Vagh F. University of New Mexico, Anesthesiology and Critical Care, Albuquerque, USA.

**Background and Aims:** In outpatient shoulder surgery we have noticed an increase in the BMI of patients. Many of these patients may not tolerate a unilateral phrenic nerve paralysis. Our goal of this project is to avoid phrenic nerve involvement that occurs with an interscalene block while also controlling pain.

**Methods:** We have developed two different methods for blocking patients for shoulder surgery with a BMI >30 and we compare these two approaches to determine which is easiest and provides the best pain relief without phrenic nerve compromise. The first method is to place an anterior suprascapular block combined with a costoclavicular infraclavicular block where the lateral and posterior cords are anesthetized.
The second method places an axillary nerve block combined with a postero-suprascapular block. We have three patients in each group.

**Results:**
In the first method, two of the patients expressed pain relief of 2/10. In both patients the suprascapular nerve was visualized under the omohyoid muscle and 2 ml of local were placed. The third patient in the group required a rescue block for pain in the suprascapular nerve distribution.

In the second method, in the first patient we couldn’t visualize either nerve to place the blocks. In the second and third patients, the patients stated 5/10 and 4/10 pain scores in the PACU.

**Conclusions:**
We have trialed two alternative ways to anesthetize the shoulder without phrenic nerve involvement. We found the anterior suprascapular/infraclavicular approach to be the easiest to place while also providing the most consistent pain control.

**Peripheral Nerve Blocks**

**ESRA7-0056**

**COMPARISON OF ANAESTHETICALLY-PLACED VERSUS SURGICALLY-PLACED NERVE CATHETERS FOR POST-OPERATIVE LOWER LIMB AMPUTATIONS**

**Buckley D.** Freeman Hospital, Anaesthesia, Newcastle Upon Tyne, United Kingdom.

**Background and Aims:** Pre-incision nerve catheters placed by anaesthetists using ultrasound or nerve stimulators for post-operative pain control for lower limb amputations are commonplace. However, if no suitably trained anaesthetists are present, surgeons insert nerve catheters under direct vision at the end of the procedure. To date, no comparison has been made between these two techniques in my institution to show which resulted in superior short-term pain relief.

**Methods:** Using our local pain database, information regarding pain scores in recovery (0 to 10), the duration of local anaesthetic infusion (hours) and the overall patient satisfaction (poor = 0, fair = 1, good = 2, excellent = 3) were obtained.

**Results:** Thirty-five patients had nerve catheters inserted for lower limb amputations in the past year. Anaesthetists placed 30 catheters pre-incision and surgeons placed 5 catheters under direct vision at the end of the procedure. The overall results show a surprising similarity in all the factors assessed. Comparing the nerve catheters placed by anaesthetists to those placed by surgeons, the average pain score in recovery was 2.0 vs. 2.5, the average time of local anaesthetic infusion was 6.7 vs. 6.44 hours and the overall patient satisfaction was 2.8 vs. 2.75.

**Conclusions:** The similarity in outcomes of these two types of techniques show that neither gives superior short-term outcomes when compared to the other. However, given that in the long term pre-incision blocks may reduce the occurrence of long-term phantom limb pain (Becott, et al., 2008), we should be looking to insert more pre-incision catheters.

**Peripheral Nerve Blocks**

**ESRA7-0147**

**HOW OFTEN DO CONTINUOUS PERIPHERAL NERVE BLOCKS PROVIDE 72 HOURS OF PAIN RELIEF**

**Buckley E., Burns M.** Phelps County Regional Medical Center, Anesthesiology, Rolla, USA.

**Background and Aims:** Peripheral nerve blocks are used to provide postoperative pain control. The choice of single injection versus continuous blocks...
remains disputed secondary to the questionable longevity of the catheters. Several studies have documented a great variation in the incidence of this complication, with a range quoted as low as 6.4% (Neuburger et al 2006) to as high as 17.9% (Capdevila et al 2005). The purpose of this study was to determine the overall incidence of complications requiring the removal of the catheter prior to the scheduled date.

**Methods:** A retrospective chart review of 176 charts was performed. All patients received ultrasound guided continuous brachial plexus blocks via interscalene approach with 5 ml bolus with 0.5% Ropivacaine then 5 ml/hr of 0.2% Ropivacaine by either one of two providers. All reasons for premature discontinuation was documented. All blocks were performed using Arrow 20 g StimuCath Kits AB-20608-KS and LMA autofuser pumps MT5060XL-CPNB Additional supplies for the dressing included a sterile single use mastisol by Eloquest, 3 M Tegaderm CHG securing dressing, and an Opsite Flexigrid by Smith&Nephew dressing.

**Results:** Out of the 176 patients reviewed, there were 19 (10.8%) documented premature catheter discontinuations. The most common reason for removal was due to accidental fall out with n = 9 (5.1%), 5 secondary to patient preference (2.8%), 3 related to shortness of breath (1.7%), 2 Horner’s Syndrome (1.1%), and 0 pump or tubing malfunctions.

**Conclusions:** Considering all complications requiring unscheduled removal of the catheters 89.2% remained in place until postoperative day three. Of these blocks 94.9% did not encounter a technical complication.

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**Peripheral Nerve Blocks**

**ESRA7-0108**

**BRACHIAL PLEXUS BLOCK TO DIAGNOSE SMALL VESSEL VASOSPASTIC DISEASE**

Cai Y. and Clendenen S. Mayo Clinic, Anesthesiology, Jacksonville, USA.

**Background and Aims:** Peripheral small vessel vasospastic disease can be devastating, resulting in pain, tissue ischemia, and loss of function. Regional nerve blocks have been shown by Doppler ultrasound to increase blood flow in medium to large sized vasculature, but there is no data on small vessels. We present a case of painful vasospasm in the hands undetectable by Doppler and ameliorated by brachial plexus block.

**Methods:** A 64-year-old female with a history of steatohepatitis, hypertension, and chronic kidney disease presented with one week of painful, cool, and cyanotic digits (Fig. 1). Doppler studies in both the venous and arterial phase were unremarkable, and the patient was started on aspirin, nifedipine, and topical nitroglycerin with no improvement. The patient underwent bilateral ultrasound guided supraclavicular catheter placement. A baseline arteriogram was obtained on the right side followed by a 15 milliliter bolus of 1.5% lidocaine through the catheter followed by arteriograms. This was replicated on the left side.

**Results:** On both sides, the blocks resulted in decreased pain and flushing in the upper extremities. Angiography indicated increased luminal diameter of vasculature (Fig. 2). Two months post-procedure, the patient continues on medical therapy with no pain and improved digital blood flow.

**Conclusions:** We report a diagnostic tool in distinguishing vasospasm versus an occlusive disorder of small vessels by correlation of a block and vasodilation demonstrated by angiography. This presents the possibility of regional anesthesia as part of the acute management of ischemia related to small caliber vasospastic disease.

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**Peripheral Nerve Blocks**

**ESRA7-0102**

**CONTINUOUS ADDUCTOR CANAL BLOCK AND INFILTRATION BETWEEN POPLITEAL ARTERY AND FEMORAL CONDYLES FOR TOTAL KNEE ARTHROPLASTY**

Background and Aims: Anesthesiologists have been looking for the perfect analgesia after total knee arthroplasty (TKA). The goal: no pain and no motor blockade. Many have been looking for continuous adductor canal block (ACB), minimizing quadriceps femoral motor block, associated with sciatic or a selective tibial block. Infiltration between popliteal artery and femoral condyles (IPACK) may be an alternative for analgesia of the posterior compartment.

Methods: 70-year-old female patient with history of arterial hypertension and dyslipidemia was admitted to a left TKA under subarachnoid blockade. We performed a single-shot IPACK (ultrasound-guided (US), 20 ml of Ropivacaine 0.2%, preoperative) and a continuous ACB (US, 20 ml Ropivacaine 0.2%, postoperative, perfusion 5.2 ml/h of ropivacaine 0.2% for 48 h). Additional analgesia: acetaminophen 1 g every 6 h and diclofenac 50 mg every 12 h.

Results: We tested both sensory and motor blockade (comparing both legs) as well as pain at the post-anesthesia care unit (PACU) arrival, 12 h, 24 h and 48 h after surgery. The patient reported no pain at rest or with movement in all observations except mild pain (numeric scale 2/10) in the upper pole of the knee cap at 48 h. Regarding sensory blockade, there was sensory block in saphenous and posterior obturator territories in all observations, with attenuation to touch, pinprick and cold sensation. There was no sensory blockade in sciatic territory. There was also a mild motor blockade of the quadriceps femoral comparing to the contralateral leg (muscle strength 4/5, being 5 normal strength). Active knee flexion approximately 90° after PACU arrival.

Conclusions: ACB with IPACK may be an excellent choice for TKA analgesia.

Peripheral Nerve Blocks

ESRA7-0072
SIDE-LINED BUT STILL RELEVANT: INTERPLEURAL NERVE BLOCKS FOR INTRA AND POST-OPE RATIVE ANALGESIA - A CASE SERIES
Chow S.Y. and Phoo J. Changi General Hospital, Department of Anesthesia and Surgical Intensive Care, Singapore, Singapore.

Background and Aims: Interpleural blockade is effective for in open upper abdominal, breast and thoracic surgeries, with a good safety profile. Recently, however, it became less popular with the rise of newer blocks. We hope to show it is still relevant in today’s practice as an effective and safe option for analgesia as part of a multi-modal plan.

Methods: Retrospective collection of descriptive data (ASA, gender, age, surgery performed, postoperative pain scores and time to first chest physiotherapy and deep breathing) was done. Patients were identified by searching through our department database. Their anaesthesia charts and hospitalisation records were reviewed.

Results: From 2015 to 2017, 8 patients, with mean age of 71 years, had an interpleural block performed by a single operator. Mean pain score on POD (postoperative day) 0 = 2.1 (median 2), POD 1 = 4.1 (median 4), POD 2 = 2.3 (median 2). Mean time to perform deep breathing = POD 1.6 (median 2), chest physiotherapy = POD 2.1 (median 2). All attempts administering the block were successful and there were no complications encountered.

Conclusions: Single shot interpleural block in our institution provides effective analgesia for intraoperative and the immediate postoperative period. In light of the higher POD 1 pain scores, we could consider inserting a catheter for continuous infusion through POD 1 and removing it on POD 2. The low number of blocks performed may mask the true incidence of complications; a larger number would have to be followed up to ascertain this.

Peripheral Nerve Blocks

ESRA7-0429
REGIONAL ANESTHESIA FOR THE AWAKE TRANS-SUBCLAVIAN TAVR
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1 Brigham and Women’s Hospital, Department of Anesthesiology-Periphe ral and Pain Medicine, Boston, USA, 2 Brigham and Women’s Hospital, Division of Cardiac Surgery, Boston, USA.

Background and Aims: Trans-subclavian access to trans-catheter aortic valve replacement (TAVR) is a safe approach for patients with iliofemoral arteriopathy. Perioperative risks are high as these patients often have multiple cardiovascular, respiratory and neurological comorbidities. Avoiding general anesthesia (GA) may reduce opioid consumption, lower complication rates, and shorten ICU and hospital stays.

Optimal neural blockade should provide surgical anesthesia of the upper chest wall, ipsilateral axilla and upper extremity with relative immobility over 3-4 hours, while sparing the respiratory muscles.

Methods: Twenty-six patients underwent trans-subclavian TAVR. As part of an evolving perioperative fast-track protocol, the first 21 received balanced GA. The subsequent 5 patients received regional anesthesia with a combination of brachial plexus block, Pecs I/II blocks, supracaucular nerves and intercostobrachial nerve blocks. Efficacy, perioperative analgesic use, complications, and length of ICU and hospital stays were assessed.

Results: No differences were observed in baseline characteristics between the GA and regional anesthesia groups. All 5 nerve block patients had effective surgical anesthesia requiring no long-acting opioids. One patient with severe lung disease experienced transientorthopnea; no other block complications occurred.

Postoperative opioids were required in 76% of GA patients on postoperative day (POD) 0 vs 20% of regional patients (p = 0.02). The postoperative complication rate in GA patients was 71% vs 20% in regional patients (p = 0.04). No difference was noted in POD 1 opioid use, ICU or hospital length of stay.

Table 1. Baseline Characteristics

<table>
<thead>
<tr>
<th>Age in yrs (SD)</th>
<th>General Anesthesia</th>
<th>Nerve Block</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>70.0 (7.20)</td>
<td>77.80 (6.06)</td>
<td>0.96</td>
<td></td>
</tr>
<tr>
<td>9/12</td>
<td>2/3</td>
<td>0.90</td>
<td></td>
</tr>
<tr>
<td>13/8</td>
<td>3/2</td>
<td>0.04</td>
<td></td>
</tr>
<tr>
<td>Gender M/F</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ASA Class III/IV</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

Table 2. Patient Outcomes

<table>
<thead>
<tr>
<th>Block complications (%)</th>
<th>General Anesthesia</th>
<th>Nerve Block</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>20.13 (24.58)</td>
<td>1 (26.9)</td>
<td>0.46</td>
</tr>
<tr>
<td>2</td>
<td>9.20 (7.52)</td>
<td></td>
<td>0.34</td>
</tr>
<tr>
<td>Length ICSI hrs (SD)</td>
<td>5.90 (4.9)</td>
<td>5.20 (2.86)</td>
<td>0.76</td>
</tr>
<tr>
<td>Opioid use POD 0 (%)</td>
<td>16/21 (76.13)</td>
<td>1 (20.0)</td>
<td>0.02</td>
</tr>
<tr>
<td>Opioid use POD 1 (%)</td>
<td>11/21 (52.38)</td>
<td>1 (20.0)</td>
<td>0.21</td>
</tr>
<tr>
<td>Opioid use POD 2 (%)</td>
<td>5/9 (55.6)</td>
<td>1 (20.0)</td>
<td>0.78</td>
</tr>
<tr>
<td>Opioid use POD 3 (%)</td>
<td>6/10 (60.0)</td>
<td>1 (20.0)</td>
<td>0.98</td>
</tr>
<tr>
<td>Postoperative complications (%)</td>
<td>15 (71.43)</td>
<td>1 (20.0)</td>
<td>0.04</td>
</tr>
</tbody>
</table>

Conclusions: We describe the first documented regional anesthesia for ‘awake’ trans-subclavian TAVR, a promising alternative to general anesthesia. Larger studies are needed to fully elucidate its efficacy and safety.
Peripheral Nerve Blocks

ESRA7-0252

BILATERAL PECS I AND DEEP SERRATUS ANTERIOR PLANE BLOCK FOR RARE MALE CARCINOMA BREAST

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Background and Aims: Pain relief is essential in post mastectomy patients. Reviewing literature, many drugs such as NSAIDS, anti-convulsants, anti-depressants, opioids and gabapentin have been used with limited success. Inadequate pain relief as an important factor in the development of post mastectomy pain syndromes. Male breast cancer accounts for less than 1% of breast cancers.

Methods: Patient was given bilateral PEC1-10 ml and deep Serratus anterior plane block with 0.2% ropivacaine in combinations with Inj Tramadol 75 mg i.v. and Inj Paracetamol 1gm i.v. after administering general anaesthesia.

Results: Bilateral PEC1 and deep serratus anterior plane block with 0.2% Ropivacaine provided analgesia for 25 hours. VAS 0/1/2 at 12 hours, 20 hours and 25 hours respectively. Surgical field is also clear.

Conclusions: Both blocks facilitated early recovery with good surgical field and rendered patient pain free and ambulatory within hours of surgery.

Peripheral Nerve Blocks

ESRA7-0086

IS LUMBOSACRAL PLEXUS BLOCKADE EFFECTIVE AND SAFE FOR SURGICAL ANESTHESIA IN TOTAL HIP REPLACEMENT? - A PILOT STUDY

Nielsen N.D.1,2, Rolighed Larsen J.2, Berglum J.3, Petersen J.A.K.4, Range C.1,2, Soballe K.1,3, and Bendtsen T.F.1,4,2 (Aarhus University, Dept of Clinical Medicine, Aarhus, Denmark, 3Regional Hospital Central Jutland, Elective Surgery Centre, Silkeborg, Denmark, 4Zealand University Hospital-University of Copenhagen, Dept. of Anesthesiology and Intensive Care Medicine, Roskilde, Denmark, 2Aarhus University Hospital, Dept of Anesthesiology and Intensive Care, Aarhus, Denmark, 3Aarhus University Hospital, Dept. of Orthopedic Surgery, Aarhus, Denmark.

Background and Aims: Patients scheduled for total hip replacement often present cardiovascular comorbidity, which increases peripertoperative risk of complications. This pilot study aimed to compare lumbosacral plexus blockade with continuous and single-dose spinal anesthesia for surgical anesthesia in total hip replacement. We hypothesized that lumbosacral plexus blockade induced the least hemodynamic impact.

Methods: Eight patients for elective hip replacement were included following informed consent. Hemodynamic impact was assessed using pulse contour analyses of the femoral artery pressure. Group 1 had lumbosacral plexus blockade (lumbar plexus block, sacral plexus block and fascia transversalis plane block) with ropivacaine. Group 2 had continuous spinal anesthesia with repeated bupivacaine-doses. Group 3 had single-dose spinal anesthesia with bupivacaine. Hemodynamic data were recorded during a 1-hour follow-up.

Results: All patients were ASA II and between 56-81 years of age. Two patients dropped out due to failure to insert a spinal catheter. We found no significant change in any hemodynamic parameters in group 1 and 2. The patient in group 3 showed significant decrease in systemic vascular resistance, and arterial and central venous pressures. (Table 1) No patients in group 1 achieved complete surgical anesthesia due to lack of anesthesia of the cranial part of the surgical incision.

Conclusions: Neither lumbosacral plexus block nor continuous spinal anaesthesia affected any hemodynamic parameters in this pilot study on patients without severe comorbidity. The utilized lumbosacral plexus blockade did not provide complete surgical anaesthesia for total hip replacement. Further studies are required to assess the hemodynamic effects of lumbosacral plexus blockade in patients with cardiovascular comorbidity.

Peripheral Nerve Blocks

ESRA7-0366

ADDUCTOR CANAL BLOCK COMBINED WITH ULTRASOUND GUIDED POSTERIOR AND ANTEROMEDIAL KNEE JOINT INFILTRATION WITH LOCAL ANAESTHETIC FOR ANALGESIA AFTER PRIMARY KNEE ARTHROPLASTY

Das D., Ernamdee R., and Nair R. Broomfield Hospital, Anaesthetic Department, Chelmsford, United Kingdom.

Background and Aims: Pain after primary knee arthroplasty is significant and good analgesia and early ambulation reduces morbidity and improves outcomes. Adductor canal block with ultrasound guided infiltration of the joint capsule provides good analgesia and early mobilisation with minimal quadriceps weakness while avoiding intrathecal opioids and urinary catheterisation. We audited this practice in our hospital.

Methods: Local audit committee approved this audit. Under midazolam sedation, a short-acting ultrasound-guided femoral nerve block (1% procaine) was done to facilitate the blocks for postoperative pain relief: an adductor canal block (0.375% ropivacaine; linear probe), followed by antero-lateral and posterior infiltration of knee joint with 0.2% ropivacaine (curvilinear probe). A 110 mm sono-enhanced needle was used for all blocks. Then, intrathecal anaesthesia was achieved with 0.5% heavy bupivacaine, without opioids.

Intra-operatively all patients received desamethasone, paracetamol, 75 mg of diclofenac (unless contraindicated) and 25 mg ketamine. All drug doses were weight-appropriate; total local anaesthetic doses were within safe levels.

Data on anaesthetic technique were collected prospectively and retrospectively on pain scores, morphine requirements and knee flexion in the immediate 48-hour period postoperatively.

Results: 15 patients were identified; see table for clinically significant findings.

Good analgesia was achieved immediately postoperatively (without intrathecal opioids), facilitating early physiotherapy. However, subsequent opioid use was not clinically significantly affected and may be similar to related techniques.
Conclusions: Preoperative ultrasound guided knee infiltration combined with adductor canal block has a role in multimodal post-operative analgesia for primary knee arthroplasty and can be beneficial in enhanced recovery pathways.  

PERIPHERAL NERVE BLOCKS

ESRA7-0294

THE MORPHEINE SPARING EFFECT OF TRUNCAL REGIONAL BLOCKS IN FREE FLAP RECONSTRUCTIVE SURGERY

Das D., Emanuelli R., and Nair R. Broomfield Hospital, Anaesthetic Department, Chelmsford, United Kingdom.

Background and Aims: The standard method of breast reconstruction following mastectomy in our institution uses a free DIEP (deep inferior epigastric perforator) flap (vessels, fat and skin) from the abdomen.

The usual perioperative analgesic technique for this extensive surgery includes simple analgesics, short acting opioids and morphine. However, the evolution of new truncal blocks has led one anaesthetist to use transmuscular quadratus lumborum blocks (QL block), unilateral pectoral nerve blocks (PECS I&II) and a serratus plane block (SPB). We present our initial interim results.

Methods: With audit committee approval, we retrospectively reviewed all patients (n = 17) who had the above block combination. We collected data on demographics, block done, intraoperative analgesia and postoperative analgesia in recovery, and then for the first 72 hours in ward.

Results: Five patients were identified. All patients had a TIVA anaesthetic. Immediately post induction they had ultrasound guided bilateral transmuscular QL blocks and unilateral PECS and SPB.

Analgesia given is described in the table below.

<table>
<thead>
<tr>
<th>Case number</th>
<th>Analgesia in Theatre</th>
<th>Maximum pain issues in recovery (0 to 10)</th>
<th>Analgesia in recovery</th>
<th>Regular analgesics to ward</th>
<th>Regular tramadol prescribed in the ward (72 hours)</th>
<th>Morphine in the ward (as required) (72 hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Paracetamol, diclofenac and ketorolac 100mg</td>
<td>2</td>
<td>Fentanyl 50mcg</td>
<td>Paracetamol and pregabalin</td>
<td>Not taken</td>
<td>Nil</td>
</tr>
<tr>
<td>2</td>
<td>Paracetamol, diclofenac and ketorolac 100mg</td>
<td>1</td>
<td>Fentanyl 50mcg</td>
<td>Paracetamol and pregabalin</td>
<td>Not taken</td>
<td>Nil</td>
</tr>
<tr>
<td>3</td>
<td>Paracetamol, diclofenac and ketorolac 100mg</td>
<td>1</td>
<td>Fentanyl 40mg</td>
<td>Paracetamol and pregabalin</td>
<td>Not taken</td>
<td>Nil</td>
</tr>
<tr>
<td>4</td>
<td>Paracetamol, diclofenac and ketorolac 100mg</td>
<td>1</td>
<td>Fentanyl 40mg</td>
<td>Paracetamol and pregabalin</td>
<td>150 mg</td>
<td>50mg</td>
</tr>
<tr>
<td>5</td>
<td>Paracetamol, diclofenac and ketorolac 100mg</td>
<td>0</td>
<td>None</td>
<td>Paracetamol and pregabalin</td>
<td>250 mg</td>
<td>Nil</td>
</tr>
</tbody>
</table>

Although only five patients, the fact that only minimal opioids were needed in our series is relevant. We surmise that this is due to the regional block combination used specifically to anaesthetise the abdomen and mastectomy site. We will continue our data collection and report further on this technique.

Conclusions: Appropriate truncal regional anaesthesia techniques may be helpful in reducing or completely removing the requirements for postoperative morphine in DIEP breast reconstructive surgery.

We encourage others to attempt this block combination and report their results.


Peripheral Nerve Blocks

ESRA7-0105

ANESTHETIC USE OF PECS II BLOCK ASSOCIATED WITH IORT (INTRA OPERATIVE RADIATION THERAPY): IS THIS THE FUTURE OF BREAST SURGERY?

Fuso P1, Ruotolo F2, De Divitiis D3, Scimia P3, De Sanctis F4, and Marinangeli F1, 5. San Salvatore Academic Hospital of L'Aquila, Department of Anesthesia and Intensive Care Unit, L'Aquila, Italy. 2. University of Campania "Luigi Vanvitelli", Anesthesia-Intensive Care and Pain Medicine Unit, Naples, Italy. 3. I.S.S.T. of Cremona, Department of Anesthesia and Perioperative Medicine, Cremona, Cremona, Italy. 4. University of L'Aquila, Department of Life-Health and Environmental Sciences, L'Aquila, Italy.

Background and Aims: Breast quadrantectomy is usually associated with IORT to provide a better oncologic outcome, but this management can prolong the surgical time with negative effects especially in high anesthetic-risk patients. The new blocks of thoracic wall provide a good analgesia and a good anesthetic plane.

Methods: A 60-year-old woman, ASA III, undergoing lateral quadrantectomy, sentinel lymph node biopsy and IORT for an invasive breast cancer. She was affected by ischaemic heart disease, hypertension, severe anxiodepressive syndrome, allergy to NSAIDs. We performed an ultrasound-guided PECS II block by injecting 0.5% ropivacaine 20 ml in the fascial plane between Pectoralis Minor and Serratus Anterior muscles at the level of 4th rib. An intraoperative sedation maintaining spontaneous breathing, with easy arousability, was ensured with TCI propofol (1.5-2.5 ng/ml) with 65-75 BIS-monitoring values. Supplemental oxygen (4 l/min) was administered by nasal cannula and ETCO2 was monitored.

Results: An appropriate anesthetic plane was achieved with PECS II Block only; the patient maintained a good hemodynamic stability and an excellent control of anxiety during the whole surgical procedure, which lasted 2 hours. She was monitored in the recovery room and reported a complete pain control without needing rescue analgesia. No opiates were required neither in PACU nor in the first 24 hours in the surgical ward.

Conclusions: This experience highlights how PECS II would be a opioid sparing technique and a feasible alternative to general anesthesia. It provided both a complete analgesia, even when surgical time was prolonged by IORT, and a good post-operative analgesia.

Peripheral Nerve Blocks

ESRA7-0264

DOES THE ADDITION OF LIPOSOME BUPIVACAINE IN ISBPB LOWER POSTOPERATIVE PAIN INDEPENDENT OF NUMBNESS, WEAKNESS OR LIMITED ACTIVITY LEVELS ADER ROTATOR CUFF

De Meirincsman S1, Max K2, Weyns M3, Willems T4, Byloos B5, Buck R6, Castermans T7, Louage S1, Van Boxstael S8, and Vandepitte C10,1, Kul leuven, Zol genk, Genk, Belgium, 2Zol genk, Anesthesia, Genk, Belgium, 3Uantwerpen, Zol genk, Genk, Belgium, 4Usavel, Hasselt, Hasselt, Belgium, 5Kul, Zol genk, Genk, Belgium, 6Zol genk, Zol genk, Genk, Belgium, 7Uantwerpen, Zol genk, Genk, Belgium, 8University of L'Aquila, Department of Life - Health and Environmental Sciences, L'Aquila, Italy.

Background and Aims: The novel drug delivery system of liposome bupivacaine can extend pain relief in the first postoperative week. This analysis evaluated whether patient reported pain relief conferred by liposome bupivacaine after surgery is confounded by their physical status with respect to numbness, weakness, and ability to use the shoulder.

Methods: Data from an Ethics Committee approved single-center, double-blind study were collected on pain and the presence/absence of numbness, weakness and low activity level of the shoulder in 40 patients having interscalene brachial plexus block (ISBPB) for rotator cuff repair. Patients were randomized to receive ISBPB with a mixture of 10 ml LB 1.33% and 5 ml Bupi 0.25% (LB + Bupi) or 15 mL Bupi 0.25% (Bupi alone). Postoperative time points were 36, 48, 72, 96 h and 7 d.

Results: Pain was reduced in the group receiving LB + Bupi compared to Bupi alone in the first postoperative week. However, presence/absence of numbness, weakness and low shoulder activity did not differ by group at any of the

TABLE 1.
The effect of liposome bupivacaine on postoperative pain.

CASE HISTORY: A 68 years old female was scheduled for left sided mastectomy for carcinoma. Patient had severe COPD with a FEV1 of 24% and FVC 48% predicted with 20 hrs of home oxygen 1-2litres/hr. Decision was made to avoid General Anaesthesia due to risk of respiratory depression and post-operative respiratory failure.

PROCEDURE: IV cannula inserted, AAGBI standards of monitoring established. Ultrasound guided Left Thoracic 2-6 intercostal nerve blocks medial to the left side. Pectoralis 1 and 2 block was done. 2 ml of a mixture of 1% Prilocaine and 0.5% Levobupivacaine for each intercostal level given. Pectoralis 1 and 2 block had 10 ml and 15 ml of the above mixture respectively. Remifentanil sedation at 1-2.0 ng/ml as a target control was provided. Ultrasound guided thoracic and parasternal block were performed. No significant haemodynamic alterations. The technique also provided a good-quality analgesia in breast surgery patients.

Conclusions: The results are shown in Table 1. Ultrasound guided thoracic and parasternal block provided an adequate anaesthetic technique alternative to general anaesthesia, paravertebral or epidural blocks have been described before. In patients with severe respiratory disease these techniques cause worsening of respiratory parameters as they can paralyse respiratory muscles bilaterally. Selectively blocking nerves innervating the breast can paralyse least number of respiratory muscles unilaterally and provide a good alternative to General anaesthesia, paravertebral or epidural blocks. A total of 183 responded. 40% were Consultants, rest being trainees. 35% did regional blocks on a regular basis i.e. few every week, 50% of the respondents say that they are aware of guidelines for above practice referring to AAGBI 2008 infection control in anaesthesia document.

Peripheral Nerve Blocks
ESRA7-0015
PECS II AND PARASTERNAL BLOCK FOR BILATERAL QUADRANTECTOMY AND AXILLARY SURGERY IN A HIGH ANESTHETIC-RISK PATIENT
Fusco P., de sanctis F., ruotolo F., scimia P., Di Carlo S., Degani G., and Marinangeli F. University of L’Aquila, Department of Anesthesia and Intensive Care- Unit- Sun Salvador Academic Hospital of L’Aquila- L’Aquila- Italy, L’Aquila, Italy; 2University of L’Aquila, Department of Life-Health and Environmental Sciences- University of L’Aquila- L’Aquila- Italy, L’Aquila, Italy; 3University of campania “Luigi Vanvitelli”, anesthesia- intensive care and pain management unit- Naples, Italy; 4A S.S.T. of Cremona, Department of Anesthesia and Perioperative Medicine- A S.S.T. of Cremona- Cremona- Italy cremona, Italy; 5University of Chieti- L’Aquila, Department of Anesthesia- Resuscitation- Intensive and Pain Care- University of Chieti- L’Aquila- Italy, chieti, italy; 6University of Chieti- L’Aquila, Department of Anesthesia- Resuscitation-Intensive and Pain Care- University of Chieti- L’Aquila- Italy, chieti- l’Aquila, Italy.

Background and Aims: The new blocks of chest wall such as PECS block, Serratus Plane block and Parasternal block, provide a valid analgesia in breast surgery operations. The same blocks could be an alternative to general anaesthesia using anaesthetic concentrations of LA, especially in patients with high perioperative risk.

Methods: We present the case of a 69-year-old patient affected by ischaemic heart disease, hypertension, severe COPD, chronic HBV-related epityphus, classified ASA 4, undergoing bilateral quadrantectomy and right axillary dissection. On the left breast we performed PECS 2 Block under ultrasound guidance by injecting 0.5% Levobupivacaine 20 ml between Pectoral Minor and Serratus Anterior muscles at the level of 4th rib. On the right breast, we performed both ultrasound-guided PECS 2 block at the same LA of the left side and Parasternal block by injecting Levobupivacaine 0.375% 5 ml at the level of 2nd rib and 5 ml at the level of 4th rib. Sedation was ensured with propofol 2-3 mg/ml and supplemental oxygen (3 lt/min) was administered. HR, MAP, SpO₂, ECoG, and BIS were monitored.

Results: An adequate anesthetic plan was obtained without significant haemodinamic alterations. The technique also provided a good-quality analgesia in the postoperative period without needing NSAIDs nor opiates.

Conclusions: The new blocks of the chest wall could be a suitable opioid sparing anesthetic technique alternative to general anesthesia particularly in patients at high anesthetic risk. The parasternal block provided an adequate anesthesia of the medial quadrant of the breast. Further studies are needed to confirm our results.

Peripheral Nerve Blocks
ESRA7-0043
CASE REPORT OF MASTECTOMY PRIMARILY UNDER INTERCOSTAL NERVE BLOCKS WITH PECTORAL 1 AND 2 BLOCKS
Dhanancheyan R., and Francis J. North Tees and Hartlepool Foundation trust, Anaesthetics and Intensive care, Stockton-on-Tees, United Kingdom.

Background and Aims: Regional anesthesia for mastectomy, with thoracic paravertebral and epidurals have been described before. In patients with severe respiratory disease these techniques cause worsening of respiratory parameters as they can paralyse respiratory muscles bilaterally. Selectively blocking nerves innervating the breast can paralyse least number of respiratory muscles unilaterally and provide a good alternative to General anesthesia, paravertebral or epidural blocks.

Methods: CASE HISTORY: A 68 years old female was scheduled for left sided mastectomy for carcinoma. Patient had severe COPD with a FEV1 of 24% and FVC 48% predicted with 20 hrs of home oxygen 1-2litres/hr. Decision was made to avoid General Anaesthesia due to risk of respiratory depression and post-operative respiratory failure.

PROCEDURE: IV cannula inserted, AAGBI standards of monitoring established. Ultrasound guided Left Thoracic 2-6 intercostal nerve blocks medial to the left side. Pectoralis 1 and 2 block was done. 2 ml of a mixture of 1% Prilocaine and 0.5% Levobupivacaine for each intercostal level given. Pectoralis 1 and 2 block had 10 ml and 15 ml of the above mixture respectively. Remifentanil sedation at 1-2.0 ng/ml as a target control was provided. Ultrasound guided thoracic and parasternal block were performed. No significant haemodynamic alterations. The technique also provided a good-quality analgesia in breast surgery patients.

Conclusions: The results are shown in Table 1. Ultrasound guided thoracic and parasternal block provided an adequate anaesthetic technique alternative to general anaesthesia, paravertebral or epidural blocks have been described before. In patients with severe respiratory disease these techniques cause worsening of respiratory parameters as they can paralyse respiratory muscles bilaterally. Selectively blocking nerves innervating the breast can paralyse least number of respiratory muscles unilaterally and provide a good alternative to General anaesthesia, paravertebral or epidural blocks. A total of 183 responded. 40% were Consultants, rest being trainees. 35% did regional blocks on a regular basis i.e. few every week, 50% of the respondents did a few every month. Only 6% of the respondents do complete surgical scrubbing and the rest, less than complete surgical scrubbing. Details on less than surgical scrubbing practices are as shown in the graph below. Only two respondents had encountered an infection related event in their life time. 7% of the respondents say that they are aware of guidelines for above practice referring to AAGBI 2008 infection control in anaesthesia document.
Conclusions: Four most common practices are washing hands with soap and water, wearing sterile gloves, using a sterile probe sheath, disinfecting skin with antisepic solution. Regional anaesthesia societies producing guidelines in this specific area with a solid evidence is highly recommended due to the very high number of peripheral nerve blocks done worldwide.

Peripheral Nerve Blocks

ESRA7-0104

ULTRASOUND LUMBAR PLEXUS BLOCK ASSOCIATED TO SACRAL PLEXUS BLOCK IN HIGH-RISK ELDERLY PATIENT AND DUAL ANTIPATELET THERAPY WITH HIP FRACTURE: A CASE REPORT

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Background and Aims: Hip fracture is a common problem in the elderly and the anesthetic management for the intervention can be challenging, particularly in patients with significant comorbidities that may contraindicate standard anesthetic techniques.

Methods: An 85-year-old patient with dementia, chronic ischaemic heart failure, chronic anaemia and hormonal due to hip fracture, on treatment with nitrates and dual antiplatelet therapy. The intervention was not suspended until the day of the intervention, underwent osteosynthesis of the femoral neck. Considering the clinical conditions and the therapy, we decided to perform the lumbar plexus block with Shamrock approach by injecting 15 ml of levobupivacaine 0.4% and the sacral plexus block with PSSP approach by injecting 10 ml of levobupivacaine 0.4% under ultrasound and neurostimulation guidance. Surgeons provided infiltration of the skin at the upper incision level. In the operating room, after monitoring of vital signs and EtCO2 curve, the patient received a sedation with 20 mg of ketamine and 1 mg of midazolam.

Results: The combination of these anesthetic techniques associated with sedation provided an adequate anesthetic plane to carry out the intervention. There were no significant hemodynamic changes and it was not necessary to resort to additional sedation. The patient also had an adequate post-operative analgesia without opioids or NSAIDs for the first 24 hours after surgery.

Conclusions: We believe that the combination of lumbar plexus block and sacral plexus block associated with an adequate analgesia can be a viable alternative to conventional anesthetic techniques in patients at high anesthetic risk and dual antiplatelet therapy.

Peripheral Nerve Blocks

ESRA7-0103

ANESTHETIC USE OF PECS II BLOCK AND PARASTERNAL BLOCK IN RADICAL MASTECTOMY WITH PROSTHESIS IMPLANT

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Background and Aims: The new blocks of the chest wall provide an excellent postoperative analgesia. Scientific literature reports experiences of anesthetic utilization of these techniques in interventions such as mastectomy or quadrantectomy in patients at high anesthetic risk. Whilst the positioning of the mammary prosthesis provides a better aesthetic outcome, this procedure may prolong the surgical time and increase the invasivity of the intervention.

Methods: A 65-year-old woman with intermedial operative risk for previous MI and COPD, underwent radical mastectomy with prosthesis implant. We performed an un-guided IL, PECS I and Parasternal Block with anesthetic concentrations by injecting levobupivacaine 0.5% 20 ml for PECS I at the level of 4th rib, 10 ml of levobupivacaine 0.375% for PECS I between pectoral major and minor muscles and for Parasternal block 10 ml between pectoralis major and intercostal muscles divided between 2nd and 4th rib. The patient was sedated with propofol 1-2 mcg/ml (TCI) and EtCO2 curve, respiratory frequency, SpO2, ECG and HR were monitored.

Results: We obtained an adequate anesthetic plane for the entire duration of the intervention, with hemodynamic changes < 5% throughout the procedure and without needing to resort to additional intraoperative analgesia. The patient had a good postoperative analgesia with NRS < 4 and paracetamol 1 g each 8 h as additional analgesia.

Conclusions: In our experience, the combination of these three techniques associated with sedation could be a suitable opioid sparing anesthetic plane alternative to general anaesthesia. Further studies are needed to confirm our results.
Identification and blockade of the ICBN/MCNoA is feasible during UGAB and can increase the anaesthetic coverage.

Peripheral Nerve Blocks

ESRA7-0258

SUPRASCAPULAR NERVE BLOCK ASSOCIATED WITH ADAPTED-PHYSIOTHERAPY IN THE MANAGEMENT OF FROZEN SHOULDER

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Background and Aims: The current ultrasound guided axillary block (UGAB) technique often misses the intercostobrachial nerve (ICBN) and the medial cutaneous nerve of the arm (MCNoA), resulting in an incomplete upper limb block. These nerves provide sensory innervation to the skin of the axilla and medial arm. Residual sensation to this area may become troublesome in surgery crossing the elbow or during surgery to the medial arm. Reliable anaesthesia in this area could reduce these problems, it may also help with reducing tourniquet pain.

Through cadaveric study and ultrasound examination we aim to gain a greater understanding of the course of the MCNoA/ICBN. This will then be utilised to identify these nerves at the level of an axillary block and include them to provide a more extensive block.

Methods: Three axillae were dissected in fixed cadavers to identify the distal course of the ICBN and MCNoA. Five male volunteers were scanned with ultrasound searching for these nerves. The distance of anaesthesia from the medial epicondyle of the humerus (ME) was assessed in ten patients receiving a standard UGAB technique and compared to twenty patients receiving UGAB including the ICBN/MCNoA.

Results: The MCNoA was identified medial to the plexus in all axillae. The MCNoA (4/5 volunteers) and the ICBN (3/5 volunteers) were identified on ultrasound. The MCNoA/ICBN were blocked in 14/20 patients and the distance of anaesthesia from the ME significantly increased (p = 0.0025) compared to a standard UGAB.

Conclusions: Identification and blockade of the ICBN/MCNoA is feasible during UGAB and can increase the anaesthetic coverage.

A SUCCESSFUL CASE OF CERVICAL SPONDYLOTIC RADICULOPATHY TREATED WITH ULTRASOUND-GUIDED ANTERIOR APPROACH TO CERVICAL NERVE ROOT BLOCK: A CASE REPORT

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Background and Aims: Cervical nerve root block (CRB) is widely performed to treat radicular pain. Recent advancements in ultrasound devices have led to the popularization of ultrasound-guided CRB. With the fluoroscopic-guided method, the drug solution flows from the intervertebral foramen into the epidural space, whereas with the current ultrasound-guided CRB (US-ACRB), the drug solution is administered further away from the intervertebral foramen peripherally. So we devised the ultrasound-guided anterior approach to CRB (US-ACRB), where the needle is positioned centrally, enabling the central spread of the drug solution. Here, we report our experience treating a case that could be managed well using this technique.

Methods: The patient was a 53-year-old man with shooting pain in the right upper extremity. He was diagnosed with cervical spondylotic radiculopathy. Using the conventional method, US-CRB was performed, but very little improvement was observed.

Results: Then, right C6 CRB was performed using our new method, and the subject’s pain remarkably eased. With our method, the anterior tubercle was anteriorly delineated, and the articular pillars posteriorly.Between them, a long narrowly depicted nerve root was observed. The needle was inserted parallel in the anteromedial–posterolateral direction, passed posteriorly to the nerve root, and advanced up to the anterior surface of the articular pillars. The accurate pathophysiology of frozen shoulder is still under investigation. Nonetheless, two consecutive phenomena are responsible for the disabling symptoms: synovial fluid inflammation and capsular fibrosis. This is clinically characterized by scapulalgia accompanied by joint stiffness which can last for months. There are some therapeutic approaches that can be useful to treat patients; oral steroids, IV steroids, rehabilitation, hydrolaxidation, manipulation under anaesthesia or arthroscopic surgery.

The aim of this case report is to evaluate the therapeutic approach that our team has developed with an innovative technique associating continuous suprascapular nerve block and rehabilitation.

Methods: A.A is a 31-year-old patient followed at the Pain Clinic (CHU of Liège, Belgium) for a 4-year left scapulalgia. He has undergone multiple surgeries for his condition without success, despite the absence of any surgical complications. According to a multidisciplinary approach and with the patient’s consent, the method chosen by our team was a ultrasound/neurostimulation-guided and MRI-controlled continuous suprascapular nerve block associated with adapted physiotherapy. The local anesthetic solution used was ropivacaine 0.2%, (PCEA: 6 cc/h + 3 cc/20 min bolus). During a 10-day hospitalization, the patient benefited of a 3 times/day physiotherapy sessions.

Results: Functional results (in degrees) on Figures 1, 2 (Active IR evolution: from hip to L4 in 9 months) and MRI-control on Figure 3

Conclusions: As far as we know, there are few studies describing the use of continuous suprascapular nerve blocks associated with rehabilitation showing a significant improvement in shoulder function in the case of long term frozen shoulder. This pioneering technique deserves further investigations by future studies.
Peripheral Nerve Blocks

ESRA7-0098

STOP BEFORE YOU BLOCK: A PATIENT SAFETY QUALITY IMPROVEMENT PROJECT

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Background and Aims: Wrong site peripheral nerve blocks should not occur. The National Patient Safety Agency (NPSA) classifies them as “Never Events”1. “Never Events are serious preventable incidents as recommendations that provide strong systemic protective barriers are available and should have been implemented by all healthcare providers”2. The Stop Before You Block (STOP) initiative was introduced to minimize the risk of an anaesthetist performing a wrong site block3. This project aimed to assess compliance with the STOP in our department.

Methods: Over a two-week period, we audited whether the STOP was recorded as complete prior to peripheral nerve blockade. This information was collected retrospectively from the operating room paperwork completed by theatre nurses at time of surgery.

Results: During the project 18 peripheral nerve blocks were performed. In 15 cases, the STOP was reported as complete. However, it was not in 3 cases, increasing the risk of a wrong site block. An educational session was held to highlight the consequences of a wrong site block and the success of the STOP initiative in minimising the risk of this. One month later the same data was collected. This time there was 100% compliance with the STOP (all 25 cases in a two-week period).

Conclusions: Wrong site peripheral nerve blockade can have disastrous consequences for a patient e.g. nerve damage, prolonged recovery. The STOP initiative has minimised the risks of this occurring. After educating our department, we showed an improvement in STOP compliance prior to peripheral nerve block, which will benefit patient safety.

Peripheral Nerve Blocks

ESRA7-0207

DOES THE ADDITION OF DEXAMETHASONE TO INTERSCALENE BLOCKS AFFECT POSTOPERATIVE PAIN SCORES AND STRONG OPIOID CONSUMPTION IN DAY-CASE SHOULDER SURGERY?


Background and Aims: Dexamethasone addition prolongs the duration of local anaesthetic blocks. This study aims to ascertain if dexamethasone addition reduces the severity of postoperative pain after block cessation and subsequent strong opioid requirements.

Methods: Over a twelve month period, 41 patients undergoing rotator cuff repair received interscalene blocks with 0.25% bupivacaine + 3.3 mg dexamethasone (Dexamethasone group, n = 20) or 0.25% bupivacaine (Bupivacaine group, n = 21). All patients had access to regular analgesics (paracetamol, NSAID, weak opioid) and strong opioids (oral morphine) following discharge. A telephonic survey was conducted to assess the severity of pain (scale 0-3) and the use of opioids.

Results: Patients in the Dexamethasone group had lower pain scores than the Bupivacaine group after block recession (1.3 vs 2.0). A smaller percentage of patients (25%) in the Dexamethasone group used stronger opioids as compared to the Bupivacaine group (80%). Despite the reduced use of strong opioids in the Dexamethasone group, the pain score was lower after analgesia.

Conclusions: Our study indicates that the addition of dexamethasone in some way modulates peripheral pain perception thereby reducing the magnitude of pain on block cessation and subsequent strong opioid requirements. This suggests that it may be particularly useful in day-case surgery.

Peripheral Nerve Blocks

ESRA7-0452

EARLY EXPERIENCE WITH THE ERECTOR SPINAE PLANE BLOCK FOR PAIN MANAGEMENT IN MULTIPLE RIB FRACTURES

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Background and Aims: We have previously reported successful use of the erector spine plane block (ESPB) using a continuous catheter technique, for pain management in multiple rib fractures (MRF)1. Here we report our early experience with this technique in 10 patients with MRF and discuss the lessons learned so far.

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Methods: We carried out a retrospective review of the medical records of the first 10 patients with MRF we treated using ultrasound guided ESPB catheters. All patients received 0.125% Bupivacaine at an infusion rate of 10-15 ml.h\(^{-1}\) in a ward setting.

Results: Results are shown in Figure 1.

FIGURE 1. Mean Pain Scores (0-10) for 10 patients with MRF prior to receiving ESPB (Day 0) and following ESPB (Days 1 to 6). The median length of hospital stay was 7 days. All patients received multimodal analgesia including oral morphine for breakthrough pain. No complications were reported.

Conclusions: ESPB requires less technical expertise to perform compared with some current methods. There is a learning curve for successful catheter placement. Our early experience suggest ESPB can be used safely in non-high dependency areas, facilitates early mobilization, is an important advance in the treatment of pain, and should prove cost effective in MRF. Further investigation of the efficacy of ESPB, and the development of protocols incorporating its use in MRF treatment algorithms is necessary. In conjunction with training of ward based staff this will reduce the need for concurrent opioid use.

Reference:

Peripheral Nerve Blocks

esra7-0022

BILATERAL ERECTOR SPINAE PLANE BLOCK FOR TREATMENT OF PAIN ASSOCIATED WITH MULTIPLE RIB FRACTURES

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Background and Aims: Multiple rib fractures (MRF) are common. They are associated with intense pain, and significant morbidity and mortality [1]. An 83 year old female sustained bilateral MRF in a motor vehicle accident. A computerised tomographic scan showed fractures of the right third to fifth ribs anteriorly, the left sixth to tenth ribs posteriorly, the lower sternum, and bibasal atelectasis.

Methods: Using a 1.6-6 MHz 38 mm linear probe in a parasagittal orientation, indwelling peripheral nerve catheters were placed in the erector spinae plane (ESP) bilaterally at the T5 level. The catheters were positioned deep (anterior) to the erector spinae muscles, then secured in place. An initial bolus of 20 ml 0.25% Levo Bupivacaine was injected through each catheter. The catheters were connected to a single infusion pump using Y connectors. 0.1% Bupivacaine was infused at 10 ml.h\(^{-1}\).

Results: The patient reported an immediate improvement in her pain. Within 10 minutes of block performance her numerical pain score decreased from 6/10 to 0/10 at rest. The patient felt her breathing had improved considerably and was able cough effectively. There was persistent but improved pain over the sternum. Formal testing with a cold stimulus demonstrated bilaterally reduced cold sensation from the T1-T12 dermatomes posteriorly, and the T1-T5 dermatomes anteriorly. The catheters were removed on Day 6 and the patient was discharged home safely.

Conclusions: The erector spinae plane block provides an effective alternative method of pain relief in MRF.

Reference:

Peripheral Nerve Blocks

esra7-0281

AN AUDIT OF ANALGESIA AFTER MASTECTOMY FOLLOWING INTRODUCTION OF SERRATUS PLANE BLOCK

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Background and Aims: We started using the superficial serratus plane block (SPB) for analgesia after breast surgery in 2016 and wanted to assess its efficacy and place within mastectomy surgery. SPB was introduced by Blanco in 2013 and is one of many regional anaesthetic techniques for breast surgery.

Methods: After obtaining local audit department approval, we reviewed case notes from 17 patients undergoing mastectomy (without reconstruction) from September 2016 – April 2017. Opioid doses in the perioperative period (Intra-op and in recovery) and post-operative (first 24 hours or until discharge) were converted to intravenous morphine equivalents (IME).

Results: 5 patients had received SPBs under ultrasound guidance with 40 ml (or maximum of 0.8 ml/kg 0.25% levobupivacaine) immediately after induction of general anaesthesia. No complications from the block were found. 2 patients with SPB required no strong opioid in either the perioperative period or first 24 hours.

TABLE 1.

Anechoitally it is evident intra-operatively that axillary lymph node sampling or clearance is not covered by the SPB, however additional infiltration by the surgeon can provide analgesia here.

Conclusions: SPB appears safe, is easy to learn and perform and is associated with reduced opioid requirement in the immediate peri-operative period and for up to 24 hours.

Future work should focus on – patient satisfaction scores & investigation of whether regional anaesthesia improves chronic pain rates. Alternative blocks such as Pecs II may be superior for reconstruction surgery and could be considered in those cases.

Peripheral Nerve Blocks

esra7-0170

OVER COMING A "NEVER EVENT", A COMPLETED AUDIT CYCLE OF "STOP BEFORE YOU BLOCK"

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Background and Aims: “Stop before you block” (SB4YB) originated in the United Kingdom after episodes of wrong sided blocks. The SB4YB campaign has been widely adopted throughout regional anesthesia and is part of patient safety culture. In 2015/16 wrong sided block was classified as a “never event” by NHS improvement. We were unfortunate enough to have two wrong sided blocks in a 12 months. We aimed to identify the reasons for this and reduce further occurrences.

Methods: An audit of regional anesthetics and compliance with SB4YB was undertaken, after which an educational campaign was initiated. In addition a new question about unilateral regional anesthetic was added to the WHO sign in. A repeat audit was performed to assess the success of this, thus completing the audit cycle.

Results: The first audit showed 70% compliance rate with SB4YB. SB4YB was initiated by the primary anesthetist 41%, secondary anesthetist 38%, anesthetic assistant in conjunction with the anesthetist 12% and by the anesthetic assistant alone in 9% of cases respectively.
Repeat audit showed a 97.8% compliance rate. Initiation of SB4YB was by the primary anesthetist 33.3%, secondary anesthetist 17.7%, anesthetic assistant in conjunction with the anesthetist 11.1% and the anesthetic assistant alone in 35.5% of cases respectively.

Conclusions: It is possible with education/awareness campaigns aimed at the theater team as well as the medical team to improve SB4YB compliance and thus improve patient safety. We believe that the increase in compliance was primarily due to the increased initiation of SB4YB by the anesthetic assistant and use of a new WHO sign in.

Peripheral Nerve Blocks

ESRA7-0312

MIDDLE CHILD SYNDROME: THE NERVE(S) THAT IS COMMONLY OVERLOOKED DURING PLACEMENT OF AN INTERSCALENE NERVE BLOCK

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Background and Aims: The rising incidence of rotator cuff repair surgery has increased the utilization of interscalene nerve blocks (ISB) for perioperative pain management. Despite early publications indicating the potential for transecting the dorsal scapular nerve (DSN) and long thoracic nerve (LTN) during placement of the ISB, a significant lack of awareness exists amongst regional anesthesia clinicians. In this paper, we aim to identify and confirm the location of the DSN and LTN.

Methods: Five patients were consented for placement of an ISB for shoulder surgeries. After positioning the patient 30 degrees supine, ultrasound imaging (GE Logiq E, L38 probe, Wauwatosa, WI, USA) was used to identify the interscalene brachial plexus. A 22 g, 8 cm stimulating needle (Pajunk Stimuplex, Geisingen, Germany) was advanced in plane, from a lateral to medial direction through the middle scalene muscle toward the plexus. Electrical nerve stimulation (Stimuplex

Conclusions: The case series demonstrates that it is common for the needle trajectory to pierce through the DSN (Figures 1, 2). Less commonly, injury to the LTN can occur during placement of this nerve block (Figure 3).

Discussion: Patients with underlying DSN syndrome should be considered relative contraindications to placing an ISB because this may worsen their underlying syndrome. We recommend obtaining a specific history and physical regarding pre-existing pain prior to placement of an ISB.

Peripheral Nerve Blocks

ESRA7-0220

PECTORAL NERVE BLOCK FOR MASTECTOMIES: WORTH THE EFFORT?

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FIGURE 1.

FIGURE 2.

FIGURE 3.
**Background and Aims:** Pectoral nerve block (Pecs) is an interfascial plane block introduced by Bianco et al. (2011) to provide analgesia for breast surgery. Since 2015 Pecs were introduced in AZ Delta Roeselare, Belgium as an adjuvant local anesthetic technique for breast surgery under general anesthesia. The aim is to retrospectively compare the quality of analgesia and opioid consumption after mastectomy with Pecs added to general anesthesia with a control group who only received general anesthesia.

**Methods:** A monocenter study including 41 patients who underwent a mastectomy with Pecs (n = 20) was compared to a retrospective control group (n = 21) who only received general anesthesia. Ropivacaine 0.5% 30 ml was used as local anesthetic. Outcomes were per- and postoperative opioid consumption and postoperative pain scores in the first 24 h recorded at the PACU, after 12 and 24 hours on the ward.

**Results:** Patient demographics, duration of anesthesia and PACU time for both groups were comparable. There was a significant lower postoperative piritramide consumption in the Pecs group (median = 0.0 mg; IQR = 0.0-3.8 mg) compared to the non-Pecs group (median = 0.0 mg; IQR = 15.22 mg) (p < 0.001). Perioperative fentanyl consumption was significant lower in the Pecs group (median = 100 μg; IQR = 68.8-131.3 μg) compared to the non-Pecs group (median = 150 μg; IQR = 150-175 μg) (p < 0.001). NRS scores (numeric rating scale) were comparable in both groups, with a tendency towards lower NRS Scores in the Pecs group.

**Conclusions:** These results indicate that Pecs decrease per-and postoperative opioid consumption in the first 24 hours after mastectomy. Pain scores were lower in the Pecs group, although not statistically significant.

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**Peripheral Nerve Blocks**

**ESRA7-0299**

**AUDIT OF ANALGESIC EFFICACY OF CONTINUOUS ADDUCTOR CANAL BLOCK (ACB) IN TOTAL KNEE REPLACEMENT (TKR) AND ARTHROSCOPIC ANTERIOR CRUCIATE LIGAMENT (ACL) RECONSTRUCTION SURGERY**

**Methods:** In one year 101 patients who received ACB were included in this audit. All the data was collected from the intra-operative anaesthetic records and records maintained by pain nurses. 25 patients undergoing unilateral TKR and 25 undergoing bilateral TKR received continuous ACB infusions for first 48 hours. 17 patients who had ACL reconstruction received continuous infusion and 9 were given single shot ACB. Paracetamol 1g was regular post-operative analgesic. Diclofenac and tramadol were written as rescue analgesics. Time taken by patients to start mobilize after TKR surgery was also noted.

**Results:** In this audit continuous ACB was an effective analgesia technique as a part for multimodal post-operative analgesia for TKR and ACL reconstruction surgeries. Analgesia was achieved in 99.01% patients with regular paracetamol and diclofenac, tramadol as rescue analgesics. 69.3% patients did not require rescue analgesia. 1 patient needed morphine PCA and was counted as failure of ACB. Continuous ACB facilitated early ambulation for TKR surgeries as there was no obvious motor weakness or incidence of fall.

**Conclusions:** In our audit Continuous ACB provided effective opioid sparing analgesia for TKR and ACL reconstruction surgeries. It was also motor sparing nerve block that did not prevent early mobilization in TKR surgeries. To test statistical significance of this conclusion a prospective study needs to be done.

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**Peripheral Nerve Blocks**

**ESRA7-0380**

**PUDENDAL NERVE BLOCKS IN MEN UNDERGOING ANTERIOR URETHROPLASTY: A CASE SERIES**

**Background and Aims:** Despite the “Stop Before You Block” (SBYB) campaign, wrong sided blocks continue to occur, with 27 wrong sided blocks recorded between April 2016 and February 2017 in the UK. We believe an audio cue at the time of needle insertion could decrease the likelihood of wrong sided blocks. We also believe that a method of measuring injection pressures could be incorporated into the same device.

**Methods:** We have developed, coded, built and tested an Arduino(®)-based device which is attached to a block needle. We have utilised open-source resources (in line with Jugaad principles) and coded the device to our requirements, to issue a final audio reminder to ‘Stop Before You Block’ at the crucial point of the procedure, as the needle touches the skin. We have also added an injection pressure measuring device within the same prototype.

**Results:** The device has undergone a first wave of testing with separate volunteers using the device on different areas of the body to simulate the block process. It was triggered in 100% of cases indicating a high degree of reliability. We have also calibrated the pressure sensor and reliably indicates injection pressures <15 psi, 15-20 psi and >20 psi via a series of graded LEDs.

**Conclusions:** The addition of an inexpensive purpose-built device to prompt user application of the SBYB principles and measure injection pressures could improve the safety of peripheral nerve blocks. Further testing and refinement is needed to help standardise its use. We invite people to try the device.
Two patients reported well-controlled perineal pain at 24 hours post-operatively. One patient reported moderate perineal pain requiring additional analgesia. All patients were discharged on postoperative day 1 without complications.

Conclusions: This, to our knowledge, is the first description of pudendal nerve blocks providing effective postoperative pain control in men undergoing anterior urethroplasty.

Peripheral Nerve Blocks

ESRA7-0152

ANESTHETIC MANAGEMENT OF GRAFT SURGERIES USING PERIPHERAL NERVE BLOCKS AND PERIOPERATIVE MEASUREMENT OF PERFUSION INDEX: 2 CASE SERIES

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Background and Aims: The outcomes of reconstructive surgeries using vascular grafts may improve by keeping blood flow of the surgical sites. Here we report two cases where we used peripheral nerve blocks for such surgeries and measured the blood flow to the extremity of the operated side using the Perfusion Index (PI) by Radical 7 (MASIMO®).

Methods: The 1st case was an 18-year-old female who underwent vascularized bone graft, which was one part of proximal phalange of index finger, implantation to her right wrist for Kienböck’s disease. Before induction of general anesthesia, subclavicular brachial plexus block was performed with 0.16% levobupivacaine 15ml. Infusion of 0.06% levobupivacaine at 4 ml/hr was continued until postoperative day (POD) 3.

The 2nd case was a 61-year-old male who underwent extensive tumor resection of his right shoulder and reconstruction with latissimus dorsi flap. Before induction of general anesthesia, interscalene brachial plexus block was performed with 0.25% levobupivacaine 20ml, Infusion of 0.1% levobupivacaine 4ml/hr was continued until POD 3.

Results: In both cases, PI measured on the index finger of the operated side in the same condition. These two groups were compared for pain with visual analogue scale (VAS). Postoperative VAS and morphine consumption values were recorded at 4, 8, 12, 24, 48, and 72 hours.

Conclusions: Brachial plexus block may increase the blood flow to the extremities by sympatholysis and may contribute to the survival of the graft.

Peripheral Nerve Blocks

ESRA7-0188

QUADRATUS LUMBOUM BLOCK III FOR POSTOPERATIVE PAIN AFTER PERCUTANEOUS NEPHROLITHOTOMY

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Background and Aims: Effective pain control after percutaneous nephrolithotomy operations is important for early mobilization and return to normal life conditions. Intraoperative local anesthetic use or postoperative analgesic use has been reported for pain control in the percutaneous nephrolithotomy. The transmuscular quadratus lumborum block (QLB III) is a regional analgesic technique that performing with ultrasound. Our aim is observation of the effect of QLB III on postoperative pain after percutaneous nephrolithotomy.

Methods: This prospective, randomized, double-blinded study was conducted between December 2016 and March 2017. Forty-four patients who were American society of Anesthesiologist physical status 1 or 2, and scheduled for elective percutaneous nephrolithotomy under spinal anesthesia were enrolled in this study. They were randomly assigned to receive a QLB III (n: 22) with 0.0125% bupivakain 0.2 ml/kg (group Q) or a QLB III (n:22) with 0.9% normal saline 0.2 ml/kg (group S). Postoperative morphine patient-controlled analgesia (PCA) were used via vein (1mg each attempt, lock time 15 minutes). Postoperative pain levels were monitored with visual analogue scale (VAS). Postoperative VAS and morphine consumption values were recorded at 4, 8, 12, 24, 48, and 72 hours.

Conclusions: In percutaneous nephrolithotomy operations, it was observed that QLB III block was effective in controlling analgesia and reducing morphine consumption in the postoperative 48 hour follow-up.

Peripheral Nerve Blocks

ESRA7-0027

THE COMPARISON OF POSTOPERATIVE EFFECTS BETWEEN ADDUCTOR CANAL BLOCK AND FEMORAL NERVE BLOCK IN TOTAL KNEE ARTHROPLASTY: A SIMULTANEOUS BILATERAL RANDOMIZED STUDY

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Background and Aims: Femoral nerve block (FNB) has been used as part of the multimodal analgesia after total knee arthroplasty (TKA), but leads to weakness in the quadriceps muscles. Recently, adductor canal block (ACB) was reported to provide effective pain relief while sparing the strength of the quadriceps. This simultaneous bilateral randomized study investigated whether patients perceived differences between ACB and the FNB after same day bilateral TKA.

Methods: We performed a prospective simultaneous bilateral randomized study in 50 patients scheduled to undergo same-day bilateral TKA. One knee was randomly assigned to ACB and the other was to FNB. All blocks were performed using ultrasound guided single-shot procedures in the same condition. These two groups were compared for pain with VAS, straight leg raising (SLR) ability and knee extension while sitting, and motor grade in each time period. At postoperative week 1, the peak torque for the quadriceps muscle was measured in both knees with an isokinetic dynamometer.

Results: There were no differences in pain levels between ACB and FNB during the entire period. During the first 48 hours after TKA, more of the knees that received ACB could perform SLR and knee extension with greater quadriceps strength compared with FNB. However, no group differences in quadriceps functional recovery were found after postoperative 48 hours and isometric quadriceps strength at postoperative 1 week.

Conclusions: This simultaneous bilateral randomized study demonstrates that patients did not perceive differences in pain level, but experienced substantial differences in quadriceps strength recovery between knees during the first 48 hours. (Identifier: NCT02513082).
Peripheral Nerve Blocks

ESRA7-0412

OPERATION SPECIFIC POSTOPERATIVE ANALGESIA: DO ANAESTHETISTS NEED TO REFRESH KNOWLEDGE?

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Background and Aims: Ultrasound allows real time visualisation of nerves but a sound knowledge of anatomy and nerve distribution is needed to decide appropriate nerve blocks. We conducted this survey on qualified anaesthetists who had passed formal examinations in the UK (primary and final FRCA) to assess their retention of relevant anatomy.

Methods: A web based survey was conducted at a UK teaching hospital. Information was requested on seniority, number of blocks performed per year and choice of peripheral nerve blocks for common upper limb surgeries for postoperative analgesia. Pictures were provided with a marked line of incision to assist their decision.

Results: Table 1 shows a summary of received responses.

<table>
<thead>
<tr>
<th>Total number of responses</th>
<th>32</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consultants</td>
<td>21</td>
</tr>
<tr>
<td>Specialty Registrars</td>
<td>11</td>
</tr>
<tr>
<td>Number of blocks per year</td>
<td></td>
</tr>
<tr>
<td>0-10</td>
<td>10</td>
</tr>
<tr>
<td>10-100</td>
<td>19</td>
</tr>
<tr>
<td>&gt;100</td>
<td>3</td>
</tr>
</tbody>
</table>

Table 1: Summary of responses

Figure 1 shows the choice of peripheral nerve blocks for postoperative analgesia for Dupuytren’s fasciectomy of middle ring and little fingers of palm, open reduction and internal fixation of 4th and 5th metacarpal and distal volar radial plate for wrist fracture. 26.7% of respondents chose an unnecessary nerve block for postoperative analgesia such as lateral cutaneous nerve of arm block for Dupuytren’s fasciectomy of palm of hand.

Conclusions: This survey demonstrates the need for periodic reinforcement of neuro-anatomy for regional anaesthesia to prevent unnecessary nerve blocks and associated potential nerve damage. We plan to present and use this data as an educational tool in our department.

Peripheral Nerve Blocks

ESRA7-0408

MULTIPLE SCLEROSIS(MS) AND PERIOPERATIVE NERVE BLOCKADE - SYSTEMATIC REVIEW

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Background and Aims: Multiple sclerosis (MS) is one of the common chronic, immune mediated demyelinating disorders with a preponderance towards female population. Here we made an attempt to analyse the literature to create a systematic review with regards to nerve blockade (central and peripheral) and its effects in patients with MS.

Methods: Search for randomised controlled trials (RCTs) and case-series studies were carried out using MEDLINE, EMBASE and cochrane CENTRAL trials register. RefWorks system was used to de-duplicate the studies collected.

Results: Eight RCTs were found of which 5 were decided to be of inadequate strength to analyse further and there were no strong case series reports found to be added to the study. Mentionable findings from the study were

1. With regards to central neuraxial blockades (NAB) low dose epidural is considered safer as compared to spinal anaesthesia (Bajaj et al). Spinal anaesthesia is considered to be a relative contra-indication (Cimenti et al.)
2. Lumbar plexus blocks and para-vertebral blocks were noted to have prolonged duration in patients with MS.
3. Peripheral nerve blocks were found to be relatively safer as compared to central NABs (Schneider 2005).

Conclusions: 1. Despite strong evidence spinal is better avoided. Low dose epidurals are relatively safer in such situations which warrant central NABs.
2. It should be borne in mind that some plexus blocks such as the para-vertebral can have prolonged duration in patients with MS.
3. PNBS are relatively safer though the anaesthetist should keep in mind that 5% of patients with MS will have peripheral nerve involvement. In all cases detailed discussion and meticulous documentation should be present.

Peripheral Nerve Blocks

ESRA7-0109

CAN PECTORAL NERVE (PECS) BLOCK PROVIDE BETTER POSTOPERATIVE ANALGESIA IN BREAST SURGERY? - A RETROSPECTIVE STUDY

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Background and Aims: Pectoral nerve (Pecs) block is a recently introduced technique for postoperative analgesia in breast surgery. However, there are few studies reporting patient-reported effectiveness of this technique. Thus, we conducted a study to evaluate the effectiveness of Pecs block for postoperative analgesia.

Methods: We retrospectively reviewed the records of 50 patients who underwent breast surgery under PECS block combined with general anaesthesia (PB+) group, and other 41 patients with general anaesthesia alone (PB− group). Pecs block was performed with single-injection of 30 ml of 0.375% ropivacaine.
Primary end-point was Verbal Rating Scale of pain (VRS: 1; none, 2; mild, 3; moderate, 4; severe) at postoperative 1 and 24 hours. Secondary end-point was the interval between the end of the operation and the first rescue analgesia.

Results: The majority of patients in both groups showed mild or no pain at postoperative 1 hour (Figure 1). The median value of VRS at 1 hour in PB+ group was 1, which was the same as in PB- group (Mann-Whitney U test, P = 0.19). The effect was similar at 24 hours (P = 0.47) (Table 1). The median interval to the first rescue analgesia in PB+ group was 16 hours (Figure 2), which was 1 hour shorter than PB- group, but the difference was not statistically significant (Mann-Whitney U test, P = 0.63).

Conclusions: Pecs block does not reduce immediate postoperative pain measured by VRS in breast surgery.

Peripheral Nerve Blocks

ESRA7-0371

RETROCLAVICULAR APPROACH VS CORACOID APPROACH FOR INFRACLAVICULAR PLEXUS BLOC OF THE UPPER LIMB: A NON-INFERIORITY MULTI-CENTRIC RANDOMISED CONTROLLED TRIAL

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Background and Aims: The coracoid approach is a simple approach to perform ultrasound-guided infraclavicular block (USGIB), but needle visualization is difficult. We hypothesized that retroclavicular approach was not longer to perform than the coracoid approach but improved needle visualization.

Methods: We recruited patients in 3 canadian academies centres. Adult patients (≥18 years old), undergoing distal upper limb surgery were eligible. We excluded patients with contraindications to regional anesthesia, pregnancy or anatomical deformation. Patients received USGIB with either coracoid or a retroclavicular approach. The primary outcome was performance time, defined as visualization plus needle time, and was analyzed with a non-inferiority test of averages. Depth of sensory of motor blockade, surgical success, total anesthesia time, needle visualization, number of needle passes and complications were evaluated as secondary outcome and were analysed using superiority analysis. Pre-defined subgroup analysis restricted to patients with higher body mass index (BMI) was completed.

Results: After regional ethic board approval, 113 patients were randomized. Retroclavicular performance time did not reach statistical significance in the non-inferiority analysis, but was found to be at most 5.8% longer (retro: 267s; coracoid 287s, 95%CI 256-321; p=0.06). Retroclavicular approach conferred an ultrasound-needle angle closer to 90° and significantly improved needle visualization at insertion (p=0.001) and immediately before local anesthetic administration (p=0.001). No differences between groups existed regarding other secondary outcomes. In the subgroup analysis, needle angle and visualization remained the only improved outcome.

Conclusions: Retroclavicular approach shortly statistically failed to demonstrate non-inferior performance time to coracoid approach, but significantly improved needle visibility.
Conclusions: When used appropriately as a combination of skilled operator, appropriate technique and equipment, and optimal dosing, RA can safely deliver superior analgesia when compared with opioid analgesia.

This spot survey demonstrates the potential application of RA in the intensive care setting. Seven out of forty-four (15%) of patients in this sample could potentially have benefited from a RA procedure.

Peripheral Nerve Blocks

ESRA7-0097

AN AUDIT OF REGIONAL ANAESTHESIA IN CLAVICLE FIXATION SURGERY

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Background and Aims: Selection of the correct regional block for clavicle surgery is often difficult as a single block may not provide adequate anaesthesia or analgesic coverage due to the dual sensory innervation in this region from the cervical and brachial plexuses. This is further compounded by the differences in dermatomal and sclerotomal innervation. We audited the use of regional blocks in our institution, as well as the post-operative pain relief and development of complications.

Methods: Adult patients who underwent clavicle fixation surgery from August 2015 to April 2017 were identified from the electronic medical records database of a tertiary hospital. Patients who underwent multiple surgical procedures in the same sitting (including bone grafting) as well as those who had other sources of significant pain were excluded.

Results: A total of 44 patients underwent clavicle fixation surgery, of which 31 fulfilled inclusion criteria. 17 patients received general anaesthesia (GA) alone. Of those who received GA alone, all except 5 patients had local anaesthesia (LA) infiltration by the surgeons. 14 patients received regional anaesthesia (RA) in combination with GA, and none of the included cases were performed under RA alone. No major complications from RA were reported. Patients who received RA had lower pain scores in the post-anaesthetic care unit compared to those who did not although pain scores were similar from the first post-operative day.

Conclusions: Peripheral nerve blockade may help improve pain scores in the early post-operative period following clavicle fixation surgery compared to general anaesthesia alone although further study is required.

Peripheral Nerve Blocks

ESRA7-0251

SUCCESSFUL REPOSITIONING OF THE SUTURE-METHOD CATHERET FOR CONTINUOUS BRACHIAL PLEXUS BLOCK: PRESENTATION OF THREE CASES

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Background and Aims: Advancement and final positioning of perineural catheters may be difficult and possibilities for repositioning are limited. We describe the use of a novel suture-method catheter for brachial plexus block in three cases and successful repositioning after displacement of the catheter.

Methods: The suture-method catheters were placed at the superior trunk of the brachial plexus for postoperative pain control after major shoulder surgery. We inserted the catheters using an in-plane, short-axis technique. The curvature of the needle and expected trajectory both towards and away from the plexus was considered.

Two patients presented with moderate to severe pain in the evening on first postoperative day due to catheter displacement. A third patient was examined immediately after surgery and spread from injection through the catheter was assessed to be inadequate. In each case, the position of the catheter orifice was confirmed by ultrasound visualization and injection of local anaesthetic. This enabled repositioning by pulling either end of the catheter.

Results: We successfully repositioned the catheters in all patients. Subsequent injection of local anaesthetic resulted in immediate pain relief for the two cases presenting with moderate to severe pain and ultimately sustained pain relief in all cases.
Our survey identified several gaps in training as well as some opportunities. As a result, we are designing a structured teaching program which would ensure our fellows receive training in less frequently performed blocks.

Peripheral Nerve Blocks

ESRA7-0331

INTERSCALENE BRACHIAL PLEXUS IN A PATIENT WITH MADELUNG’S DISEASE: ULTRASOUND MADE IT POSSIBLE

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2 Hospital de Braga, Anaesthesiology, Braga, Portugal.

Background and Aims: Interscalene brachial plexus blocks are an important part of the peri-operative treatment in shoulder surgery. Madelung’s Disease is characterized by benign, non-encapsulated accumulations of fat in a symmetrical manner, primarily in the neck and shoulder regions. Patients present a difficult airway and abnormal anatomy that may be challenging for loco-regional anaesthesia, specifically for interscalene brachial plexus blocks.

Methods: We report a case of a 57-year-old male, with dilated cardiomyopathy, left ventricular systolic dysfunction, chronic obstructive pulmonary disease and Madelung’s Disease, admitted for surgical treatment of a proximal humerus fracture.

Preeanaesthetic evaluation revealed a IV Mallampati score, restricted neck mobility, and multiple fat accumulations in the upper trunk and neck. Results: Patient was monitored according to ASA standards, depth of anaesthesia and invasive blood pressure monitoring. An interscalene brachial plexus block was performed using 0.5% ropivacaine (15mL).

An awake fiberoptic intubation was done and a total intravenous anaesthesia was performed with propofol-remifentanil and neuromuscular blockade with rocuronium. Intravenous paracetamol 1g was administered. Reversal of neuromuscular blockade with sugammadex was done at the end of the procedure. Surgery and immediate postoperative period was uneventful. Patient was discharged from hospital 48 hours after the procedure.

Conclusions: Our survey identified several gaps in training as well as some opportunities. As a result, we are designing a structured teaching program which would ensure our fellows receive training in less frequently performed blocks.

Peripheral Nerve Blocks

ESRA7-0326

WHEN REGIONAL ANAESTHESIA SAVES THE DAY… AND THE PATIENT

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Background and Aims: Trauma is an important public health problem. We present a case of a severe trauma patient who underwent several surgical procedures after a work accident.

Methods: A 26 years old male, ASA II, was hospitalized due to severe trauma of both legs and lumbar spine. He underwent emergent surgery to correct an exposed fracture of the left leg under general anaesthesia. Following this procedure, neuraxial anaesthesia was unadvisable (spinal immobilization), and a difficult airway and abnormal anatomy that may be challenging for loco-regional anaesthesia, specifically for interscalene brachial plexus blocks. Surgery for correction of right tibia and fibula fractures was scheduled. For this procedure, neuraxial anaesthesia was unadvisable (spinal immobilization), and general anaesthesia could be dangerous (unclear respiratory pathology).

Results: We performed ultrasound-guided blocks of femoral, lateral femoral cutaneous and sciatic (subgluteal level) nerves with 175mg ropivacaine. Anatomical changes characteristic of Madelung's Disease make it impossible to identify anatomical landmarks, increasing the risk of technical failure, vascular puncture or nerve damage. In this case, only the use of an in-plane ultrasound guided technique allowed successful execution of the interscalene plexus block. The patient was deemed as having a difficult airway, and an awake fiberoptic intubation was planned and used successfully.
Preoperatively, bilateral ultra-high frequency ultrasound (70 MHz) images of the distal median nerves at the wrist were obtained. Intra-operatively the brachial plexus was examined placing the ultra-high-frequency ultrasound probe directly on the roots as they exited the neural foramina to evaluate for degree of nerve avulsion from the spinal cord and for feasibility of nerve transfer.

Results: The ultra-high-frequency appearance of the distal median nerve fascicles on the affected side was contracted compared to the contralateral side (Figure 1). In addition to confirmation of C7 avulsion, an avulsion of C5 (Figure 2) was discovered and confirmed with absence of somatosensory evoked potentials when stimulated, a diagnosis not originally made on MRI. It was therefore felt that the best manner to proceed would be to perform a spinal accessory nerve to suprascapular nerve transfer as well as intercostal nerve transfers to the biceps branch of the musculocutaneous nerve.

**FIGURE 1.**

**FIGURE 2.**

Conclusions: We were able to clearly observe individual fascicles of the median nerve. The limitation of the 70 MHz probe is the maximum depth is 1 centimeter. Ultra-high frequency Ultrasound technology can be used as an adjunctive tool to directly visualize and diagnose peripheral nerve neuropathology.

Methods: In 2012, we developed our own in-house training using our machines, training facilities and theatre staff as models. We initially identified six trainers, six models and 18 consultant delegates. Six training stations were set up; 3 upper and three lower limb. Delegates through these stations at 20 minute intervals. Success of this initial venture was the catalyst as to whether we would continue.

After the course, feedback was obtained, to use as a basis for future courses.

Results: All participants rated the stations as good or very good. 12 candidates used this course as a basis of doing more, different blocks.

The success of this course meant that more courses were organised. We have run the course for six years.

The course was free, delegates just paid for the meal.

At least 12 of the consultants now teach ultrasound at regional and national courses.

More complex blocks and spinal scanning have been successfully introduced on a phased basis, based on need and requirements of the consultants.

Conclusions: The in-house nature of the course, the familiarity of the participants results in better interaction and better learning outcome. Consequently, out of three hospitals, we still do the most regional blocks in our region.

Development of regional anaesthesia training is achievable at low cost. We encourage others to use our example and report their results.
Peripheral Nerve Blocks

ESRA7-0377

PECORAL NERVES BLOCK FOR BREAST AUGMENTATION SURGERY USING BUPIVACAINE 0.25% IN ONE BREAST AND SALINE IN THE OTHER: A RANDOMIZED BLINDED AND PLACEBO CONTROLLED TRIAL

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Background and Aims: Pectoral nerves blocks (Pecs) are increasingly used to provide analgesia after breast surgery. However, breasts receive additional innervation from thoracic, and cervical plexus. The ability of Pecs blocks to provide significant analgesia, in spite of this complex innervation, is an area of controversy. We conducted this placebo controlled trial to study the analgesic efficacy of Pecs blocks after breast augmentation surgery.

Methods: Twenty female patients were enrolled in the study. After induction of general anesthesia, all patients received ultrasound guided Pecs I&II blocks using 20ml and 10ml of 0.25% bupivacaine respectively in one breast (treatment group). However, the other breast received saline (placebo control group). Random allocation was used to choose the breast that received LA. Anesthetists, patients and assessors were blinded to the treatment group. Each patient was asked to rate the pain in each breast at recovery unit, 6, 12, 24h (primary outcome). Intraoperatively, the changes in heart rate (HR) in response to skin incision and implant insertion were recorded.

Results: The treatment group showed significantly lower pain scores at recovery unit (4.9±2.2 vs. 6.5±2.1p=0.03), after 6h (3.1±1.5 vs. 4.7±1.8p=0.01), 12h (2.1±0.9 vs. 3.4±1.5p=0.004), & 24h (1.7±0.9 vs. 2.7±1.2p=0.02). No difference in HR rise in response to skin incision (13.1%±12 vs. 10.7%±8.7 for placebo vs. 0.67). However, significantly lower HR rise to implant insertion was detected in treatment group (1.7%±1.9 vs. 6.1±2.7p=0.001). No complications were recorded.

Conclusions: Pecs I&II blocks provided effective analgesia after breast augmentation that lasts up to 24h. However, pecs blocks failed to blunt the hemodynamic response to skin incision. Furthermore, the degree of pain after Pecs I and II blocks ensure the need of multimodal analgesia.

Peripheral Nerve Blocks

ESRA7-0187

SENSORY DISTRIBUTION OF LATERAL FEMORAL CUTANEOUS NERVE BLOCK – A RANDOMIZED, BLINDED, PAIRED TRIAL IN HEALTHY VOLUNTEERS

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Background and Aims: The lateral femoral cutaneous nerve (LFCN)-block may be used for postoperative pain management in patients undergoing total hip arthroplasty (THA). The aim of this study was to investigate the distribution area of the LFCN-block in relation to the posterior and anterolateral THA incision lines, and the affection of the femoral nerve.

Methods: The study was a randomized, paired, blinded trial in twenty healthy volunteers. All subjects received a bilateral LFCN-block randomized to 8 ml ropivacaine on the right side and 8 ml saline on the left side, or vice versa. An orthopedic surgeon depicted the incision lines (invisible for the investigators) prior to block performance. The distribution of the blocked area, and the coverage of the incision lines were assessed with temperature discrimination and pin-prick test before unblinding the incision lines. Pain during tonic heat stimulation and affection of the femoral nerve by measuring quadriceps strength were assessed.

Results: The median difference in block coverage of the posterior (primary outcome) and the anterolateral incision lines tested with temperature discrimination were 0.0% (95% CI: 0.0-2.3, p=0.109) and 16.5% (95% CI: 0.0-24.0, p=0.008) respectively, comparing the active and placebo side. A varying anatomic distribution area was observed. No clinically significant differences for experimental pain and quadriceps muscle strength were found. The non-responder rate was 15%.

Conclusions: LFCN-block consisting of 8 ml 0.75 % ropivacaine has limited coverage of the posterior and anterolateral incision lines due to a varying anatomic distribution area.

Peripheral Nerve Blocks

ESRA7-0076

AN AUDIT OF BRACHIAL PLEXUS BLOCKS FOR UPPER LIMB SURGERY IN AN ASIAN TERTIARY CENTRE

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Background and Aims: The brachial plexus block (BPB) is can be a superior alternative to general anaesthesia (GA) for upper limb surgery, especially for patients with co-morbidities or airway difficulties. Vasodilatation from BPB benefits patients who undergo revascularization surgery. Post-operative recovery time is shorter and opioid use is lower. Our centre recommends BPB because of these advantages, high success rates and low complication rates as described in the literature. All our BPBs are done in-plane, ultrasound-guided by trainee and specialist anaesthetists.

We aim to review and present our experience for BPBs in an Asian tertiary centre.

Methods: We conducted a single centre 6-year retrospective audit of patients who underwent upper limb surgery (excluding shoulder and clavicle surgery). Review of the electronic anaesthetic records were used. Failure of BPB was defined as the need for intravenous ketamine or conversion to GA.

Results: Of 2045 cases, 93% of BPBs were successful as the sole anaesthetic. Failed blocks were due to incomplete coverage, and were rescued with inner venous ketamine or converted to GA. 42.8% of BPBS could be rescued solely with intravenous ketamine. 50.7% were converted to GA without attempting intravenous ketamine. No complications were reported.
Conclusions: The BPB is performed to a high rate of success in our centre, in congruence with current data. Even with incomplete coverage, almost half of these blocks could be rescuable with intravenous ketamine alone. This validates the BPB as an effective and safe option despite being performed by practitioners of various experience.

Peripheral Nerve Blocks

ESRA7-0351

ULTRASOUND-GUIDED (USG) BLOCKS FOR BREAST CANCER SURGERY – A CADAVERIC STUDY COMPARING MULTI-INJECTION THORACIC PARAVERTEBRAL BLOCK (TPVB) WITH THE NOVEL MULTI-INJECTION COSTOTRANSVERSE BLOCK

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Background and Aims: USG multi-injection TPVB is currently the regional anaesthesia golden standard for breast cancer surgery. Multi-injection TPVB reduces both acute and chronic pain as well as postoperative opioid consumption. Recently, a novel single-injection Erector Spinae Plane Block (ESPB) has been demonstrated to alleviate thoracic neuropathic pain. We have modified the ESPPB to a novel multi-injection Costotransverse Block in the thoracic paravertebral area. Hypothesis: Multi-injection Costotransverse Block would result in a blockade of the ventral rami and the thoracic sympathetic trunk similar to the TPVB without risking epidural spread and pleural puncture. Aim: Demonstrating injectate spread pattern following multi-injection Costotransverse Block compared to multi-injection TPVB.

Methods: Four ml 1% Methylene blue was injected bilaterally at five levels (Th2-Th6) in five soft-embalmed cadavers. Left/right for the two techniques was randomly allocated. The needle was always advanced in-plane with the parasagittal ultrasound beam between two transverse processes. Needle insertion was caudad-cranial and penetrating the superior costotransverse ligament perpendicularly with the multi-injection TPVB. Needle insertion was cranial-caudad and parallel and superficial to the superior costotransverse ligament with the multi-injection Costotransverse Block.

Results: Multi-injection Costotransverse Block stained the ventral rami Th1-7, the communicating rami and the thoracic sympathetic trunk without any epidural spread. Dye spread occurred via the costotransverse foramina. Multi-injection TPVB exhibited similar positive results but spread to the posterior epidural space in 80% of cases.

Conclusions: Multi-injection Costotransverse Block spreads via the costotransverse foramina to surround the ventral rami, the communicating rami and the thoracic sympathetic trunk without any epidural spread.

Peripheral Nerve Blocks

ESRA7-0394

THE LATERAL FEMORAL CUTANEOUS NERVE - DESCRIPTION OF THE SENSORY TERRITORY AND A NOVEL ULTRASOUND GUIDED NERVE BLOCK TECHNIQUE

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Background and Aims: Proximal branches of the lateral femoral cutaneous (LFC) nerve innervate incisional areas in relation to hip surgery. Ultrasound guided (USG) LFC nerve block techniques are based on either compartmental spread deep to the iliac fascia or alternatively by selectively targeting the LFC nerve on the anterior surface of the sartorius muscle. The former technique causes cooncomitant femoral motor paralysis and the latter is technically challenging and reduces success rate. Distal to the inguinal ligament, the LFC nerve runs in a fat-filled fascial canal (FFC) between the sartorius and tensor fascia lata muscles. Our aim is to investigate the effect and feasibility of a novel USG nerve block technique injecting into the FFC.

Methods: Twenty healthy volunteers were included in a triple-blind randomized trial conducted over two consecutive days. On day one, all subjects received a novel USG LFC nerve block injecting into the FFC. Local anaesthetic and placebo was randomised between sides in each subject. The primary endpoint was successful anaesthesia of the skin innervated by the proximal LFC branches, defined by the anaesthetised area of the SI-FIC block.

Results: Anaesthesia of the lateral thigh was successful in 94.7% with active block and in 0% with placebo, p<0.001. Mean block procedure time was 3.4 minutes. The proximal branches were anaesthetised in 68.4%, p<0.001.

Conclusions: USG LFC nerve block in the FFC is a quick and feasible technique.
Peripheral Nerve Blocks

ESRA7-0200

COMPARISON OF LOW-DOSE SPINAL ANESTHESIA AND ADDUCTOR CANAL BLOCK COMBINATION WITH CONVENTIONAL DOSE SPINAL ANESTHESIA IN OUTPATIENT ARTHROSCOPIC KNEE SURGERY

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Background and Aims: There are many pain modalities which are effective and frequently used in management of pain following arthroscopic knee surgery but most of them have several adverse effects.

In the current study, we aimed to compare low dose spinal anesthesia-adductor canal block(SA) combination with conventional dose spinal anesthesia(S) in terms of intraoperative anesthesia characteristics, block recovery characteristics and postoperative analgesic consumption.

Methods: In the present retrospective, cohort study, data of 48 patients was collected from hospital medical records between October 2016 and April 2017. Intraoperative hemodynamic variables, time to reach sensorial block of T12 and maximum level of motor block and time to reach maximum motor block level, sensory block regression to L2, complete motor block recovery were recorded. Postoperative pain scores at rest and during flexion and postoperative analgesic consumptions were recorded. Adverse effects were also recorded.

Results: Demographical characteristics were similar in both groups. Visual Analog Scale (VAS) for pain was significantly high at 1th hour in SA group whereas it was high at 4th and 12th hours in S group. In all other measurement points, VAS was similar in both groups. Total opioid consumption was higher in S Group. But opioid-related adverse effects such as nausea and vomiting were similar.

Conclusions: In the current study, it has been demonstrated that low dose spinal anesthesia combined with adductor canal block provides adequate anesthesia with lower pain scores and less analgesic consumption.

Peripheral Nerve Blocks

ESRA7-0132

INTERSCALENE BRACHIAL PLEXUS BLOCK: THE “SAFE” VOLUME

Pascarella G., Costa F., Del Buono R., Piliègo C., Schiarioni L., Sarubbi D., and Agò F.E. Campus Bio-Medico University, Anaesthesia and Intensive Care, Roma, Italy.

Background and Aims: Interscalene brachial plexus block is the most used regional anesthesia technique in shoulder surgery. Incidence of hemi-diaphragmatic paralysis is estimated to be more than 90% with standard dosage (at least 20 ml), though data about recommended standard volumes are discordant. We tried to make this block safer, evaluating the analgesic effect and unilateral diaphragmatic paralysis incidence with different volumes in patients undergoing shoulder arthroscopy.

Methods: This study obtained ethics committee approval. We performed a single-shot ultrasound-guided BPB between C5-C6 roots. Ten patients (group H, high volume) received 0.2 mL/kg of ropivacaine 0.75%, ten patients (group L, low volume) received 0.1 mL/kg. Patients were evaluated in the first 30 minutes post-BPB for onset and efficacy of sensitive and motor block, and for diaphragmatic movements (ultrasound evaluation). During surgery, patients were sedated with propofol TCI maintaining spontaneous breathing. Postoperative pain and analgesic consumption were recorded.

Results: Onset time of BPB was faster in group H, although a complete motor and sensitive block was observed in both groups within the first 30 minutes. (Fig.1)

Block efficacy was the same in the two groups, with a shorter duration in group L (Tab. 1)

Nevertheless, this difference did not affect postoperative pain and total analgesic consumption. (Tab. 2)

In group H, 9 patients developed diaphragmatic paralysis, in group B just one out of 10 patients (p=0.001).

TABLE 1. BPB Features and Outcomes

<table>
<thead>
<tr>
<th></th>
<th>H</th>
<th>L</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injected Volume (Mean ± SD), ml.</td>
<td>15 ± 3.3</td>
<td>7.4 ± 1.4</td>
<td>-</td>
</tr>
<tr>
<td>Time of execution (Mean ± SD), sec</td>
<td>69 ± 3.4</td>
<td>67.2 ± 5.3</td>
<td>0.26</td>
</tr>
<tr>
<td>Efficacy at 30 min (% of patients)</td>
<td>100%</td>
<td>100%</td>
<td>-</td>
</tr>
<tr>
<td>Diaphragmatic paralysis at 30 min (% of patients)</td>
<td>90%</td>
<td>10%</td>
<td>0.001*</td>
</tr>
<tr>
<td>Intensive analgesic consumption (yes/no)</td>
<td>no</td>
<td>no</td>
<td>-</td>
</tr>
<tr>
<td>Analgesic consumption in PACU (yes/no)</td>
<td>no</td>
<td>no</td>
<td>-</td>
</tr>
<tr>
<td>Block duration (Mean ± SD), h</td>
<td>9 ± 0.7</td>
<td>8 ± 1</td>
<td>0.03*</td>
</tr>
</tbody>
</table>

H: High Volume; L: Low Volume

TABLE 2. 24 h Postoperative Analgesia

<table>
<thead>
<tr>
<th></th>
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<th>L</th>
<th>p</th>
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</thead>
<tbody>
<tr>
<td>Numerical (NRS maximum) (Mean ± SD)</td>
<td>3.6 ± 1.6</td>
<td>3.4 ± 1.3</td>
<td>0.77</td>
</tr>
<tr>
<td>Morphine (CI) (Mean ± SD), mg</td>
<td>10 ± 0</td>
<td>10 ± 0</td>
<td>-</td>
</tr>
<tr>
<td>Morphine on demand (Mean ± SD), mg</td>
<td>0 ± 0</td>
<td>0 ± 0</td>
<td>-</td>
</tr>
<tr>
<td>Ketorolac (CI) (Mean ± SD), mg</td>
<td>90 ± 0</td>
<td>90 ± 0</td>
<td>-</td>
</tr>
<tr>
<td>Acetaminophen on demand (Mean ± SD), g</td>
<td>0.8 ± 0.8</td>
<td>1 ± 0.7</td>
<td>0.54</td>
</tr>
</tbody>
</table>

H: High Volume; L: Low Volume

TABLE 3. Continuous Infusion

<table>
<thead>
<tr>
<th></th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>CI: Continuous infusion</td>
<td>-</td>
</tr>
</tbody>
</table>

TABLE 3. Continuous Infusion

Conclusions: The “safe” volume for interscalene BPB showed to be 0.1 mL/kg. With this volume, homolateral diaphragmatic paralysis is significantly less frequent and block efficacy is not affected.

Peripheral Nerve Blocks

ESRA7-0342

INADVERTENT MOTOR BLOCKADE IN TIBIAL AND COMMON PERONEAL NERVE DISTRIBUTION FOLLOWING ADDUCTOR CANAL BLOCK FOR ACL REPAIR


Background and Aims: Adductor canal block (ACB) has recently emerged as an alternative to femoral nerve block for pain control after various surgical procedures of the knee including knee arthroplasty, arthroscopy and anterior cruciate ligament (ACL) reconstruction. We report a case of motor popliteal blockade (tibial and common peroneal nerve) following an ACB for ACL reconstruction.

Methods: A 21 year old female medical student was operated for ACL reconstruction under general anaesthetic and an ACB. The block was performed with
20mls of 0.175% Levobupivicaine under ultrasound guidance. Patient had good sensory blockade in the saphenous nerve distribution. However, in the postoperative period, the patient reported weakness of dorsi and plantar flexion of the foot. Clinical examination also revealed sensory loss in the popliteal distribution. Quadriceps function remained intact. The patient was admitted for observation. Patient regained full motor power 12 hours after the procedure and sensation in 20 hrs. She was then discharged the following day after commencing physiotherapy.

**Results:** Our patient developed transient blockade of the common peroneal and tibial nerve. We believe that this was due to the local anaesthetic as there was complete recovery in 20 hours. A proportion of local anaesthetic might have travelled into popliteal compartment leading to blockade of the nerves here.

**Conclusions:** We recommend limiting the volume of local anaesthetic used for adductor canal block to decrease the chance of spread into popliteal compartment. We also recommend warning patients about possible risk of motor blockade while obtaining informed consent for an adductor canal block.

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**Peripheral Nerve Blocks**

**ESRA7-0175**

**PROXIMAL SPREAD OF LOCAL ANAESTHETIC IN ADDUCTOR CANAL, MEASURED WITH ULTRASOUND**

Wilson A., Leeds Teaching Hospitals NHS Trust, Anaesthetic Department, Leeds, United Kingdom.

**Background and Aims:** Adductor canal block (ACB) has recently gained popularity for ambulatory knee surgery by blocking the saphenous nerve and other genicular branches without a motor block. To this aim many practitioners only use 10 mls to minimise spread outside of the true ACB. The extent of spread is however to date undocumented.

**Methods:** We audited patients who required an ACB and measured an immediate proximal spread of Local Anaesthetic (LA) in the canal using an ultrasound.

Adductor canal was scanned prior to the procedure. We followed SFA (Superficial Femoral Vein) down until the lateral border of Sartorius muscle no longer covered the artery (the end of the adductor canal) and injected 1ml above from this point. Proximal spread was measured immediately following injection of 10 mls of LA by two independent assessors.

15 patients were included in the audit.

**Results:** The proximal spread of LA in adductor canal ranged between 3.5 cm-17 cm.

We did not observe any LA in femoral triangle following injection of 10 mls. It appears in this small audit that there is no correlation between spread height, gender and BMI.

**Conclusions:** In our audit 10 mls of LA would have an unpredictable spread within adductor canal proximally and distally, but never reach a femoral triangle.

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**Peripheral Nerve Blocks**

**ESRA7-0218**

**STERNOTOMY REVISION UNDER PECS BLOCK AND CONSCIOUS SEDATION: A TWO-CASE-REPORT**


**Background and Aims:** Since the PECS and the serratus plane blocks were first introduced, their application was mainly confined to breast surgery and not the breast only, where general anesthesia or deep sedation wants to be avoided.

**Results:**

**FIGURE 1.**

Conclusions: The cases described suggest the role of the parasternal PECS in surgical procedures involving the sternal area and not the breast only, where general anesthesia or deep sedation wants to be avoided.

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**Peripheral Nerve Blocks**

**ESRA7-0423**

**ULNAR NERVE ENTRAPMENT, WITH AN UNUSUAL ENTRAPMENT SITE: A CASE REPORT**

Rahnama M.1, Rahnama M.2, and Saberi M.3. 1University of Social Welfare and Rehabilitation Sciences, Physiotherapy, Tehran, Iran, 2 Shiraz University of Medical Sciences, Medicine, Shiraz, Iran, 3 Shiraz University of Medical Sciences, Physiotherapy, Shiraz, Iran.

**Background and Aims:** Nerve entrapment syndrome is frequently seen in individuals with poor posture. The condition is usually managed by anesthetic nerve blocks. Physiotherapy is not commonly advised to patients with nerve entrapment. In this case report, a successful treatment of a patient with nerve entrapment is reported.

**Methods:** A 28 years old lady has presented with severe burning pain in her right Cubital tunnel and numbness of ulnar side of her hand for 4 years. She was diagnosed with ulnar nerve entrapment at elbow site. After failure of medical treatments, she was referred for physiotherapy management. The patient was advised to undertake surgical intervention for transferring the ulnar nerve in case of physiotherapy failure. During physical evaluation, the patients showed positive ulnar nerve tension test with spreading pain to her arm. Palpation revealed two tender points including Guyon’s canal and subclavius muscle.

**Results:** Ulnar nerve mobilization and myofacial release techniques targeting on Guyon’s canal and subclavius muscle revealed the patient’s pain immediately after the treatment. The patient reported no numbness after 3 treatment sessions and no burning pain by 7 sessions. The patient was advised to modify her life style including driving positions to prevent the recurrence of the condition.

**Conclusions:** Nerve mobilization and myofacial techniques especially for subclavius muscle were effective treatment strategies in curing ulnar nerve entrapment.
entrapment. Accordingly, it is recommended to try these techniques prior to invasive surgical managements in similar conditions.

Peripheral Nerve Blocks

ESRA7-0270

REGIONAL ANAESTHESIA FOR SHOULDER SURGERY SHOULD NOT OVERSHADOW MULTIMODAL POST OPERATIVE ANALGESIA

Reynolds N., Cavalier A., and Sage F. East Surrey Hospital, Anaesthetics, Redhill, United Kingdom.

Background and Aims: The interscalene block is routinely used at East Surrey Hospital, either as a single shot or catheter technique for shoulder surgery.

The analgesia from a nerve block is finite and some institutions have demonstrated patients returning in pain days after discharge. It was necessary to investigate if our patient population are suffering from delayed pain or sleep disturbance once discharged.

Methods: The audit used a post operative questionnaire in which the patient rated their post operative pain and sleep scores on a Numerical Rating Scales (NRAS: 0 No pain/good sleep; 10 worst pain/poor sleep) This began in the Post Anaesthetic Care Unit (PACU) and extended to day 3.

Results: 12 patients responded with 10 collating full data. The pain NRAS in PACU was lowest at 1.5 with 50% of patients having no pain. Post operative pain steadily increased and peaked at day 2 with the an average NRAS of 4.5. This correlates with the poorest sleep pattern NRAS of 5.8 on day 2.

Conclusions: The use of regional anaesthesia is allowing patients to recover with low or absent pain from shoulder surgery in PACU. This pain score increases by day 2 and interferes with patients sleep cycle.

Changes should be made in regard to how we prescribe patients post operative analgesia. A comfortable patient in recovery should not negate proper multimodal post operative analgesia. A flow diagram to improve post operative multimodal drug prescription is to be developed to allow improve pain control at day 2.

Peripheral Nerve Blocks

ESRA7-0439

THE FEASIBILITY OF USING GENELYN EMBALMED CADAVERS FOR CLINICAL TRAINING OF THE ULTRASOUND-GUIDED PARAVERTEBRAL BLOCK

Kamat A.1, Bishop I.2, Robinson H.1, and Parson S.2 1Aberdeen Royal Infirmary, Anaesthetic Department, Aberdeen, United Kingdom; 2Anatomy, University of Aberdeen, Aberdeen, United Kingdom.

Background and Aims: Ultrasound-guided thoracic paravertebral block (PVB) has a broad spectrum of analgesic applications. Ultrasound guided regional anaesthesia (UGRA) requires the integration of several core skills including correct image acquisition, accurate needle guidance, and appropriate spread of local anaesthesia to allow the technique to be performed safely. This study evaluated the viability of using Genelyn™-fixed cadavers for out-of-plane ultrasound guided PVB training by assessing sonographic imaging quality and injection accuracy.

Methods: Out of plane ultrasound guided thoracic PVB blocks, using 10-15mls of Indocyanine Green (ICG) dye, were performed in four prone Genelyn™-fixed cadavers using 50mm 22G insulated echogenic needles. Antrior displacement of the pleura from the costo-transverse ligament upon dye injection was used to confirm correct needle position. Dissection of the paravertebral space was then performed to evaluate dye location and spread.

Results: The paravertebral space was clearly and easily located in all cadavers with ultrasound guidance and was confirmed by clinically relevant, anterior displacement of the pleura upon injection. No correlation however, was found between the observed anterior displacement of the pleura and ICG spread within the paravertebral space.

Conclusions: Genelyn-fixed cadavers accurately simulated sonoanatomy, suggesting they can be successfully used as a high-fidelity simulator for the PVB block. The retained tissue flexibility and quality of this embalming technique facilitated anterior displacement of the pleura and needle feedback. Conversely, poor dye localisation may have been due to retained embalming solution in these embalmed cadavers. We would like to thank the people of the North East of Scotland whose generous donations facilitated this project.

Peripheral Nerve Blocks

ESRA7-0053

POSTOPERATIVE ATTAINMENT TIME FOR DISCHARGE CRITERIA AND ACQUISITION OF "SEIZA" SITTING AFTER KNEE ARTHROPLASTY - COMPARISON OF FEMORAL TRIANGLE BLOCK WITH FEMORAL NERVE BLOCK

Sakai N. and Takada M. Daiyukai General Hospital, Dep. Anaesthesiology, Ichinomiya, Japan.

Background and Aims: Femoral nerve block (FNB) is a gold standard for postoperative pain management after total knee arthroplasty (TKA) however it lacks quadriceps. Femoral triangle block (FTB) on the apex of femoral triangle is a excellent counter plan for answering the unclear problem of adductor canal block (ACB) which has a confusing definition of block administration point without quadriceps weakness. We compared the effect of FTB for postoperative rehabilitation progression with FNB.

Methods: This was a retrospective chart review and our Institutional Review Board approved. Seventy-two subjects received single FNB or FTB with 0.25% ropivacaine 12ml before receiving TKA. We also administered preoperative tibial nerve block with 0.25% ropivacaine. We evaluated early discharge criteria (good pain control with oral analgesics without opiate, ability of knee flexion above 90 degrees, and gait rehabilitation without a help of physical therapist or nursing staff), ability of straight leg raise test (SLR) and availability of deep knee flexion including Japanese stile “Seiza” sitting.

Results: Postoperative attainment time for discharge criteria was not significantly different between two treatment groups, as FTB was 68.0 hours (range: 38-98 hours) versus FNB was 68.5 hours (41-116 hours). FTB group could acquire SLR test on POD1 (FTB: 32 patients versus FNB: 12 patients; p<0.001). Other outcomes was not significantly different. Patients who could attain “Seiza” sitting were also not different on the postoperative 3 months (FNB:12 patients, FTB:12 patients).

Conclusions: Postoperative attainment time for discharge and other rehabilitation milestone after TKA was not statistically different among two techniques, however FTB produced earlier postoperative SLR.

Peripheral Nerve Blocks

ESRA7-0228

WHO’S WHO OF MYOFASCIAL PLANE BLOCKS FOR UNILATERAL THORACIC WALL SURGERY; A LITERATURE REVIEW

Sato Y. Anjyndo Yaza Hospital, Anesthesia and Pain Medicine, Yaza, Japan.

Background and Aims: In recent years, increasing interest in regional anaesthesia for unilateral thoracic wall surgery was widespread from industrialized countries to developing countries. Hence many proposals were published among scientific literatures for regional anaesthesia techniques under various nomenclatures for such seemingly almost identical point of injection, local anesthetics dosage and clinical results. Some of the clinical reports provide with an anatomical study and tried to evaluate the mechanism of action of their proposed technique. However, the numbers of these anatomical studies were small and the results were not conclusive to clarify the mechanism of these blocks.

Methods: Authors collected and reviewed anesthetic literatures concerning the key word under the title of “Paravertebral lamina technique, Retroilarlar paravertebral block, Costovertebral canal block, Erector spinae muscle plane block or Paraspinal injection technique. These reports were analyzed according to their block technique, clinical results, presumed mechanism by radiographic and/or anatomical studies.

Results: All these reports claimed that the extent of analgesia was sufficient to undergo unilateral thoracic wall surgeries. However, these techniques could not provide analgesia for parasternal area. Anatomical and radiographic studies revealed the

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spread of injected dye was seen within myofascial layer of transversospinal muscles and/or erector spinae muscles, and seldom seen in thoracic paravertebral space.

Conclusions: Author concluded that the mechanism of these injection techniques may be different from that of the standard thoracic paravertebral block. Further studies will be needed to clarify the exact mechanism of these relatively simple, safe and effective blocks for unilateral thoracic wall surgery.

Peripheral Nerve Blocks

ESRA7-0039

DEVELOPMENT OF A MULTIDISCIPLINARY QUALITY IMPROVEMENT BUNDLE TO IMPROVE PERIOPERATIVE CARE IN THE MANAGEMENT OF NECK OF FEMUR FRACTURES AT DISTRICT GENERAL HOSPITAL

Saxena S., Eshebey S., Bower G. and Charles O. Croydon University Hospital, Anesthetics, London, United Kingdom.

Background and Aims: Hip fractures continue to pose a key challenge to health care, costing the NHS over £1 billion per year. A prospective audit in 2015 at Croydon University Hospital observed sub-optimal practice with protracted time to surgery 63% (national average 86%). With the introduction of a multidisciplinary quality improvement bundle, the aim of this study was to demonstrate service improvement as based on London Quality standards.

Methods: An improvement bundle for hip fractures was introduced. It included:
- Clear referral pathway to be initiated in A&E for early anaesthetic assessment
- Anaesthetic review within 6 hours to optimise patients’ for early surgery
- Training and teaching on nerve block administration in A&E and theatres
- Education on documenting pain scores before and after peripheral nerve blocks
- Weekly clinical governance highlighting a “process of the week” and relaying feedback of current care
- Designated “NOF noticeboard” outside trauma theatre displaying current target

Results: 120 NOF patients have been included for this audit

<table>
<thead>
<tr>
<th></th>
<th>National Average 2016 (%)</th>
<th>Croydon University 2015 (%)</th>
<th>Croydon University 2016 (%)</th>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Post Intervention</td>
</tr>
<tr>
<td>Surgery within 36 hours</td>
<td>91</td>
<td>93.7</td>
<td>93</td>
</tr>
<tr>
<td>Anaesthetic pain assessment</td>
<td>71.6</td>
<td>51.2</td>
<td>63.6</td>
</tr>
<tr>
<td>Nerve block documentation</td>
<td>43.3</td>
<td>NR</td>
<td>P1.1</td>
</tr>
<tr>
<td>Anaesthetic theatre</td>
<td>9.2</td>
<td>76</td>
<td>93</td>
</tr>
</tbody>
</table>

FIGURE 1.

Conclusions: Significant service improvements were noticed post intervention—

Reduced cancellations and improved awareness of National guidelines helped in achieving healthy work culture.

Improved local standards to achieve National averages, hence improving quality of service provided.

Development of new teaching sessions for A&E doctors on peripheral nerve blocks (PNB) to improve patient experience.

Creation of PNB stickers for standardized documentation to prevent duplication of blocks and hence toxicity.

Peripheral Nerve Blocks

ESRA7-0074

THE ULTRASOUND-GUIDED TRANSVERSALIS FASCIA PLANE BLOCK: AN ALTERNATIVE APPROACH FOR ANAESTHESIA IN INGUINAL HERNIORRHAPHY

Scimia P., Basso Ricci E.1, Petrucci E.2, Perna R.1, Marinangeli F.3, Fusco P.5
1Hospital of Cremona, Department of Anesthesia and Perioperative Medicine, Cremona, Italy; 2S.S. Filippo and Nicola Hospital Avezzano- L’Aquila, Department of Anesthesia and Intensive Care Unit, L’Aquila, Italy; 3Coniagi Bernardini Hospital Palestrina- Roma, Department of Anesthesia and Intensive Care Unit, Roma, Italy; 4University of L’Aquila, Department of Anesthesia and Intensive Care Unit, L’Aquila, Italy; 5Sabatale Hospital- L’Aquila, Department of Anesthesia and Intensive Care Unit, L’Aquila, Italy.

Background and Aims: The ultrasound-guided transversalis fascia plane block (US-TFPB) was first described by Hebbard as a novel technique which may have a role for postoperative analgesia following inguinal herniorrhaphy. This technique could provide a reliable block of the proximal portions of the target nerves T12-L1, which pass in a virtual anatomical triangular plane located...
Peripheral Nerve Blocks

ESRA7-0063

THE ASSOCIATION OF THE ULTRASOUND-GUIDED INTERSCALENE BLOCK AND SERRATUS PLANE BLOCK AS ANAESTHETIC TECHNIQUE FOR SHOULDER SURGERY WITH POSTERIOR APPROACH. A CASE REPORT

Scimia P.1, Giordano C.1, Basso Ricci E.1, Badassi P.2, Fusco P.1 1A.S.S.T. Cremona, Department of Anaesthesia and Perioperative Medicine, Cremona, Italy; 2A.S. S.T. Cremona, Department of Orthopaedics and Traumatology, Cremona, Italy; 3San Salvatore Hospital L’Aquila, Department of Anaesthesia and Perioperative Medicine, L’Aquila, Italy.

Background and Aims: Traditionally, in our institution, the ultrasound-guided interscalene block (US-IB) represent the standard anaesthetic technique for shoulder surgery. However, when surgery involves the manipulation of the posterior aspect of the glenoid capsule, this technique could not provide adequate intraoperative anaesthesia, probably due to insufficient blockade of the lateral branch of the thoracic intercostal nerves. We described the association of the US-IB and Ultrasound-guided Serratus plane block (US-SPB) as a successfully anaesthetic technique for shoulder surgery with posterior approach.

Methods: A 68 years old patient, ASA 2, scheduled to undergo open shoulder surgery to repair rotator cuff by posterior approach with transposition of the latissimus dorsi muscle. Written informed consent was obtained. In the operating room, after premedication with Midazolam 1 mg and Sufentanyl 0,1 mcg/kg, we performed the US-IB by injecting 0,5% Levobupivacaine 10 ml between C5 and C6 nerve roots. Then, an ipsilateral US-SPB was performed by injecting 0,375% Levobupivacaine 20 ml in the fascial plane between Serratus Anterior and Latissimus dorsi muscles. Intraoperative sedation was ensured with intravenously propofol 3mg/kg/h. Supplemental oxygen (4 L/min) was administered under expired CO2 control.

Results: A reliable anesthesia of the surgical area and a good quality postoperative analgesia were obtained. In the first 48 hours after surgery, only 3 g of acetaminophen with rescue dose of ketorolac 30 mg as needed were administered. No opioids were required.

Conclusions: This case report suggested that performing US-SPB combined to US-IB could represent an effective and safe technique for anaesthesia and postoperative analgesia in shoulder surgery with posterior approach.

Peripheral Nerve Blocks

ESRA7-0240

ULTRASOUND GUIDED SUB-OMOHYOID SUPRASCAPULAR NERVE BLOCK: A CADAVERIC DYE STUDY

SEHMBI H.1, DIHR S.1, and JOHNSON M.2 1Western University, Anesthesia & Perioperative Medicine, London, Canada; 2Western University, Anatomy & Cell Biology, London, Canada.

Background and Aims: The interscalene brachial plexus block, used to manage shoulder pain, is associated with a high incidence of phrenic nerve
Peripheral Nerve Blocks

ESRA7-0037

CONTINUOUS PSOAS SCIATIC BLOCKADE COULD BE A SOLE ANESTHETIC TECHNIQUE FOR TOTAL KNEE ARTHROPLASTY

Soltan W.1, Eltahawy M.S.2, and Ibrahim E.S.3 3Faculty Of Medicine, Anesthesiology, Shebeen El Kom, Egypt, 2 Ain Shams Faculty Of Medicine, Anesthesia, Cairo, Egypt, 3 Menoufia University Faculty Of Medicine, Anesthesia, Shebin Elkom, Egypt.

Background and Aims: Continuous psoas sciatic block is a modern anesthetic technique for lower extremities surgery avoiding the adverse effects of general anesthesia or central neuroaxial blockade especially in patients with multiple co-morbidities.

Methods: Subjects and Method: Ethical approval was obtained to perform the study amongst 80 patients ASA I-III ranging from ages 53-65 years. Subjects were divided into 2 groups; the first group (Pso/sci) received ultrasound guided nerve locator continuous psoas sciatic block and the second group (CSE) received combined spinal epidural anesthesia. Block time, contera-lateral spread, onset of sensory and motor block, first need for analgesia, hemo-dynamic changes, incidence of complications, patient and surgeon satisfactions were recorded.

Results: All patients had successful block, the block time was significantly high in the (Pso/sci) group, 2 patients in (Pso/sci) had a contra-lateral spread, sensory and motor block onsets were delayed significantly in (Pso/sci), first analgesic request was significantly later in (Pso/sci). Although hemo-dynamic change was higher in CSE, however it was not to a significant level. There were no differences found in complications, as well as patient and surgeon satisfactions.

Conclusions: Psoas/Sciatic block is an alternative, safe and successful anesthetic technique which provides an adequate anesthetic level for all lower extremities surgeries with less hemo-dynamics changes.

Peripheral Nerve Blocks

ESRA7-0026

PAIN SCALE AND PLASMA CORTISOL LEVELS ON LOWER ABDOMINAL SURGERY CONDUCTED BY TRANSVERSUS ABDOMINIS PLANE (TAP) BLOCK FOR PAIN MANAGEMENT

Soemartono C. Pujo Semedi B. Sunarso Sulistyawani S. Universitas Airlangga, Anesthesiology and Reanimation Department, Surabaya, Indonesia.

Background and Aims: Post-surgery lower abdominal pain can increase stress-related cortisol that have an important endocrine response. Transversus abdominis Plane (TAP) block is one of peripheral nerve block technique providing analgesic effect which effective and well developed. This study aimed to analyze the correlation between pain intensity with cortisol level profile that conducted by pain management using TAP block on lower abdominal surgery.

Methods: The study design was observational analysis method. The study was conducted at Dr. Soetomo Hospital for 30 research subjects.

Results: Plasma cortisol and pain response with VAS was examined before surgery and during the first 24 hours post-surgery. Characteristic data of study samples of vertical incision frequency was 9 and transversal incision frequency was 21. Mean of cortisol levels in pre-surgery (16.99 ± 8.76), in 1 hour post-TAP block post-surgery (22.63 ± 13.50) and in afternoon post surgery (21.33 ± 15.26). Meanwhile, median of pain scale in pre-surgery (0) with interval (0 - 3), in post-surgery (3) with interval (1 - 6), 1 hour phase post-surgery after TAP block (1) with interval (0 - 3) and in afternoons after surgery (0) with interval (0 - 2). TAP Block injection effectively decreased postoperative pain, but the correlation of Plasma and cortisol levels in pre-surgery (p > 0.05), in 1 hour post-surgery after TAP block (p > 0.05), as well as in afternoon phase post-surgery (p > 0.05) was insignificant.

Conclusions: A 5 ml injection for SOS block appears to provide an optimal volume, without spread to the phrenic nerve. Further clinical studies are required for confirmation.
Conclusions: Measurement of pain intensity with mild-moderate scale category (1-6) is not related to the plasma cortisol levels profile. The Diagnosis of pain objectively with biomolecular markers still require further research.

Peripheral Nerve Blocks

ESRA7-0391

PSOAS COMPARTMENT BLOCK FOR HIP REPLACEMENT SURGERY IN ELDERLY HIGH-RISK PATIENTS
Sahin A.S.1, Derbent A.1, Ay N.1, Sahilhoglu Z.1, and Acikgoz A.2 1Kanuni SS Training and Research Hospital, ANESTHESIA AND REANIMATION, ISTANBUL, Turkey, 2Klinikum Nordstadt Hannover, Anesthesiology and Reanimation, Hannover, Germany.

Background and Aims: Hip replacement surgery is common among elderly patients. These patients have increased risk of perioperative mortality and morbidity due to additional co-morbidities. The use of regional anaesthetic methods during hip replacement surgery reduces intraoperative blood loss and the risk of postoperative deep venous thrombosis.

Methods: Twenty-two patients undergoing KA under combined sciatic and femoral nerve block (SNB) and femoral nerve block (FNB) were randomly allocated to Group Atracurium (GrA) and Group Saline (GrS). After obtaining baseline values and safety (SAFE), anatomy of related structures (ANA), how to do upper extremity and trunk blocks (RB) and use of ultrasound (US). Residents were evaluated with 25 multiple choice questions (Posttest) immediately after completion of lessons, at 6th and 12 months. Residents started to perform block skills in their practice. Statistical analysis performed by repeated measures of ANOVA for the tests.

Results: Results of 14 resident’s ages ranging 26-33 years and residency period of 1-28 months were included in this study. Statistically no significance was shown between repeated tests (p=0.05). Pretest difficulty was rated as low and posttest rated very difficult by consultants not involved in this Project.

Peripheral Nerve Blocks

ESRA7-0344

EVALUATION OF A STRUCTURED CURRICULUM IN REGIONAL ANESTHESIA TRAINING OF RESIDENTS
Gucerli Y.1, Guneyli C.2, Sutas Bozkurt P.3, Aydin G.1, Alyagut E.1, Cakmak M.1, and Gunturk S.1 1SBU Izmir Tepecik Education and Research Hospital, Anesthesiology and Reanimation Department, Izmir, Turkey, 2SBU Bagcilar Education and Research Hospital, Anesthesiology and Reanimation Department, Istanbul, Turkey, 3Izmir Katip Celebi University Faculty of Pharmacy, Kocaeli, Turkey.

Background and Aims: A structured curriculum planned for education of PRA to residents. A structured curriculum planned for education of PRA to residents. Following 2 hours of didactic lessons 20 residents completed pretest (pre) with 20 True/False questions. Later residents had attended 11 hours of interactive lessons in Spring 2016; topics consisting of pharmacology (PHA), precautions and safety (SAFE), anatomy of related structures (ANA), how to do upper extremity and trunk blocks (RB) and use of ultrasound (US). Residents were evaluated with 25 multiple choice questions (Posttest) immediately after completion of lessons, at 6th and 12 months. Residents started to perform block skills in their practice. Statistical analysis performed by repeated measures of ANOVA for the tests.

Results: Results of 14 resident’s ages ranging 26-33 years and residency period of 1-28 months were included in this study. Statistically no significance was shown between repeated tests (p=0.05). Pretest difficulty was rated as low and posttest rated very difficult by consultants not involved in this Project.

Peripheral Nerve Blocks

ESRA7-0359

A MODIFICATION OF COMBINED SCIATIC AND FEMORAL NERVE BLOCK TO IMPROVE THE INSUFFICIENT MUSCLE RELAXATION DURING KNEE ARTHROSCOPY
Tezer T.1, Gungor L.2, Zinuroglu M.1, Satana Kara E.3, Bayazova M.1, and Kaya K.1 1Ankara Bayindir Hospital, Anesthesiology and Reanimation, Ankara, Turkey, 2Gazi University Faculty of Medicine, Anesthesiology and Reanimation, ANKARA, Turkey, 3Gazi University Faculty of Medicine, Physical Medicine and Rehabilitation, ANKARA, Turkey.

Background and Aims: Knee arthroscopy (KA) should be performed under optimum muscle relaxation in order to obtain a complete exposure of the joint. Being inspired by the Bier’s block, we proposed a new modification to improve the possible insufficient muscle relaxation of peripheral nerve blocks (PNB) in patients undergoing KA.

Methods: Twenty-two patients undergoing KA under combined sciatic (SNB) and femoral nerve block (FNB) were randomly allocated to Group Atracurium (GrA) and Group Saline (GrS). After obtaining baseline values of motor evoked potentials (MEP) from gracilis (G), rectus femoris (RF), tibialis anterior (TA) and gastrocnemius (GC) muscles; SNB and FNB were performed. MEP’s were recorded every 5 minutes for a 30 minute(T0)-period. Afterwards a thigh tourniquet was applied and an IV canula was inserted on the dorsum of the foot. After the tourniquet was inflated; 5 mg atracurium diluted in 50ml %0.9saline solution (SS) and only 50ml SS were injected in GrA and GrS respectively. MEP’s were recorded at 5th and 10th minutes following the injections. MEP’s: from RF, GC and TA muscles showed significant decrements from baseline to T10 in both groups. In GrA mean decrease of MEP’s from TA and GC muscles at 10 minutes after the atracurium injection showed a marginal trend toward significance (p=0.068 and p=0.066 respectively) when compared to T0 values.

Conclusions: MEP’s may serve as a promising tool in monitoring the muscle relaxation following PNB’s. On the other hand intravascular application of an neuromuscular blocking agent distal to thigh tourniquet may be beneficial for further muscle relaxation.
Peripheral Nerve Blocks

ESRA7-0463

ULTRASOUND GUIDED STELLATE GANGLION BLOCK FOR ACUTE NEUROPATHIC ISCHEMIC PAIN MANAGEMENT OF UPPER LIMB-TWO CASE REPORTS

Thottungal A., Kent and Canterbury hospital, Anaesthetics, Canterbury, United Kingdom.

Background and Aims: Sympathetic block is found to be useful for various acute vascular ischemic conditions. The neuropathic pain along with ischemic pain can be very difficult to control. Most of the vascular patients present with coexisting renal impairment and pharmacological management can be challenging. The sympathetic supply to the upper limb is from T1-9 and passes through stellate ganglion. Use of ultrasound helps to do the block safely and effectively which can be very useful to treat this difficult group of patients.

Methods: Case 1-65 year old female, ASA 3, with renal impairment was admitted with acute ischemic upper limb. The standard analgesic regime of Paracetamol and oxycodone was not sufficient to control her ischemic and neuropathic pain. She had first test block of stellate ganglion block under ultrasound guidance using 5 ml of 0.125% chirocaine and 7.6 mg of preservative free dexamethasone. Pain score was reduced from 10/10 to 4/10 within 20 minutes.

Case 2: 40 year old male, ASA2 patient admitted with acute bilateral ischemic limb. Patient had uncontrolled pain and could not tolerate standard high dose opioid based analgesia in spite of trying various agents. And endoscopic thoracic sympathectomy. Patient had a stellate ganglion block under ultrasound. The pain score was reduced to 1/2/10.

Results: Both complex pain patients were managed well using stellate ganglion block to treat acute ischemic limb pain.

Conclusions: Sympathetic block can be used to treat acute ischemic limb pain successfully. Ultrasound guidance reduces the risks and increases the success rate of stellate ganglion blocks.

Peripheral Nerve Blocks

ESRA7-0176

MAJOR LOWER EXTREMITY AMPUTATION WITH PERIPHERAL NERVE BLOCKS IN HIGH RISK PATIENTS

Beh Z.Y., Rajkumar C., Tsai F.C., Lim J.Y., and Kuruppu S.D. Changi General Hospital, Anaesthesia & Surgical Intensive Care, Singapore, Singapore.

Background and Aims: Major lower extremity amputation (MLEA) is associated with considerable mortality and morbidity. Studies have shown mortality benefits of using regional anaesthesia techniques. However the effects of peripheral nerve blocks (PNB) as the sole anaesthetic technique in high risk patients undergoing MLEA have not been fully evaluated. We evaluate the use of PNB in the study population, patient outcome and predictive factors of mortality.

Methods: This is a retrospective cohort study. We evaluated 68 high risk cases from a total of 150 cases underwent non traumatic MLEA using PNB in between January 2010 till December 2014. Outcomes measured: success of the operation, block details, intraoperative haemodynamics, usage of sedation and analgesia, major comorbidities, mortality rates at 30 days and 1 year.

Results: Out of 68 cases, 99% (67) ASA IV, 68% (46) males and median age (IQR [range]) was 70 (59.5 – 80 [38 – 97]) years. 53% (36) had AKAs and 47% (32) had BKA. 93% successfully underwent surgery with PNB. 90% required intra-operative sedation and analgesia. AKAS group required higher sedation and analgesia compared to the BKA group (p = 0.038). In the AKAs group, 50% received combined femoral, obturator and sciatic nerve blocks and another 50% had combined femoral and sciatic nerve (FS) blocks. 94% had FS blocks in the BKA group. The 30-day and 1 year mortality was 8.8% & 33%.

Conclusions: PNB can be used as the sole anaesthetic technique in high risk patients having MLEA. Mortality rates were lower to those reported in literature.

Peripheral Nerve Blocks

ESRA7-0194

INITIAL EVALUATION OF A NEWLY DEVELOPED HOSPITAL SERVICE FOR HAND SURGERY EXCLUSIVELY UNDER REGIONAL NERVE BLOCK

Chiam P. 1, Vellore S. 2, James Cook Hospital South Tees Hospital NHS Foundation Trust, Anaesthetics, Middlesbrough, United Kingdom, 2 James Cook Hospital South Tees Hospital NHS Foundation Trust, Anaesthetics, Middlesbrough, United Kingdom.

Background and Aims: Surgery under Regional Anaesthesia (RA) alone potentially allows early return home for patients without the risks/effects of General Anaesthesia (GA). Our hospital developed a new service for hand surgery exclusively under Regional Nerve Block (RNB). The aim was to evaluate this new service regarding success of the RNB, effect of type of local anesthetic on the time to establish RNB and patient satisfaction at follow-up.

Methods: All patients who had RNB for hand surgery from January to April 2017 were studied. Data was collected prospectively at the time of the procedure on an audit proforma. Theatre IT system and a telephone follow-up details were also accessed. Local Ethics Committee approval was sought.

Table 2: Effect of type of local anaesthetic on time for block to be ready for surgery

<table>
<thead>
<tr>
<th>Local Anaesthetic used for block</th>
<th>Number</th>
<th>Time taken for block to be ready for surgery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lignocaine 1% or 2%</td>
<td>4</td>
<td>15 to 30 min</td>
</tr>
<tr>
<td>Lignocaine 1% or 2% with 1 in 200,000 adrenaline</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Lignocaine 1% or 2% plus 0.25 %, 0.5% or 0.75% levobupivacaine</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>Lignocaine 1% or 2% with 1 in 200,000 adrenaline plus 0.25 %, 0.5% or 0.75% levobupivacaine</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>1 % prilocaine</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>1% prilocaine plus levobupivacaine</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Levobupivacaine on its own (varying concentrations)</td>
<td>14</td>
<td>40 to 140 min</td>
</tr>
<tr>
<td>Drug not documented</td>
<td>11</td>
<td></td>
</tr>
</tbody>
</table>

Table 3 Patient satisfaction at follow-up

<table>
<thead>
<tr>
<th>Number of patients successfully followed up = 49</th>
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<tbody>
<tr>
<td>Quality of block</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Would have block again</td>
</tr>
<tr>
<td>Would recommend block to others</td>
</tr>
<tr>
<td>Would recommend block to others</td>
</tr>
</tbody>
</table>

TABLE 3. Patient satisfaction at follow-up.
Results: Of the 62 patients studied, 53 had Axillary Brachial Plexus Block (BPB) and 6 had Supraclavicular BPB. An Arm/Forearm nerve block was used in 3 patients. Among the Axillary BPBs, 4 needed a rescue block and 2 needed GA.

The time to establish RNB was less than 30 min when lignocaine or prilocaine were used either on their own or in combination with levobupivacaine. It was between 40 and 140 minutes when levobupivacaine was exclusively used.

Of the 49 patients followed up, 47 rated the quality of RA as good/excellent, 43 would have RA again and 47 would recommend it to others. The time to establish RNB was less than 30 min when lignocaine or prilocaine were used either on their own or in combination with levobupivacaine. It was between 40 and 140 minutes when levobupivacaine was exclusively used.

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Methods: In this case report, we describe the use of the Shamrock lumbar plexus block and parasacral parallel shift (PSPS) block, as the sole anaesthetic techniques for a patient with various co-morbidities, scheduled for intramedullary nailing hip surgery.

Results: Results are shown below. 20 ml of ropivacaine 0.5% with 1:400,000 adrenaline was administered for the PSPS block (Fig1) and Shamrock lumbar plexus block (Fig2) respectively, under direct ultrasound-guidance and nerve stimulation at 0.4mA. The patient was sedated with a propofol infusion and did not require further analgesia during the surgery. The patient also remained comfortable post-operatively.

Peripheral Nerve Blocks

ESRA7-0348

ADDUCTOR CANAL BLOCK FOR TOTAL KNEE REPLACEMENT - AN AUDIT TO ASSESS EFFECTIVENESS

Venkatesh V., Bhat A., and Karimi A. Birmingham Heartlands hospital, Department of Anaesthetics and Critical Care, Birmingham, United Kingdom.

Background and Aims: Adductor canal block (ACB) is gaining popularity as a part of multimodal anaesthetic technique for patients undergoing Total Knee Replacement (TKR). This audit was carried out to look at the standard of anaesthetic care in our department for TKR and if the ACB afforded any advantages for patients having TKR.

Methods: After audit committee approval, data was collected retrospectively from clinical notes and health care software used in our institution. 60 patients were selected of which 30 had undergone TKR under spinal block and 30 who had ACB in addition to spinal. 300-500 mcg of Diamorphine was used as adjuvant for all spinals. Data was collected about pain scores and significant side effects in the first 24 hours post-op as well as about patients’ compliance with physiotherapy on the morning after surgery.

Results: Pain scores were noticeably lower during the first 24 hrs post-op in patients who had ACB with spinal versus those who had spinal only. Compliance with physiotherapy was higher in the ACB group (63%) compared to non-ACB group (47%). The overall incidence of postoperative urinary retention needing catheterization was 41.66%, incidence being higher in males (65.3%) compared to females (23.5%).

Conclusions: ACB is likely to supplement well in recovery of TKR patients by improving post-op pain control and physiotherapy compliance in the first 24 hours. ACB combined with effective surgical local anaesthetic infiltration may support minimizing the use of spinal diamorphine for TKR, potentially decreasing the incidence of urinary catheterization.

Peripheral Nerve Blocks

ESRA7-0090

THE USE OF NOVEL ULTRASOUND-GUIDED LUMBAR AND SACRAL PLEXUS BLOCK TECHNIQUES FOR HIP SURGERY - A CASE REPORT

Tey J.B.L., Cuttilan R.A., Wong W.Y. Tan Tock Seng Hospital, Department of Anaesthesia-Intensive Care and Pain Medicine, Singapore, Singapore; Tan Tock Seng Hospital, Department of Anaesthesia-Intensive Care and Pain Medicine, Singapore, Singapore.

Background and Aims: The use of the lumbar plexus and parasacral plexus blocks has been described to provide analgesia for hip surgery, but primarily for patients presenting with aortic stenosis. Methods include landmark technique using Capdevilla or Winnie’s approach for anaesthesia of the lumbar plexus, and the para-sacral, sub-gluteal or sciatic nerve blocks to target the sacral plexus but with difficult replicability and identification of sonographic images.

Methods: In this case report, we describe the use of the Shamrock lumbar plexus block and parasacral parallel shift (PSPS) block, as the sole anaesthetic techniques for a patient with various co-morbidities, scheduled for intramedullary nailing hip surgery.

Results: Results are shown below. 20 ml of ropivacaine 0.5% with 1:400,000 adrenaline was administered for the PSPS block (Fig1) and Shamrock lumbar plexus block (Fig2) respectively, under direct ultrasound-guidance and nerve stimulation at 0.4mA. The patient was sedated with a propofol infusion and did not require further analgesia during the surgery. The patient also remained comfortable post-operatively.

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*The typical shamrock image for a lumbar plexus block at the L4 level. The needle is inserted in plane through the erector spinae muscle (ES) to contact the lumbar plexus (* Quadratus lumborum muscle (QL); P*
Peripheral Nerve Blocks

ESRA7-0364

"7 O’CLOCK TIME TO BLOCK:’ ANALYSIS AND IMPACT OF ULTRASOUND GUIDED REGIONAL ANAESTHESIA (UGRA) AT THE LISTER HOSPITAL, STEVENAGE, UNITED KINGDOM

Chirvasuta R., Panagoda P., Yap G., and Manocha A. Lister Hospital, Anaesthetics, Stevenage, United Kingdom.

Background and Aims: Ultrasound Guided Regional Anaesthesia (UGRA) Teaching at the Lister Hospital has been organised for over a year. Sessions are held bimonthly before the start of work (7.15-8:00am). As attendance is voluntary, we have looked at the motivations for attendance or non-attendance, and the self-perceived benefits from this teaching.

Methods: We analysed feedback forms from 19 RA teaching sessions between 19/04/2016 and 13/04/2017. We also surveyed anaesthetic staff using a short questionnaire.

Results: Overall response rate to the questionnaire was 72% (56/78). 100% of participants felt that this teaching was useful, with 68% citing a change in their practice. Average self-assessed pre-teaching score was 5.5 (scale 1-10) and post-teaching was 7.8.

Conclusions: UGRA teaching generated a variable interest among the Lister Hospital Anaesthetic department, with an overall attendance of 54%. Amongst attendees, there was a unanimous feeling that this teaching was useful, with 68% citing a change in their practice. Average self-assessed pre-teaching score was 5.5 (scale 1-10) and post-teaching was 7.8.

Peripheral Nerve Blocks

ESRA7-0080

EFFECT OF ADDUCTOR CANAL BLOCK ON MEDIAL COMPARTMENT KNEE PAIN IN PATIENTS WITH KNEE OSTEOARTHRITIS: RETROSPECTIVE COMPARATIVE STUDY

Yoon S.H. Ajou University School of Medicine, Physical Medicine & Rehabilitation, Suwon, Republic of Korea.

Background and Aims: Pain is the chief complaint of symptomatic knee osteoarthritis (KOA) and a leading cause of chronic disability which is most often found in medial knees. The aim of this study is to evaluate the efficacy of pain relief and functional improvement in knee osteoarthritis (KOA) patients treated with ultrasound-guided adductor canal block (ACB).

Methods: This is a 3-month retrospective case-controlled comparative study. 200 patients with arthroplasty surgery were randomized into two groups, 92 patients received ACB with 9 mL of 1% lidocaine and 1 mL of 10 mg triamcinolone acetonide (ACB group), and 108 continued conservative treatments (control group). The main outcome measure was visual analog scale (VAS) of the average knee pain level. Secondary outcomes were the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC), the timed up and go test, numbers of analgesic ingestion per day, and opioid consumption per day.

Results: During the three month follow-up, 86 patients in ACB group and 92 in control group were analyzed. There were no significant difference, with the exception of the duration of symptoms, between the two groups in age, sex, body mass index, and Kellgren-Lawrence grade. Repeated-measures analysis of variance and post hoc tests showed improvement of VAS (at month 1), WOMAC (at month 1), and opioid consumption per day (at month 1 and 2) in ACB group.

Conclusions: ACB is an effective and safe treatment and can be an option for patients who are either unresponsive or unable to take analgesics.

Peripheral Nerve Blocks

ESRA7-0301

QUADRATUS LUMBOBORM BLOCK FOR BOTH CHOLECYSTECTOMY AND RIGHT SIDED NEPHRECTOMY

Gurkan Y.¹, Yorukoglu H.U.¹, Ulugel H.², and Kus A.¹ ¹Kocaeli University Faculty of Medicine, Department of Anaesthesiology and Reanimation, Kocaeli, Turkey, ²Acibadem Faculty of Medicine, Department of Anaesthesiology and Reanimation, Istanbul, Turkey.

Background and Aims: The quadratus lumbarum block (QLB) is a unilateral femoral plane block which extends from T4 to L1 at the para-vertebral space. In this case report, we share the results of a patient who had surgery for cholecystectomy and right nephrectomy surgeries at the same session.

Methods: Forty-six years old, ASA I female patient underwent open surgery for cholecystectomy and right sided nephrectomy operations at the same session. After the general anesthesia was induced with propofol and fentanyl, QLB was performed in the left lateral decubitus position. A convex probe was placed in transverse orientation between the iliac crest and the costal margin at the midclavicular line. By using the fascial plane technique, 20cc of 0.5% bupivacaine was injected to the facial plane between the quadratus lumborum and psoas major muscles. The surgery lasted four hours and completed uneventfully. Patient was administered tramadol 100 mg and paracetamol 1 gm IV. In the postoperative period, patient was provided with morphine PCA. Patient controlled analgesia device was set to deliver 1 mg bolus dose and had 8 minutes of lock out period.

Results: Patient was comfortable and pain free most of the time in the first post-operative 24 hours. After 24 hours, VAS score was 0 and total demanded dose of morphine was 13 mg.

Conclusions: This case report recommends that QLB may be an adequate choice for post-operative pain management fort patients undergoing cholecystectomy and nephrectomy surgeries.

Peripheral Nerve Blocks

ESRA7-0042

ANALGESIC EFFICACY OF ULTRASOUND-GUIDED LOCAL ANESTHETIC INJECTION INTO THE LONGUS CAPITIS MUSCLE IN CAROTID ENDARTERECTOMY: A RETROSPECTIVE COMPARATIVE STUDY

Yoshida T.¹, Ando A.², Nakamoto T.¹, and Ikeda S.² ¹Kansai Medical University Hospital, Department of Anesthesiology, Hirakata-city, Japan, ²Baba Memorial Hospital, Department of Anesthesiology, Sakai-city, Japan.

Background and Aims: A deep cervical plexus block can be performed as part of anesthetic management for carotid endarterectomy (CEA). Usui et al. reported that the longus capitis muscle (LCM) is a suitable landmark for blocking the deep cervical plexus and the cervical sympathetic trunk simultaneously. We hypothesized that an ultrasound-guided local anesthetic injection into the LCM reduces analgesic consumption during CEA.

Methods: The institutional review board waived the requirement for approval for study presentation. We reviewed the records of patients receiving CEA under general anesthesia in our hospital during 2016. The patients were divided into the injection group (n = 14) and the control group (n = 24), depending on whether or not a patient received a local anesthetic injection into the LCM. The injection group patients received an ultrasound-guided LCM injection of 10–15 ml of 0.25% levobupivacaine at the level of the 4th cervical vertebra immediately after induction of general anesthesia. Anesthesia maintenance consisted of a continuous infusion of remifentanil and bolus injections of fentanyl.

The primary outcome of this study was intraoperative opioid consumption (sum of
remifentanil and fentanyl in μg/kg). The incidence of postoperative nausea and vomiting, and the amount of postoperative analgesics used were also assessed.

**Results:** Intraoperative opioid consumption (mean [SD] μg/kg) was lower in the injection group (25.9 [6.1]) than the control group (37.2 [13.5]) \( p = 0.001 \). The other outcomes did not differ significantly between the groups.

**Conclusions:** Ultrasound-guided local anesthetic injection into the LCM is a promising technique as an analgesic during CEA.

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**Peripheral Nerve Blocks**

**ESRA7-0041**

**A NEW ULTRASOUND-GUIDED LATERAL APPROACH FOR PROXIMAL SCIATIC NERVE BLOCK: TECHNICAL DESCRIPTION AND RETROSPECTIVE EVALUATION**

Yoshida T., Nakamoto T., and Kamibayashi T. Kansui Medical University Hospital, Department of Anesthesiology, Hirokata-city, Japan.

**Background and Aims:** The lateral approach for proximal sciatic nerve block (PNB) for patients in the supine position is technically difficult, involving lateral-to-medial insertion of the needle at the level of the trochanter major. Therefore, we used ultrasound-guidance to localize the sciatic nerve. Herein we describe the ultrasound-guided lateral approach for PNB and retrospectively evaluate its success rate.

**Methods:** Under ultrasound-guidance, a curved array transducer was placed between the trochanter major and ischial tuberosity of the supine patient. Once the trochanter major was confirmed and the origin of the femoral biceps muscle attached to the ischial tuberosity was identified, the sciatic nerve was observed lateral to the femoral biceps muscle, just beneath the gluteal major muscle. A needle was inserted between the transducer and the trochanter major and advanced toward the sciatic nerve, in plane with the transducer. Electrical nerve stimulation was used simultaneously. After confirming dorsi-or plantar flexion of the ankle elicited by electrical stimulation, local anesthetic (20 ml) was injected. To assess the success of PNB, we reviewed anesthetic charts of patients who underwent this procedure between January and February 2017 in our hospital. The IRB approved this retrospective evaluation.

**Results:** Nine patients underwent a PNB using the ultrasound-guided lateral approach. Sensory blockade on both dorsi and planta pedis was confirmed by pinprick in all cases. Concomitant posterior femoral cutaneous nerve block was confirmed in 8 cases.

**Conclusions:** The lateral approach for PNB is a promising technique for patients in the supine position. The difficulty of this technique is ameliorated using ultrasound guidance.

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**Peripheral Nerve Blocks**

**ESRA7-0341**

**PECTORAL NERVES BLOCK (PECS II) VS. PARAVERTERBAL BLOCK FOR MASTECTOMY SURGERY**

Young B.1, Connolly D.7, Ferryman J.2, West S.1, and Ng S.1 1University College London Hospital, Anaesthetics, London, United Kingdom, 2University College London, Medicine, London, United Kingdom.

**Background and Aims:** Prior to the Pectoral Nerves Block (PECS II), post-operative analgesia technique for mastectomy surgery at University College Hospital was the Paravertebral Block (PVB). With the introduction of this novel interfascial block as an alternative analgesia for our surgical patients, we wanted to evaluate its success on peri-operative pain and recovery room (RR) management.

**Methods:** We retrospectively collected data for all female patients undergoing unilateral mastectomies +/- axillary clearance from August 2014 to March 2016. Sources of data included written notes, IT theatre systems and electronic drug charts.

**Results:** Seventy-nine patients were identified as having unilateral mastectomy with a regional technique - 55 received PVB and 24 received PECS II. All these patients underwent general anaesthesia. Patient characteristics and peri-operative data is shown in Table 1.

Although most patients received Patient Controlled Analgesia postoperatively, little usage data was recorded in the notes, which made the opiate requirements in the recovery room and on the wards difficult to analyse.

**Conclusions:** The use of the PECs II block showed a trend towards some reduction in intraoperative opioid use however overall it did not appear to alter the intraoperative analgesia and antiemetic requirements in RR significantly. It did demonstrate that at our institution PECs II provided similar analgesic requirements for patients undergoing mastectomy. This is encouraging in our practice as not all anesthetists are able to offer advanced regional anesthesia technique such as PVB.

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**Peripheral Nerve Blocks**

**ESRA7-0196**

**A NOVEL COMBINATION OF PERIPHERAL NERVE BLOCKS FOR ARTHROSCOPIC SHOULDER SURGERY**

Musso D.1, Flohr-Madsen S.2, Meknas K.3, Wilsgaard T.1, Ytrebo L.M.4, and Klostad Ø.1 1UIT - The Arctic University of Norway, Anaesthesiology, Tromso, Norway, 2UIT - The Arctic University of Norway, Department of Orthopaedic Surgery, Tromso, Norway, 3UIT - The Arctic University of Norway, Department of Community Medicine, Tromso, Norway.

**Background and Aims:** Intercalane brachial plexus block is currently the gold standard for intra- and postoperative pain management for patients undergoing arthroscopic shoulder surgery. However, it is associated with block related complications, of which effect on the phrenic nerve have been of most interest. Side effects caused by general anesthesia, when this is required, are also a concern. We hypothesized that the combination of superficial cervical plexus block, suprascapular nerve block and infraclavicular brachial plexus block would provide a good alternative to interscalene block and general anesthesia.

**Methods:** Twenty adult patients scheduled for arthroscopic shoulder surgery received a combination of superficial cervical plexus block (5 ml ropivacaine 0.5%), suprascapular nerve block (4 ml ropivacaine 0.5%), and lateral sagittal infraclavicular block (31 ml ropivacaine 0.75%). The primary aim was to find the proportion of patients who could be operated under light propofol sedation, without the need for opioids or artificial airway. Secondary aims were patients’ satisfaction and surgeons’ judgement of the operating conditions.

**Results:** Nineteen out of twenty patients (95%), CI 85-100) underwent arthroscopic shoulder surgery with light propofol sedation, but without opioids or artificial airway. The excluded patient was not comfortable in the beach chair position and therefore received general anesthesia. All patients were satisfied with the treatment on follow up interviews. The surgeons rated the operating conditions as good for all patients.

**Conclusions:** The novel combination of a superficial cervical plexus block, a suprascapular nerve block, and an infraclavicular nerve block provides an alternative anesthetic modality for arthroscopic shoulder surgery.
questionnaire focussed on information provision and experiences of pain and discomfort.

**Results:** 96% of respondents were completely satisfied with the information provided about NB, 4% were satisfied. However, only 75% received a correct advice on post-operative analgesia and some did not expect a numb arm. 81% of those who had NB performed awake did not have any pain during NB administration and 19% only had mild pain. In recovery 92% of patients were completely comfortable, 4% experienced mild pain and 4% - moderate. After the block wore off, 42.5% had moderate to severe pain, including 23% who had severe pain. Overall, 86.5% were completely satisfied with NB, 11.5% were satisfied and 2% were neither satisfied or dissatisfied. Almost all respondents (98%) were willing to undergo a repeat NB, 2% - would consider.

**Conclusions:** Almost all respondents were happy with NB. To address the obvious cause could be identified.

**Regional Anesthesia and Pain Medicine**

Group A (regional) consisted of 8 patients. All of them had abdom-serrates anterior plane catheters were inserted & fixed by surgeons. Almost all respondents were happy with NB. To address the obvious cause could be identified.

**Abdominal wall block provides accurate, controlled and superior analgesia compared with wound infiltration with local anesthetic. Reduction in length of stay and analgesia requirements in recovery has significant impact on patients and capacity of the anaesthetised arm.**

**Peripheral Nerve Blocks**

**ESRA7-0054**

**POSTOPERATIVE NEUROLOGICAL DEFICIT EXTENDING BEYOND 48 HOURS AFTER A PERIPHERAL NERVE BLOCK**

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**Background and Aims:** Peripheral nerve blocks (PNB) are an integral part of today's anesthetic management, worldwide. Although residual neurological deficits after a peripheral nerve block, subsides within 24 hours of postoperative period, sometimes it extends beyond 48 hours. We want to find the incidence of patients who continue to experience postoperative neurologic deficits 48 hours after a PNB and assess if we are in accordance with the incidence found internationally (3.7% - 8.2%). We also want to identify possible causes which could have resulted in these neurologic deficits.

**Methods:** After obtaining approval from Dubai health Authority, we identified total number of patients receiving PNBs in year 2014, 2015, 2016 by retrospectively searching our database. Then we identified the number of patients who experienced neurologic deficits extending beyond 48 hours after a PNB. To identify a cause, we have so far analysed 50 out of a total of 92 of these patients with respect to their diagnosis, surgical details, anesthetic details, neurologic deficit experienced, investigations and results, follow-ups.

**Results:** Incidence for a combined 3 years period (2014-2016) was found to be 1.25%. Out of 50 patients that we analysed so far, 10 patients experienced neurologic deficits extending beyond 48 hours due to anesthetic causes, 6 due to surgical reasons, a combined 8 due to nature of injuries itself. In rest 26 patients no obvious cause could be identified.

**Conclusions:** A careful selection of patients who will receive peripheral nerve blocks, a higher emphasis on block technique and right concentration and volume planned for each patient, can further reduce the anesthetic related neurologic deficits extending beyond 48 hours.

**Postoperative Pain Management**

**ESRA7-0066**

**USING WOUND INFILTRATION CATHETER FOR PAIN MANAGEMENT AFTER THORACOTOMY PROCEDURE**

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**Background and Aims:** Thoracotomy is very painful & pain control is mandatory for patient's comfort & to allow coughing & breathing deeply without splinting thus minimizing pulmonary complications & preventing chronicity.

Several pain control procedures were used & succeeded in lowering the postoperative pain scores, e.g. (thoracic epidural, paravertebral blocks, intercostal nerve blocks & narcotics). Serious complications were recorded. Plus time, trained hands & tight control of coagulation profile were always required.

2013, Blanco described the serrates anterior block then two more case reports were published later. All three, were given ultrasound guided & provided sufficient anesthesia & analgesia & avoiding the serious complications of neuro-axial techniques or TPVBs, but still time consumption, trained hands & an ultrasound machine were another limitations.

We have thought of overcoming these limitations by asking our surgeons to insert a multi-hole infiltration catheter under vision in the serratus muscle facial plane just at the end of the surgery through which Ropivacaine infusion is delivered before patient's extubation.

**Methods** Serrates anterior plane catheters were inserted & fixed by surgeons at the end of the surgical procedure, then a bolus of 20ml Ropivacaine followed by infusion of 5ml/hr of 0.2% Ropivacaine for 48hs.

**Results:** All patients showed low pain scores (2/10) with deep breathing, coughing & using the incentive spirometry, none needed additional opioids & none developed any complications.

Our patients were reviewed 3 & 6 months later & no one develop chronic pain.

**Conclusions:** Serrates anterior wound infiltration catheter is an easy, effective, complications free, doesn’t require special skills or machines & not time consuming.

**Postoperative Pain Management**

**ESRA7-0148**

**CONTINUOUS BILATERAL TRANSVERSE ABDOMINIS PLANE BLOCKS DECREASE OPIOID CONSUMPTION BY 47 PERCENT FOLLOWING LAPAROSCOPIC COLORECTAL SURGERY**

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**Background and Aims:** The reduction of opioids during the postoperative period is the focus of most enhanced recovery protocols. Many of these protocols for laparoscopic colorectal surgery utilize truncal blocks such as single injection bilateral transversus abdominis plane blocks instead of low thoracic...
epidurals. The purpose of this study was to evaluate the effectiveness of single injection versus continuous transverse abdominis plane blocks on postoperative opioid consumption for 48 hours.

**Methods:** A retrospective chart review of elective laparoscopic colorectal procedures was performed (n=34). All patients received intrathecal morphine 200mcg, similar postoperative opioid orders, alvimopan 12 mg PO, and either bilateral single injection transverse abdominis plane blocks with 15ml of 0.5% ropivacaine on each side or continuous bilateral transverse abdominis plane blocks with the same initial bolus. Then a 0.2% ropivacaine infusion at 5ml/hr is started bilaterally for 48 hours. All opioid data was collected and converted to IV morphine equivalents utilizing GlobalRPh program.

**Results:** The continuous TAP block group received 47% less opioids over 48 hours (p=0.031). This significant decrease was noted during the postanesthesia care unit (p=0.049) and within the first 24 hours (p=0.006). The opioid consumption for the following 24 hours was not statistically significant (p>0.05).

**Conclusions:** Continuous transverse abdominis plane blocks significantly decreased the opioid consumption during the postoperative period. The substitution of this modality for low thoracic epidurals could assist in decreasing opioid-related complications as well as known difficulties with low thoracic epidural such as systemic hypotension, Foley catheter placement, delayed ambulation, and interference with anticoagulation.

**Postoperative Pain Management**

**ESRA7-0186**

**SUFE NTANIL NANOTABS AFTER TOTAL HIP ARTHROPLASTY: A RETROSPECTIVE COHORT-STUDY**


**Background and Aims:** A multimodal approach for postoperative analgesia, combining non-opioid analgesics, locoregional anesthesia and strong opioids, is used for total hip arthroplasty (THA) in our institution. Patient-controlled analgesia (PCA) is used to allow patients to self-titrate and relieve moderate-to-severe pain. The sufentanil sublingual tablet system (SSTS) is a new oral PCA drug delivery system, intended to overcome some of the drawbacks of intravenous PCA. We retrospectively compared the postoperative pain relief and adverse events of the SSTS to the standard analgesic treatment after THA.

**Methods:** After approval of the ethical committee a retrospective cohort-study was performed comparing data from patients undergoing THA receiving SSTS (n=40) to standard analgesic treatment with parenteral and enteral opioids (n=40). We evaluated total opioid consumption, numerical rating scale (NRS) for pain and adverse events during 48 hours postoperatively.

**Results:** Baseline patient characteristics did not differ between the two groups. The median NRS-pain score 24 hours postoperative was statistically lower in the SSTS group compared to control (NRS 2 (median) vs NRS 3, p=0.0004) (Figure 1). Total intravenous morphine equivalent consumption in the SSTS group was significantly higher compared to control (p=0.0004), however groups were not different with respect to adverse events (Table 1).

**Conclusions:** This study suggests that SSTS is an effective PCA modality in patients after THA. As it is preprogrammed and noninvasive, it may overcome some of the complications of intravenous PCA. Further RCT’s are warranted to evaluate if SSTS is indeed an effective and safe alternative for the management of postoperative pain.

**Postoperative Pain Management**

**ESRA7-0121**

**CONTINUOUS TRANSVERSUS ABDOMINIS PLANE (TAP) BLOCKADE FOR POST-OPERATIVE ANALGESIA IN PATIENTS UNDERGOING ABDOMINAL SURGERY – IS THE TIDE CHANGING?**

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**Background and Aims:** Patients who undergo major abdominal surgery are at risk of developing acute post-operative pain and it is vital to ensure that they receive adequate post-operative analgesia. Continuous TAP blockade has been shown to be non-inferior to epidural analgesia as part of multimodal pain management for these patients.

Since 2013, our department has initiated the practice of continuous TAP blockade for patients who undergo abdominal surgery to address the issue of opioid-sparing post-operative pain control. Compared to epidurals, the continuous TAP blockade under ultrasound guidance has a less acute learning curve which residents/registrars would be able to perform with greater confidence. This study objective is to review the trend of continuous TAP and Thoracic Epidural Analgesia (TEA) insertion for abdominal surgery performed by residents.

**Methods:** After obtaining DSRB approval, a retrospective data collection was performed on surgical patients who received either continuous TAP blockade or TEA for major abdominal surgery from 01 Jan 2014 to 1 Jan 2016.

**Results:** 112 TEA and 84 continuous TAP blockade were performed in 2014 whilst 68 TEA and 144 continuous TAP blockade were performed in 2015 for major abdominal surgery. 27% and 33.8% of TEA were performed by junior anesthesiologists (residents, registrars or fellows) whilst 77.7% (103) and 75.4% (126) continuous TAP blockade were performed by the junior staff in 2014 and 2015 respectively.

**Conclusions:** With the introduction of TAP catheters, the number of epidurals for abdominal surgery is on the downward trend. Continuous TAP blockade is relatively easier to perform but also offer opioid-sparing analgesia.

**Postoperative Pain Management**

**ESRA7-0269**

**OBSERVATIONAL STUDY OF POST-OPERATIVE PAIN AFTER TOTAL ABDOMINAL Hysterectomy IN A DISTRICT GENERAL HOSPITAL**

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**Background and Aims:** Post-operative pain following total abdominal hysterectomy is often severe and providing adequate analgesia can be challenging. This observational study assesses various modes of analgesia for abdominal hysterectomy and their outcomes in a single district general hospital over an eight month period. Primary outcome was assessment of severity of post-operative pain. Secondary outcomes include patient satisfaction with analgesia and whether patients would recommend the current method of treatment.

**Methods:** Audit forms were distributed to staff and a telephone survey was performed to collect and analyse the data.

**Results:** 41 patients had a median age of 48 years. 15 patients (37%) had general anaesthesia only and seven patients (17%) had additional regional anaesthesia. With the former, nine patients (64%) reported moderate and five patients (36%) reported severe pain postoperatively. Three patients (42%) with general anaesthesia reported moderate pain, and one patient (14%) experienced severe pain. Average morphine usage via patient controlled analgesia after 48 hours was 74mg in the combined general and regional cohort, in comparison to 94mg with general analgesia only. Data from telephone follow up was limited...
however eight out of eleven patients reported pain one week after discharge. Four patients were not satisfied because of pain.

**Conclusions:** Retrospective review of 21 patients undergoing elective hysterectomy shows that the majority of patients (81%) experienced moderate to severe pain. Patients with additional regional anaesthesia appear to have less severe pain and analgesia use, suggesting its superiority over general anaesthesia only. We therefore suggest additional regional anaesthesia as common practice.

### Postoperative Pain Management

**ESRA7-0123**

**THE EFFECT OF POSTOPERATIVE PATIENTS CONTROLLED ANESTHESIA ON DELIRIUM IN PATIENTS WITH LIVER TRANSPLANTATION: RETROSPECTIVE STUDY**

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**Background and Aims:** Neurological complications occur frequently in patients with liver disease, with an incidence of approximately 13% to 42%. The most common clinical manifestations are changes in consciousness. The aim of this study is to evaluate the effect of postoperative patients controlled anaesthesia (PCA) on delirium in patients with liver transplantation.

**Methods:** This study retrospectively analysed patients with liver transplantation. The patients were divided into two groups: those who underwent post-operative PCA after liver transplantation and those who did not undergo postoperative PCA. The patients’ demographic data, sedation methods and complications were collected.

**Results:** A total of 204 patients were collected. Among them, 24/204 (11.8%) of delirium occurred after liver transplantation. Delirium occurred in 2/3 (6.1%) and 22/170 (12.9%) in the PCA group with liver transplantation and no PCA group, respectively. Independent risk factors for delirium are history of alcohol drinking, history of epileptic encephalopathy, and high MELD score.

**Conclusions:** In this retrospective study, the incidence of delirium in patients with liver transplantation was 11.8%, which means that many patients experienced a change in postoperative cognitive status requiring treatment. The prevalence of delirium and the mortality of post-operative delirium can be reduced if managing carefully in patients with postoperative pain with PCA.

### Postoperative Pain Management

**ESRA7-0267**

**AUDIT ON USE OF INTRAVENOUS OPIOIDS IN RECOVERY**

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**Background and Aims:** Background: Optimal analgesia in the recovery room is key in ensuring the best long-term outcome for patients.

Failure of pain management in recovery can result in several adverse outcomes having wide ranging implications on patient care.

Challenging groups include the elderly, children, patients with learning difficulties, dementia, chronic pain, neuropathic pain, and those on long-term opioids and substance abuse

**Aim:** Our aim was to establish optimal peri-operative analgesia, thereby minimising the use of intravenous opioids, delay in discharge of patients from recovery due to pain, and thus improving care and patient satisfaction.

**Methods:** A prospective audit was carried out looking into immediate postoperative pain and use of intravenous opioids in the post anaesthetic care unit at Queen Elizabeth Hospital, Woolwich. All patients above 15 years of age and all operative procedures including both emergencies and electives procedures and analgesia provided were included in the audit. Pain was assessed using verbal numerical rating scale.

**Results:** The duration of stay in the post anaesthetic care unit, i.e. recovery ranged from 30mins to 8 hours. All patients required additional analgesia, with significant use of opioids in increasing doses. We, however, did not take into account, confounding factors affecting discharge from recovery, such as awaiting ward or ITU bed.

**Conclusions:** Our audit demonstrated the need for improvement in pain management for our surgical patients. We recommended the use of a RADAR approach involving multimodal analgesia, encourage the use of evidence-based, procedure-specific postoperative pain management such as PROSPECT and re-auditing at a later date.

### Postoperative Pain Management

**ESRA7-0352**

**IMPROVING POSTOPERATIVE PAIN MANAGEMENT AFTER HAND-ASSISTED LAPAROSCOPIC NEPHRECTOMY FOR KIDNEY-CANCER WITH THE ULTRASOUND-GUIDED TRANSMUSCULAR QUADRATUS LUMBRUM (TQL) BLOCK - A RANDOMIZED CONTROLLED TRIAL**

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**Background and Aims:** Kidney-cancer patients often undergo hand-assisted laparoscopic nephrectomy. Our one-year retrospective study revealed that 67% of the patients needed substantial amounts of opioids for sufficient postoperative pain management in recovery despite a multimodal analgesic regime; i.e. 22.1±13.5 mg morphine (mean±SD). In a prospective pilot study including ten kidney-cancer patients undergoing laparoscopic hand-assisted nephrectomy presenting with severe postoperative pain (NRS > 6) in recovery, we found that bilateral USG TQL block substantially reduced pain and opioid consumption. This study aims to compare the efficacy of bilateral USG TQL block in reducing postoperative opioid consumption compared to placebo.

**Methods:** A single center, randomized, controlled and double-blinded trial with concealed allocation achieved ethics committee approval. Sixty patients undergoing hand-assisted laparoscopic nephrectomy under standardized general anesthesia with a multimodal analgesic regime will be randomized to receive either bilateral preoperative USG TQL block with 30+30 ml Ropivacaine 0.375% or isotonic saline. Primary outcome: Accumulated opioid consumption during the first 12 postoperative hours. Secondary outcomes: NRS (0-10) pain scores, total morphine consumption, time to first opioid, adverse effects, satisfaction with treatment, time to ambulation. We will be able to detect a 50% reduction in recorded opioid consumption with α=5%, β=20% and a dropout rate of 15%.

**Results:** Preliminary results, block technique and study design from our ongoing randomized trial will be presented.

**Conclusions:** The present study is powered to demonstrate whether a bilateral USG TQL block can reduce opioid consumption with clinical significance for kidney-cancer patients undergoing hand-assisted laparoscopic nephrectomy.
Results: 30 patients were identified – in 25 cases catheters were inserted electively and in 5 cases as a rescue analgesic option. A total of 13 catheters were inserted under US guidance and 18 surgically inserted. Mean pain scores at 24 and 48 hours were lower in the US group (0.91, 0.64) vs. surgical group (1.94, 1.21) (Table 1). Average opioid consumption within 1st 24 hours in the US group was 24mg, and in the surgical group 47mg. Finally patients who had a stoma or drain had a higher average opioid use over 48 hours (74.8mg vs. 36.4mg).

Conclusions: Despite small sample size – higher pain scores and opioid requirements were seen in the surgical group. Reasons for differences included unfamiliarity with procedure or equipment - resulting in catheter kinking or leaking. In response it has led to: development of local guidelines, standardisation of equipment, insertion training for both anaesthetists and surgeons, and an audit proforma enabling regular service assessment.

Postoperative Pain Management

ESRA7-0028

PERI-NEURAL DEXMEDETOMIDINE AS AN ADJUVANT TO BUPIVACAINE INDUCED THORACIC PARAVERTEbral BLOCK IN PATIENTS UNDERGOING THORACOTOMY

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Background and Aims: Thoracic paravertebral block is an effective alternative to thoracic epidural block

Methods: Patients were divided into two groups: control bupivacaine group (group B, n=15) patients in this group received an initial loading preoperative dose of 20 ml bupivacaine 0.5% (100mg) plus 0.5 ml normal saline perineurally. Top up doses of 10 ml bupivacaine 0.25% plus 0.25 ml normal saline were injected in the paravertebral catheter on patient request and when the visual analogue score (VAS) exceeds 3 peri-neural Dexmedetomidine group (group B-peri-Dex,n=15) patients in this group received an initial loading dose of 20 ml bupivacaine 0.5% (100mg) plus 0.5 ml Dexmedetomidine perineurally. Top up doses of 10 ml bupivacaine 0.25% plus 0.25 ml dexmedetomidine were injected in the paravertebral catheter on patient request and when VAS score exceeds 3.

General anaesthesia was induced, vitals, average consumption of anesthetics and analgesics, side effects and VAS were compared in the two groups.

Results: systolic and diastolic pressure on incision were significantly lower in the paravertebral catheter on patient request and when VAS score exceeds 3.

Conclusions: peri-neural Dexmedetomidine thoracic paravertebral catheter significantly increases duration of analgesia.

Postoperative Pain Management

ESRA7-0210

INTRATEHALK MORPHINE IN HEPATOBILIAR SURGERY: A FIVE YEARS EXPERIENCE

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Background and Aims: Hepatobiliary and Pancreatic surgery (HBPS) is performed in specialized centres, because of its specificities and complications. Pain control is a vital component of postoperative care. Once postoperative coagulation and bleeding disorders are common, an epidural catheter may not be the safest option. The aim of this study is to evaluate, using ITM as the main analgesic strategy, the need for opioid rescue analgesia and the presence of any adverse effects (respiratory depression (RD), nausea/vomiting and pruritus), in up to 48 hours after surgery.

Methods: Retrospective analysis was performed from 2012 to 2016 in patients submitted to HBPS, including transplants. Due to after surgery mechanical ventilation, 25 patients were excluded, with a final total of 429. Nonparametric Mann-Whitney test, Fisher’s exact test and Spearman’s correlation coefficient were used. Data were analyzed using SPSS®.

Results: A statistical significant correlation was found between the ITM dose and not only the patients’ height, but weight and body surface area (P<0.001). The immediate postoperative pain score was mild or none in 374 patients. Only 18% patients needed rescue opioid dose. RD was not verified with ITM doses under 0.5 mg, reporting only 3 cases in doses between 0.3 to 0.45 mg and 1 above 0.45 mg. 33 patients had vomiting and 9 pruritus.

Conclusions: We can conclude that ITM is a successful postoperative analgesia up to 48 hours after HBPS. RD is a concern but has a low frequency. ITM is an option for postoperative analgesia of HBPS, with a reduce number of adverse effects.

Postoperative Pain Management

ESRA7-0368

CONTINUOUS INFUSION EPIDURAL ANALGESIA VERSUS INTRAVENOUS PATIENT CONTROLLED ANALGESIA IN THE ELDERLY AFTER MAJOR ABDOMINAL SURGERY

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Background and Aims: Epidural analgesia remains the gold-standard for postoperative pain control in patients undergoing major abdominal surgery. However, it can lead to complications, has contraindications, and occasionally is technically difficult to perform. Intravenous patient controlled analgesia (IV-PCA) has been suggested as an alternative.

This retrospective study compared the effectiveness on postoperative pain and safety related to continuous infusion epidural analgesia (CIEA) and IV-PCA, after major abdominal surgery in the elderly patient.

Methods: After the approval of local Ethics Committee, we conducted a retrospective review of patients who had received CIEA (local anesthetics and opioids) and IV-PCA (morphine) after major abdominal surgery during 2016.

Demographic characteristics, American Society of Anesthesiologists physical status, numeric pain rating scale in rest, movement, coughing, and surgical wound and analgesia related side effects were all analyzed, during 48-hour postoperative period.

Results: 92 patients older than 65 years were analysed (58 received CIEA and 34 IV-PCA). The mean pain values referred at 24 and 48 hours in the 4 categories was lower in the CIEA group, and the difference was statistically significant in the evaluation of resting pain (in the first 24hours, p=0.011), surgical wound (both 24 and 48hours, p=0.001) and coughing (p=0.022 and p=0.032, respectively).

The incidence of side effects (mostly nausea/vomiting, headache and pruritus) was 34.5% in patients undergoing CIEA and 11.8% in patients undergoing IV-PCA.

Conclusions: We found that IV-PCA was inferior to CIEA for analgesic efficacy after major abdominal surgery in elderly patients, however there were fewer reported side effects.

Postoperative Pain Management

ESRA7-0363

EPIDURAL BUPIVACAINE 0.2% VERSUS 0.1% IN POSTOPERATIVE ELDERLY PATIENT AFTER TOTAL KNEE ARTHROPLASTY

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Background and Aims: Thoracic paravertebral block is an effective alternative to thoracic epidural block.

Methods: Patients were divided into two groups: control bupivacaine group (group B, n=15) patients in this group received an initial loading preoperative dose of 20 ml bupivacaine 0.5% (100mg) plus 0.5 ml normal saline perineurally. Top up doses of 10 ml bupivacaine 0.25% plus 0.25 ml normal saline were injected in the paravertebral catheter on patient request and when VAS score exceeds 3.

Conclusions: peri-neural Dexmedetomidine thoracic paravertebral catheter significantly increases duration of analgesia.

Postoperative Pain Management

ESRA7-0210

INTRATEHALK MORPHINE IN HEPATOBILIAR SURGERY: A FIVE YEARS EXPERIENCE

da Câmara L. Perry¹, Ferreira A.M.¹, Aguiar F.¹, and Aguiar M.I.² ¹Centro Hospitalar Lisboa Central, Anaesthesiology, Lisbon, Portugal, ²Centro Hepatobiliar-pancreático e de Transplantação - Hospital Curitiba Cabral, Anaesthesiology, Lisboa, Portugal.

Background and Aims: Hepatobiliary and Pancreatic surgery (HBPS) is performed in specialized centres, because of its specificities and complications. Pain control is a vital component of postoperative care. Once postoperative coagulation and bleeding disorders are common, an epidural catheter may not be the safest option. The aim of this study is to evaluate, using ITM as the main
Background and Aims: Postoperative pain control after total knee arthroplasty (TKA) is a concern for Anesthesiologists, especially in the elderly population, where physiological changes may determine different patterns of pain and side effects.

This study compared the analgesic efficacy and safety of continuous intraarticular analgesia (CIA) with ropivacaine 0.1% and 0.2% combined with morphine and droperidol after TKA in the elderly patient. We intended to identify the option that guarantees greater analgesic comfort without compromising patient safety.

Methods: After the approval of local Ethics Committee, we conducted a retrospective review of 104 patients older than 65 years who were submitted to TKA under spinal anesthesia and postoperative CIEA with: ropivacaine 0.1%, morphine 20mcg/mL and droperidol 10mcg/mL (group A, n=48) versus ropivacaine 0.2%, morphine 20mcg/mL and droperidol 10mcg/mL (group B, n=56).

Demographic characteristics, American Society of Anesthesiologists physical status, numeric pain rating scale in rest, movement, coughing and surgical wound and analgesia related side effects were all analyzed, during 48-hour postoperative period.

Results: The mean pain values referred in the three categories during the first 48 hours were inferior in the group B (statistically significant at rest and movement: p=0.008 and p=0.011, respectively).

The incidence of side effects were not significantly different between the two groups.

The demographic characteristics and ASA classification did not significantly influence this results.

Conclusions: This results suggest that CIEA of ropivacaine 0.2%, morphine (20 mcg/mL) and droperidol (10 mcg/mL) promotes better analgesic control after TKA in elderly patients, than ropivacaine 0.1%, without significantly increase of related side effects.

Postoperative Pain Management

ESRA7-0256

REVERSE POLARITY SHOULDER REPLACEMENT SURGERY: ANALGESIA AUDIT AND DAY CASE SURGERY QUALITY IMPROVEMENT PROJECT

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Background and Aims: Following a feasibility study (presented at ESRA Congress 2015), we started a quality improvement project aiming to perform reverse polarity shoulder replacement (RSR) surgeries as day-cases.

Methods: We designed a new patient information leaflet and a post-operative analgesia protocol including strong opioid drugs for the patients to take home. A telephonic follow-up to be carried out by the Pain Management team was put in place. Following this, patients presenting to clinic were offered the option of day-case surgery. The project was approved by the hospital audit department.

Results: 31 elective RSRS have been done since 01/02/2016. 9 were done as day-cases and were sent home using the agreed analgesia protocol. 2 patients stayed overnight due to social issues. Others who stayed overnight were already posted for in-patient surgery prior to introduction of the day-case project.

All cases had a pre-incision interscalene block. Our previous audit found variation in practice with regard to volume & concentration of LA and whether ultrasound landmark approach was used, however success rate was and remains high.

There was a high rate of patient satisfaction with the procedure and quality of pain relief. 1 patient had an episode of PONV and 3 day case patients reported a delay in getting discharge medication.

Conclusions: Day-case RSRs can be safely offered to all patients without social care issues or significant comorbidities.

Postoperative Pain Management

ESRA7-0165

ULTRASOUND-GUIDED (USG) TRANSMUSCULAR QUADRATUS LOMBORUM BLOCK FOR UTERINE CANCER PATIENTS UNDERGOING TOTAL LAPAROSCOPIC HYSTERECTOMY (TLH). A DOUBLE BLIND, RANDOMISED, PLACEBO CONTROLLED TRIAL

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Background and Aims: TLH is a very common gynaecological procedure. A one-year retrospective survey revealed a vast opioid consumption in this category of patients suffering from uterine cancer of approximately (mean±SD) 37.5±8.8 mg of oral morphine in the first 24 postoperative hours despite a multimodal analgesic regimen consisting of preoperatively administered oral Ibuprofen, Paracetamol, Dexamethasone, and subsequent intravenous Sufentanil 0.5-0.8 micrograms/kilo prior to emergence.

This study aims to evaluate the efficacy of bilateral TQL block in reducing postoperative morphine consumption and pain.

Methods: A single center, randomised, controlled and double-blinded trial with concealed allocation achieved ethics committee approval. Eighty-eight patients scheduled for TLH will be randomized to receive either bilateral USG TQL block with 60 ml Ropivacaine 0.375% or isotonic saline prior to surgery. Primary outcome: Accumulated opioid consumption during the first 24 postoperative hours. Secondary outcomes: NRS (0-10) pain scores at 6 and 12 hours, total morphine consumption, time to first opioid, adverse effects, satisfaction with treatment, time to ambulation. We will be able to detect a 50% reduction in recorded opioid consumption with α=5%, β=20% and a dropout rate of 15%

Results: Preliminary results and study design from our ongoing randomised study will be presented.

Conclusions: The present study is powered to demonstrate whether bilateral USG TQL block can reduce postoperative opioid consumption and pain with clinical significance in patients undergoing TLH. Further studies will reveal whether this intervention also can reduce the development of chronic pain and if adjuvants or catheters could be a future regional anaesthesia strategy.

Postoperative Pain Management

ESRA7-0397

INTRODUCTION OF INTRAVENOUS LIDOCAINE INFUSIONS AT A DISTRICT GENERAL HOSPITAL FOR THE MANAGEMENT OF ACUTE PERI-OPERATIVE PAIN

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Background and Aims: Intravenous lidocaine is an established treatment modality for the management of chronic pain. However, its use peri-operatively is sparse within the National Health Service despite an increasingly robust evidence base and gaining popularity elsewhere. We aimed to increase awareness, standardise local practice and monitor safety of this analgesic technique.

Methods: Full literature review and summation of evidence presented to anaesthetic department.

Liaison with pain team, recovery and critical care to write protocol that would enable safe extended infusions outside of operating theatre.

Direct monitoring of usage for administration problems, side effects and toxicity.

Departmental survey of all consultant and training grade anaesthetists to assess opinion and trends in usage. Data is presented as median [range].

Results: Logbook compiled of 16 cases of lidocaine infusions used for 2.5 [1.5-4.0] hours without complication.

The survey received 37 responses, 78% of whom had no previous experience with lidocaine infusion in peri-operative care. 30% of respondents
increased their usage since introduction but only 11% had used it more than 2 times. 86% of respondents identified patient groups they believe it would benefit yet 46% continued to have no experience with its usage.

Barriers reported include inability to continue infusions outside theatre, lack of familiarity and insufficient evidence.

**Conclusions:** Initial safety assessment is promising with infusions up to 40 hours used in our centre. Most anaesthetists surveyed lack experience with intravenous lidocaine but are aware of those it can benefit. To help address barriers to usage, training for recovery and critical care nurses is underway and a protocol summary is available in theatre.

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**Postoperative Pain Management**

ESRA7-0392

**PAIN AND NAUSEA DURING FIRST 7 DAYS AFTER DISCHARGE TO HOME FROM DAY CASE BREAST SURGERY**

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**Background and Aims:** Breast cancer is the most common invasive malignancy n females. Postoperative pain control after breast surgery could be challenging.

Little is known about the actual effectiveness of pain control in these patients after discharge from hospital. Our objective was to investigate the frequency and severity of postoperative pain & nausea during first 7 postoperative days (POD).

**Methods:** It was a prospective audit. After approval from hospital audit committee, 44 female patients above 18y for day case breast surgery were included during January–April 2016 period. Patients were given symptom diary to record pain and nausea scores for first 7 postoperative days. Numerical rating scale (NRS) was used for measuring pain. NRS-Pain of > 3 was considered significant. NRS-Nausea of > 3 was considered significant modified nausea intensity scoring was used for recording nausea.

**Results:** 44 patients returned completed forms. On POD zero, 68.2% & 34.6% of patients had Pain NRS of > 3 on movement & rest respectively whereas it dropped to 17.1% on POD 7. Pain scores were significantly higher than 3 during postoperative day 0–2 (4.9±2.71, 4.4±2.63, and 3.9±2.67 respectively). Mean pain scores were significantly higher on movement than rest during all 7 days. Pain scores were higher in patients with preexisting pain conditions, mammoplasty and lipofilling.

Maximum incidence of nausea was 31.8%, which occurred on POD 0 followed by another peak of 29.5% on POD2. Severe nausea was uncommon after POD 2.

**Conclusions:** Pain after day case breast surgery was significant during first 3 postoperative days. Significant nausea was uncommon after POD 2.

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**Postoperative Pain Management**

ESRA7-0328

**POST-OPERATIVE ANALGESIA LEVEL ASSESSMENT AFTER TOTAL KNEE REPLACEMENT EVALUATED BY INFRARED THERMOGRAPHY**

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**Background and Aims:** Total knee replacement is associated with moderate to severe postoperative pain. Femoral nerve block and adductor canal block are used as a component of multimodal analgesia. Thermography is a technique whereby temperature can be accurately measured over a skin surface at a specific time. It is not known whether the extent of the temperature change can be used to predict block success and to evaluate postoperative pain. Evaluate skin temperature changes in operative knee after femoral nerve blockade and adductor canal block, and evaluate whether these changes in temperature correlate with a sufficient level of analgesia.

**Methods:** Patients undergoing TKR under spinal anesthesia were randomized into the one of two groups. Patients of the first group received 0.375% Ropivacaine in continuous femoral nerve block catheter, second group–in adductor canal catheter as a component of multimodal post-operative analgesia. Post-operative rest pain intensity was measured 6–8 hours after surgery before femoral or adductor infusion and 30 minutes after procedure with NRS. Temperature in the operative knee was measured with Flir termal camera before analgesic administration and every 5 minutes in 30 minutes time interval.

**Results:** Two groups were compared: 15 patients in AKB group and 10 patients in FNB group. Mean rank of NRS scale in AKB group before medications administration 6.6,30 minutes later 2.6 in FNB group- before 6.8,30min after medications administration 4.1. The mean temperature’s difference between the outlet temperature and every fifth minute temperature at 30 minute period in AKB patients group 1.3°C in FNB group 1.53°C.

**Conclusions:** Study do not show correlation between pain intensity changes and temperature changes.

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**Postoperative Pain Management**

ESRA7-0091

**RECTUS SHEATH BLOCK VERSUS INTRAVENOUS LIDOCAINE INFUSION FOR PAIN MANAGEMENT AFTER LAPAROSCOPIC SUBTOTAL GASTRECTOMY: A PILOT STUDY**

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**Background and Aims:** Rectus sheath block (RSB) and intravenous lidocaine infusion (IVLI) can provide effective postoperative analgesia after abdominal surgery. The aim of this study is to evaluate the effects of these two analgesic techniques on postoperative opioid requirement after laparoscopic subtotal gastrectomy.

**Methods:** Thirty patients were enrolled in this prospective pilot study and randomly allocated to the RSB group (n = 10), the IVLI group (n = 10) or the control group (n = 10). In all patients, 2 g of intravenous propacetamol was given after anesthesia induction and 20 mg of intravenous nefopam was given every 8 hours during the first 48 post-operative hours. Patient controlled analgesia with fentanyl was used (fentanyl 0.1 μg/kg/mL, basal infusion = 3 mL/hr, bolus 3 mL, lockout time 15 min) and 50 μg of intravenous fentanyl was used as a rescue analgesic. The primary endpoint was the cumulative fentanyl consumption per body weight during the first 48 post-operative hours [median (intertquartitle range)], and the second endpoints were somatic and visceral abdominal pain scores at rest using verbal rating scale (VRS, 0–10).

**Results:** Cumulative fentanyl consumption per body weight after 48 hours was 20.63 (15.36-23.40) μg/kg in the control group, 12.54 (8.00-18.67) μg/kg in the RSB group and 15.97 (8.02-17.54) μg/kg in the IVLI group (P = 0.048). There was no significant difference in post-operative pain scores between groups.

**Conclusions:** This pilot study provides information for planning future studies of effectiveness of RSB and IVLI. Preliminary results indicate RSB and IVLI may lead to the reduction in post-operative opioid requirement.

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**Postoperative Pain Management**

ESRA7-0414

**PERIOPERATIVE PAIN MANAGEMENT IN PATIENT WITH PROGRESSIVE SUPRANUCLEAR PALSY (PSP) - CASE REPORT**

Kuppuswamy Mohanraj A. North West and North Wales Paediatric Transport Service Faculty of Life Sciences, Anaesthesia, Wigan, United Kingdom.

**Background and Aims:** We present successful management of preoperative pain relief in a patient with progressive supranuclear palsy (PSP). A 64 year old female with progressive PSP was listed for elective removal of metal work and insertion of pseudo prosthesis in the shoulder. Progressive supranuclear palsy (PSP) also known as Steele-Richardson-Olszewski syndrome is a neuro degenerative disorder and is called a tauopathy due to accumulation tau proteins in the brain. Life expectancy is usually 6 years from the time of onset (range 2–17 years) with pulmonary complications being the most common cause of death due to immobility.

**POTENTIAL ISSUES WITH PSP:**

- Progressive Neck dystonia
Postoperative Pain Management

ESRA7-0211

POSTOPERATIVE PAIN MANAGEMENT IN PATIENTS PRESENTING FOR LOWER LIMB AMPUTATION AUDIT OF CURRENT PRACTICE IN TERTIARY REFERRAL CENTRE

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Background and Aims: St George’s University Hospital is a tertiary referral centre for complex vascular and trauma surgery. There are around 100 lower limb amputations performed each year. Our aim was to investigate the quality of postoperative pain control and analgesic regimes used by our anaesthetists with a view to propose a formal pain management pathway as recommended by National Confidential Enquiry into Patient Outcome and Death.

Methods: Ninety-four patients underwent lower limb amputation in 2015. A retrospective audit of 50 randomly selected patient’s records was undertaken. The data regarding highest pain scores for 5 postoperative days was collected and postoperative analgesia was reviewed. Pain scores were analysed based on a numerical rating scale of 0–10 (0 = no pain, 1 = mild, 2 = moderate on movement, 3 = severe on movement, 4 = continuous).

Results: Forty-three patients (86%) received patient controlled analgesia (PCA) or strong oral opioids in postoperative period. Sciatic peripheral nerve block (PNB) catheter was inserted in 7 patients (14%). Patients in this group consistently reported lower pain scores throughout the postoperative period and communicated lack of pain more than 70% of the time. The local anesthetic infusions were discontinued on third postoperative day resulting in recurrence of pain in one patient.

Conclusions: Regional anaesthesia provided superior pain relief in our patients. A literature review confirmed that it should be a gold standard for pain management in these patients. We have now developed a formal pain management pathway for lower limb amputations with sciatic PNB catheter being an integral part of it.

Postoperative Pain Management

ESRA7-0024

INTRAOPERATIVE NEFOPAM REDUCES ACUTE POSTOPERATIVE PAIN IN PATIENTS UNDERGOING LAPAROSCOPIC GASTRECTOMY UNDER TOTAL INTRAVENOUS ANAESTHESIA: A PROSPECTIVE, DOUBLE-BLIND, AND RANDOMIZED STUDY

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Background and Aims: We assessed whether perioperative nefopam could relieve acute postoperative pain after laparoscopic gastrectomy by decreasing intraoperative remifentanil use.

Methods: The 60 enrolled patients were randomly assigned to either a control (n = 32) or nefopam (n = 28) group. We gave 100 ml of normal saline only or 20 mg of nefopam mixed in 100 ml normal saline, on two occasions - after the induction of anesthesia and at the end of surgery - to the control and nefopam group, respectively. The cumulative infused volume of intravenous patient-controlled analgesia (PCA), incidence of rescue analgesic medication, and a numerical rating scale (NRS) for postoperative pain were evaluated with total remifentanil consumption.

Results: The mean infusion rate of remifentanil was significantly lower in the nefopam group (0.13 ± 0.06 μg/kg/min) than in the control group (0.13 ± 0.06 μg/kg/min) (P < .001). The NRS in the post-anesthetic care unit was significantly lower in the nefopam group than in the control group (3.8 ± 1.1 vs. 4.8 ± 1.4, P = 0.012). Intravenous PCA was used less by the nefopam group compared to the control group until postoperative 6 h (12.2 ± 4.9 ml vs. 16.2 ± 6.6 ml, P = 0.012). Also, during this time period, fewer patients in the nefopam group received rescue analgesic compared to those in the control group (78.6% vs. 96.9%, P = 0.028).

Conclusions: Intraoperative nefopam was helpful for relieving acute postoperative pain immediately after laparoscopic gastrectomy. Reduction of intraoperative remifentanil consumption seemed to contribute to reduced acute opioid tolerance.

Postoperative Pain Management

ESRA7-0440

OVERCOMING THE LANGUAGE BARRIER TO IMPROVE POST-OPERATIVE ANALGESIA COMPLIANCE IN KENYA - A QUALITY IMPROVEMENT PROJECT

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Background and Aims: Charitable organizations may play a significant role in the delivery of surgical care in the developing world. The majority of the volunteers come from English speaking countries and are unlikely to be fluent in the local language. On the Kenyan Orthopaedic Project (KOP) we identified that compliance of postoperative analgesia was poor and affected by the language barrier. Our aim was to improve compliance by using a short video in the local language of Swahili explaining how to take analgesia.

Methods: Setting: KOP, Nyahuru Hospital, Laikipia County, Kenya. 20 trauma orthopaedic cases over 6 days on KOP in November 2016. In the post-operative recovery area, all patients were given packs of analgesia.
containing paracetamol, ibuprofen and codeine, along with verbal instructions in Swahili of how to take them.

We assessed analgesia compliance on ward rounds post-operatively by inspecting blister packs and using a translated questionnaire. The intervention introduced on day 3, was a short video, in Swahili, played to patients from a smartphone on the evening of, and day after surgery, explaining how to take the analgesia.

Results: 20 cases. Intra-operatively, all patients received regional anaesthesia, combined with general anaesthesia in 2 cases.

Pre-intervention compliance: 0/4 patients (0%)
Post-intervention compliance: 10/16 (63%)

Conclusions: Prior to intervention, patients were poorly compliant with post-operative analgesia. A video in the local language, shown twice to patients, improved post-operative analgesia compliance after orthopaedic surgery. Videos on smartphones would appear to be a useful tool for similar projects facing challenges due to a language barrier in the developing world.

Postoperative Pain Management

ESRA7-0009

RETROSPECTIVE STUDY OF THE EFFECTS OF AN EPIDURAL BLOCK ON POSTOPERATIVE PAIN IN CERVICAL SPINE SURGERY

Nishiyama T., Saitama, Japan.

Background and Aims: For postoperative analgesia in cervical spine surgery, intravenous or suppository analgesics are usually used. In this retrospective study, we evaluated the effects of preoperative epidural block on postoperative pain in cervical laminoplasty.

Methods: Thirty-two patients with standard care (control group) and 34 patients who received preoperative epidural block (epidural group) aged 40 to 80 with ASA I or II in cervical laminoplasty were retrospectively enrolled. We have standard perioperative protocol in spinal surgery. All patients gave informed consent for presentation with the consent of anesthesia, and the protocol was approved by the ethics committee. Anesthesia was induced with midazolam, propofol, fentanyl and vecuronium, and maintained with desflurane and remifentanil. At the end of surgery, all patients received acetaminophen 1000 mg and furbiprofen 50 mg. In the epidural group, an epidural block with 1% lidocaine 2 mL, 1% ropivacaine 1 mL with saline 3 mL was performed at C6/7 before surgery. Postoperative rescue analgesia was 1. intravenous flurbiprofen, 2. diclofenac suppository, and 3. intravenous pancuronium with 1 hour interval when pain was rated as more than 5 in 10 scale (VAS score). VAS score, number of rescue postoperative analgesia, nausea, vomiting, and headache, and vital signs in postoperative 24 hours were compared between the groups.

Results: Vital signs, number of nausea, vomiting, and headache were not different among the groups. VAS score and number of rescue analgesia were significantly lower in the epidural block.

Conclusions: Preoperative epidural block was useful for postoperative analgesia in cervical laminoplasty.

Postoperative Pain Management

ESRA7-0059

CONTINUOUS INTERPECTORAL BLOCK IS BETTER THAN INTRAVENOUS ANALGESIA AFTER BREAST SURGERY?

de la Tabla R. Ortiz, Gomez P., Moreno M.D., Pérez C.V., Sánchez I., and Echevarría M. Valme University Hospital, Anesthesiology. Seville, Spain.

Background and Aims: To compare the analgesic efficacy of continuous intraperitoneal block (BIPC) versus intravenous analgesia (IV) after breast surgery.

Methods: Prospective, comparative and randomized study of women 18–75 years, ASA I-III, programmed to breast cancer surgery. In group 1 (BIPC), after induction of general anesthesia, an ultrasound guided interpectoral catheter was placed and 0.5% ropivacaine 30 mL was administered. If heart rate and blood pressure increased > 15% after incision, intravenous fentanyl was administered 1 mcg kg⁻¹, repeating doses if necessary. In postoperative period, perfusion of ropivacaine 0.2% 5 mL h⁻¹; PCA bolus 5 mL /30 minutes per 24 hour through catheter and rescue analgesia with 5 mg subcutaneous morphic chloride. In group 2 (IV) after induction of general anesthesia intravenous fentanyl was administered if necessary as in another group. Metamizol 2 gr was given with dexketoprophene 50 mg and ondansetron 4 mg followed by perfusion of metamizol 4%, tramadol 0.2% and ondansetron 0.08% 2 mL h⁻¹; PCA bolus 2 mL /20 min 24 hours. Same analgesic rescue. The main variables were pain at rest and movement, according to simple verbal scale (0–10) and rescue analgesia required at resuscitation discharge, 12 and 24 hours.

Results: 137 patients were included: 81 group 1 (59.12%) and 56 group 2 (40.87%). There were no significant differences in analgesia between groups, but intravenous fentanyl doses p < 0.05. There were no significant differences in rescue analgesia in resuscitation room (10% lower in group 1).

Conclusions: Both techniques provided effective postoperative analgesia, but BIPC group required significantly less intraoperative fentanyl.

Postoperative Pain Management

ESRA7-0307

SAFETY OF BILATERAL PARAVERTEBRAL BLOCK (BPVB) FOR AUGMENTATION MAMMOPLASTY

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Background and Aims: Paravertebral block (PVB) was first described in 1905 by H. Sellheim from Leipzig. It was popularised in the 1990s by Lonnqvist and Richardson. PVB has been used most often for unilateral procedures. Its bilateral application can be safe, too, especially when being performed under ultrasound guidance. The purpose of this study was to assess the safety of thoracic BPVB and estimate the risk percentage of complications (including pneumothorax, blood vessel puncture, toxicity of local anaesthetics, hypotension, bradycardia). This work aimed at highlighting the safety of ultrasound-guided thoracic BPVB.

Methods: The study involved 90 patients who underwent general anaesthesia and bilateral PVB (at the Th4/Th5 level). For paravertebral block, 2x7 - 10 mL 0.5% bupivacaine with adrenaline and 2x 4 mL 2% lidocaine were injected. Possible complications were evaluated on the zero, first and second postoperative day in medical documentation.

Results: Ultrasound-guided bilateral PVB was found to reduce the risk of complications. No complications were observed in the anaesthetised patients.

Conclusions: In the available data, the risk of complications is being most often estimated as follows: blood vessel puncture 3.8%, hypotension 4.6%, pleural puncture 1.1%, and pneumothorax 0.5%. The risk is certainly reduced when BPVB is performed under ultrasound guidance where anatomical structures of the paravertebral space, needle track and site of anaesthetic injection are shown. Verification is needed for the re-assessment of possible complications in this technique of anaesthesia being performed under ultrasound guidance.

Postoperative Pain Management

ESRA7-0343

CUTANEOUS BRANCHES OF INTERCOSTAL NERVES BLOCK ASSOCIATED WITH PECTORAL NERVE BLOCK IN MASTECTOMIES: AN EFFECTIVE TECHNIQUE FOR PERIOPERATIVE PAIN CONTROL

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Background and Aims: Ultrasound-guided block of the cutaneous branches of intercostal nerves associated with pectoral nerve block could be an effective technique for pain relief in mastectomies. The aim of this study is to evaluate the efficacy of this block reducing the perioperative pain.

Methods: We retrospectively analysed patients who underwent a mastectomy between 2014–2015. One group received the nerve block while the other group didn’t. We used levobupivacaine 0.3% 15 mL between pectoral minor and external intercostal muscles, 25 mL between serratus and external intercostal muscles, 1 mL c m g r k g 1 mL with saline 3 mL was performed at C6/7 before surgery. Postoperative rescue analgesia was 1. intravenous flurbiprofen, 2. diclofenac suppository, and 3. intravenous pancuronium with 1 hour interval when pain was rated as more than 5 in 10 scale (VAS score). VAS score, number of rescue postoperative analgesia, nausea, vomiting, and headache, and vital signs in postoperative 24 hours were compared between the groups.

Results: Vital signs, number of nausea, vomiting, and headache were not different among the groups. VAS score and number of rescue analgesia were significantly lower in the epidural block.

Conclusions: Preoperative epidural block was useful for postoperative analgesia in cervical laminoplasty.
We included 47 patients. 19 without block (group A) and 28 with block (group B). Groups were similar in terms of age, weight and height. Differences between the intraoperative dose of fentanyl were observed (p=0.03). Group A received a mean of 0.73 mcg/Kg of fentanyl more than group B (IC 95%: 0.07-1.39). There were also statistically significant differences in the number of patients who needed morphine for postoperative pain control: Group A received morphine in 71% (n=10) of the patients and group B 29% (n=4) (p=0.005). There were statistically significant differences between inpatient stay (p=0.003). Group A inpatient stay was a mean of 1.2 days longer than those of group B (IC 95%: 0.4-1.9).

Conclusions: The anterior and lateral branches of intercostal nerves block plus pectoral block are effective analgesic techniques in breast surgery. In our study, they reduced the opioid requirements and the inpatient stay on mastectomy.

Postoperative Pain Management
ESRA7-0288

ULTRASOUND GUIDED ANTERIOR QUADRATUS LUMBORUM BLOCK L2 LEVEL SAFE APPROACH FOR POST-OPERATIVE ANALGESIA FOR LAPAROTOMY- CASE REPORT.
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Background and Aims: Ultrasound guided Trans-muscular Quadratus Lumborum (TQL) block is a variant of the Quadratus lumborum (QL) block used for post-operative analgesia. Two recognized techniques of TQL block are a lower approach (L4) and sub-costal approach near the 12th rib.1-2 Using the lower approach we reported quadriiceps paresis in a patient.3 On performing TQL technique at mid-level for analgesia for laparotomy, this adverse event was prevented.

Methods: A 68 yr old male with ASA 1, scheduled for midline incision laparotomy, provided informed consent for bilateral continuous TQL block with multimodal analgesia. Prior to extubation in a lateral position, a probe was placed transversely, above the L2 transverse process and a 18g Touhy needle was advanced anteriorly to reach the anterior thoraco lumbar fascia, which was confirmed by saline injection. Then 20ml of 0.375% ropivacaine was administered followed by a catheter insertion for infusion with 0.2% Ropivacaine at 5 ml/h for 48 hrs. The same was performed on the other side.

Results: In recovery the patient was pain free, with dynamic pain scores of 0 and 2 on arrival and 1 after 1 hr. On day 1 he required 480mcg of Fentanyl and 1g paracetamol orally. On day 2 he consumed 25mg of Oxycodeone and was discharged on day 4 with no adverse events. Utilising this technique, a prospective randomised trial is being conducted.

Conclusions: Performing the TQL block at L2 level may be safer, providing adequate analgesia. Randomised trials are needed on efficacy of this block.

Postoperative Pain Management
ESRA7-0458

PECTORAL (PECSI & PECSII) BLOCKADE AND BLOCKADE OF CUTANEOUS BRANCHES OF THE INTERCOSTAL NERVES IN THE MID-AXILLARY LINE (BRILMA) FOR NON-RECONSTRUCTIVE BREAST SURGERY (NRBS)
Salazar Aguirre J.C., Blanco Vazquez G., Oses Marcaida A., Bedmar Cruz M.D., and Olarra Nuel J. Hospital Universitario de Fuenlabrada, Anestesiologia-Reanimacion y Terapéutica del dolor, Madrid, Spain.

Background and Aims: Peripheral nerve blocks are currently being used to manage the pain for breast surgery. The main objective of this study is to compare the effectiveness of PECs and BRILMA blocks in the NRBS.

Methods: An observational retrospective study in 22 patients who underwent NRBS under general anesthesia and ultrasound guided peripheral blockade was conducted. 9 patients were treated with PECs and 13 with BRILMA. To perform the blockade, 20cc of levobupivacaine 0.5% were used. The blockade efficacy was assessed by numerical rating scale (NRS) 30 minutes after surgery and before discharge from recovery room (RR). Less than 3 is consider effective and ≥3 is consider ineffective. Furthermore, the need of rescue treatment and adverse effects (nausea/vomiting) were evaluated.

Results: PECs block showed an effective control (NRS <3) in 78% of patients and ineffective control (NRS ≥3) in 22% of cases at 30 minutes. Before discharge the effectiveness was 89% and the ineffectiveness was 11%. The BRILMA block effectiveness at 30 minutes was 62% and 38% was ineffective. In this group, 69% of patients had an effective pain control and in 31% of the patients showed to be ineffective. The need of opioids was 18% in the PECs group and 23% in BRILMA group. The adverse effects were seen in 9% of all groups.

Conclusions: We concluded that both blockades are effective. In this review the PECs block was superior to the BRILMA block in terms of pain control. There was no difference regarding adverse effects.

Postoperative Pain Management
ESRA7-0239

COULD THE ULTRASOUND-GUIDED QUADRATUS LUMBORUM BLOCK TYPE 2 BE A VAILABLE ALTERNATIVE TO EPIDURAL ANALGESIA FOR POSTOPERATIVE PAIN RELIEF IN LAPAROSCOPIC ABDOMINAL SURGERY? CASE REPORT
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Background and Aims: Although epidural analgesia is commonly consid-
ered the gold standard for postoperative pain management in abdominal surgery, there is increasing evidence in literature that less invasive, alternative regional techniques, such as the ultrasound-guided Quadratus lumborum block type 2 (US-QLB 2) could be as effective as epidural analgesia, in particular after laparoscopic surgical procedures.

Methods: A 52 year-old patient, ASA 2, underwent laparoscopic right hemicolectomy. Written informed consent was obtained. After induction of general anaesthesia, we performed the US-QLB 2 by injecting 20 ml of 0.375% Levobupivacaine for each side, in the fascial plane between quadratus lumborum and latissimus dorsi muscles. Before the end of surgery, 1 g of acetaminophen and Ketorolac 30 mg were intravenously administered.

Results: Intraoperative hemodynamic stability was obtained. In the first 24 hours after surgery, patient reported a prolonged pain relief. Only 3 g of acetaminophen and ketorolac 90 mg were administered, without opioids needng. No discomfort and complications were recorded postoperatively.

Conclusions: This case report suggested that US-QLB 2 could provide long-lasting analgesia and improve visceral pain control, likely due to extension of local anaesthetic into the paravertebral space. The spread to the thoracic paravertebral space is believed to result from the embryonic origin of the QL and PM muscles in the thoracic cage and the continuation of the transversal
fascia with the endothoracic fascia at the level of the arcuate ligaments at the diaphragm. Further studies should be needed to confirm if this technique may be considered a safe and effective alternative to epidural analgesia in laparoscopic abdominal surgery.

Postoperative Pain Management

ESRA7-0174

THE ULTRASOUND-GUIDED ADDUCTOR CANAL BLOCK COMBINED WITH IPACK FOR MOTOR SPARING ANALGESIA TO THE KNEE: IS IT REALLY POSSIBLE?

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Background and Aims: Total Knee arthroplasty (TKA) is often associated with severe postoperative pain, which may compromise rehabilitation and hospital discharge. Femoral nerve block provides effective analgesia but is associated with postoperative quadriceps muscle weakness, which may limit ambulation making the rehabilitation results unsatisfactory. Although, the ultrasound-guided Adductor Canal Block (US-ACB) has the advantage of providing localized motor-sparing analgesia, it doesn’t provide pain relief to the posterior aspect of the knee. This pain could be decreased by addition of the ultrasound-guided local anesthetic infiltration of the interspace between the popliteal artery and the capsule of the posterior Knee (US-IPACK).

Methods: A 75-years-old patient, ASA 3, underwent TKA. Written informed consent was obtained. Previous sedation with Midazolam 0.02 mg/kg i.v., we performed US-IPACK by injecting 0.25% Levobupivacaine 20 ml. TKA was performed under spinal anaesthesia with 0.5% Levobupivacaine 12 ml. Tourniquet was used and released before closure. After surgery, a continuous US-ACB was performed by injecting 0.25% Levobupivacaine 20 ml plus 4 mg of Dexamethasone within the adductor canal, followed by catheter infusion at a rate of 8 ml/h of 0.2% Levobupivacaine, which was discontinued 72 hours postoperatively.

Results: Patient reported long-lasting pain relief allowing earlier and more effective rehabilitation. In the first 72 hours after surgery only 3 g of acetaminophen were administered, with rescue dose of ketorolac 30 mg as needed. No opioids were required.

Conclusions: Based on our results, we believe US-ACB/IPACK could provide good quality postoperative analgesia with reduced motor weakness, improving physical therapy performance and time to discharge with excellent patient satisfaction.

Postoperative Pain Management

ESRA7-0430

COMPARISON OF EPIDURAL ANALGESIA AND IV PCA WITH OPIOIDS IN TERMS OF POSTOPERATIVE PAIN AND THEIR COMPLICATIONS IN TOTAL KNEE REPLACEMENT ONCOSURGERY

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Background and Aims: Onco-surgical procedures on the lower limb like total knee replacement (TKR) with megaprosthesis, is associated with moderate (30%) to severe pain (60%). It hinders early intense physical therapy, the most influential factor for good postoperative knee rehabilitation. Also, resection of large part of bones along with soft tissues for these procedures may injure nerves and cause motor weakness.

Methods: In a retrospective study, data was collected from electronic records in patients who underwent TKR surgery and received epidural analgesia or IV PCA with opioids as analgesic modality. Total 68 Patients were divided accordingly into epidural group and IV PCA group. Average and maximum pain score in both the groups were compared on day 1 to day 3 and their complication including unilateral and bilateral motor weakness were noted.

Results: The average pain score on day 1 was significantly higher in IV PCA group (p<0.001) but on day 2 and day 3 there wasn’t any significant difference. The maximum pain score was higher in IV PCA group on day 1 and day 2 but no significant difference on day 3. A total of 21.9% had motor weakness in epidural group as compared to IV PCA group (zero incidence). However; 7.4% were occasionally drowsy in IV PCA group.

Conclusions: Both epidural with local anesthetics and IV PCA with opioids were effective in relieving post-operative pain but epidural local anaesthesia technique provided better pain relief than IV PCA with opioids following total knee arthroplasty in cancer surgery. Motor weakness was significantly more common in epidural group.

Postoperative Pain Management

ESRA7-0426

REDUCING POSTOPERATIVE OPIOID CONSUMPTION FOLLOWING LAPAROSCOPIC HEMICOLECTOMY DUE TO COLON CANCER USING THE ULTRASOUND-GUIDED TRANSMUSCULAR QUADRATUS LUMBOUM BLOCK - A RANDOMISED DOUBLE-BLIND CONTROLLED TRIAL

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Background and Aims: Three hundred and fifty patients/year undergo laparoscopic hemicolectomy at Zealand University Hospital due to colon cancer. 
Ultrasound-guided (USG) nerve blocks are currently not part of the postoperative analgesic regimen. Our on-going prospective observational study, so far including 31 patients, revealed that despite a multimodal analgesic regimen, patients still needed substantial amount of opioids; i.e. 43.2±31.1mg morphine (mean±SD) the first 24 hours postoperatively. It has been previously demonstrated that the USG Transversus Quadratus Lumbrorum (TQL) block spreads to the thoracic paravertebral space and therefore is able to alleviate both visceral and somatic pain. Aim: To significantly reduce the postoperative opioid consumption in patients undergoing laparoscopic hysterecomy by administering preoperative bilateral USG TQL block compared to placebo.

Methods: Following ethics committee approval a randomised controlled double-blind study will commence. Seventy-six patients undergoing laparoscopic hysterecomy due to colon cancer will be randomised to receive either an USG TQL block using ropivacaine 0.375% 30 ml bilaterally or isotonic saline. Primary outcome measure will be total opioid consumption during the first 24 hours following surgery. Secondary measures will be recorded pain scores (NRS 0–10), time to first opioid, time to first mobilisation and adverse events. We will be able to detect a 50% reduction in opioid consumption with α=5%, β=20% and a dropout rate of 15%.

Results: Further results from our prospective observational study, block technique and study design will be presented.

Conclusions: Our study will demonstrate whether it is possible to reduce postoperative opioid consumption following laparoscopic hysterecomy due to colon cancer by administering a bilateral USG TQL block.

Postoperative Pain Management

ESRA7-0435

DEMAND FOR REGIONAL ANAESTHESIA SERVICES FOR RIB FRACTURES AT A LONDON MAJOR TRAUMA CENTER – A RETROSPECTIVE AUDIT OF CURRENT OUTCOMES AND POTENTIAL CLINICAL NEED

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Background and Aims: Rib fractures are common in patients undergoing blunt trauma. Mortality is high and correlates directly with the number of ribs fractured, the presence of a flail segment or underlying lung injury, and age. Pain is significant and can be difficult to control. Effective, non-sedating, catheter based analgesic techniques such as thoracic epidurals or paravertebral blockade should represent an important cornerstone in the management of patients with multiple rib fractures. We looked at our institutional trauma database to determine potential demand and likely benefit for such a service at the Royal London Hospital.

Methods: We performed a retrospective interrogation of our main trauma database to find all patients admitted to the Royal London Hospital with three or more rib fractures between 1st Jan 2016 – 15th Jan 2017. The data was further analysed to examine other indications and contraindications to regional blockade.

Results: A total of 272 patients with ≥ 3 rib fractures were admitted to the Royal London Hospital in 2016, 72 Patients were older than 65. Mortality was 10.4% overall, 23% in the over 65 group, 5% in the under 65s.

Conclusions: Based on the above data we estimate that 10–15 patients a month would benefit from catheter based regional anaesthesia techniques at our institution. Potential benefits include reduced mortality, a reduced rate of respiratory complications and reduced length of ICU and hospital stay.

Postoperative Pain Management

ESRA7-0403

AUDIT ON POSTOPERATIVE PAIN MANAGEMENT AFTER ELECTIVE ABDOMINAL HYSTERECTOMY

Teodorescu D.M., and Malik A. Our Lady of Lourdes Hospital, Anaesthesia, Drogheda, Ireland.

Background and Aims: Abdominal hysterecomy is associated with significant postoperative pain. Different methods of analgesia are employed with various degrees of success.

Methods: We conducted an audit on postoperative analgesia after abdominal hysterectomy in Our Lady of Lourdes Hospital over a 6-month period. All patients (n=23) with elective abdominal hysterectomies and an uncomplicated postoperative course were included. ASA grade, methods of analgesia and analgesia, pain scores in post anaesthetic care unit (PACU), recovery time, type of analgesia used there, the maximal pain score during 3, 6, 12 hour intervals up to 48 hours after PACU discharge were recorded.

Results: All patients received general anaesthesia, 12 of them with a peripheral block and 11 patients with a neuraxial block (9 received spinal anaesthesia with intrathecal Morphine and 2 had epidural infusions). During PACU stay, the patients with intrathecal Morphine had lower pain scores than the ones without neuraxial blocks and significantly less recovery time. 10 patients without neuraxial blocks received patient controlled analgesia (PCA) with Morphine. Oral opiates were started after 24 hours postoperatively in the patients with intrathecal Morphine as per departmental protocol. For the first 18 hours after PACU discharge the patients with peripheral blocks PCA with Morphine had higher pain scores than the ones with intrathecal Morphine.

Conclusions: Intrathecal Morphine is more efficient than PCA in the first 18 hours after surgery, with less recovery time and more patient satisfaction. Combining intrathecal Morphine with oral opiates immediately postoperatively seem to be the optimal method of analgesia. An audit testing this assumption is ongoing.

Postoperative Pain Management

ESRA7-0271

FASCIA I LIACA COMPARTMENT BLOCK FOR HIP SURGERY: FROM PUBLISHED REVIVAL TO CLINICAL PRACTICE – RESULTS OF A BELGIAN SURVEY

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Background and Aims: Postoperative pain management after laparoscopic surgical procedures remains controversial. We compared two methods of analgesia within Enhanced Recovery After Surgery (ERAS)-program. The goal was to investigate whether spinal morphine would limit the need for systemic opioids and enhancing patient satisfaction as compared to intravenous opioids.

Methods: A single-center randomized double-blind controlled trial was performed after approval of an ethical committee (NL43488.101.13). Patients who were scheduled for laparoscopic colorectal resection were considered. Exclusion criteria were contra-indications for spinal anaesthesia, rectal and bariatric surgery and operations that were converted to open surgery. After informed consent patients were allocated to a spinal group (S) or a control group (C). S-group received single shot spinal bupivacaine/morphine (12.5 mg/300 mcg). C group received a placebo and intraoperative piritramide (0.1 mg/kg). Both groups received standardized general anesthesia and a PCA-pump. All patients were treated according to an ERAS-protocol.

Results: 56 patients were enrolled. There was a decrease in opioid-use and lower pain scores on the first postoperative day in the S-group (see figure 1 and table 1). Pruritus was the most predominate side-effect (41%). ERAS-adherence was equal in both groups, but patients in the S-group were fit-for-discharge earlier (3 (3–4) vs. 4 (3–5) days, p=0.044). A trend towards a higher patient satisfaction was observed.

Conclusions: This RCT shows that spinal morphine is an effective manner of postoperative analgesia in laparoscopic surgery. Recovery is faster and less painful in the S-group. A trend towards a higher level of patient satisfaction was detected.

Postoperative Pain Management

ESRA7-0055

SPINAL MORPHINE FOR LAPAROSCOPIC SEGMENTAL COLONIC RESECTION (SALMON-TRIAL): A RANDOMISED CONTROLLED TRIAL


Background and Aims: Post-operative pain management after laparoscopic segmental colorectal resections remains controversial. We compared two methods of analgesia within Enhanced Recovery After Surgery (ERAS)-program. The goal was to investigate whether spinal morphine would limit the need for systemic opioids and enhancing patient satisfaction as compared to intravenous opioids.

Methods: A single-center randomized double-blind controlled trial was performed after approval of an ethical committee (NL43488.101.13). Patients who were scheduled for laparoscopic colorectal resection were considered. Exclusion criteria were contra-indications for spinal anaesthesia, rectal and bariatric surgery and operations that were converted to open surgery. After informed consent patients were allocated to a spinal group (S) or a control group (C). S-group received single shot spinal bupivacaine/morphine (12.5 mg/300 mcg). C group received a placebo and intraoperative piritramide (0.1 mg/kg). Both groups received standardized general anesthesia and a PCA-pump. All patients were treated according to an ERAS-protocol.

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Postoperative Pain Management

ESRA7-0403

AUDIT ON POSTOPERATIVE PAIN MANAGEMENT AFTER ELECTIVE ABDOMINAL HYSTERECTOMY

Teodorescu D.M., and Malik A. Our Lady of Lourdes Hospital, Anaesthesia, Drogheda, Ireland.

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Results: All patients received general anaesthesia, 12 of them with a peripheral block and 11 patients with a neuraxial block (9 received spinal anaesthesia with intrathecal Morphine and 2 had epidural infusions). During PACU stay, the patients with intrathecal Morphine had lower pain scores than the ones without neuraxial blocks and significantly less recovery time. 10 patients without neuraxial blocks received patient controlled analgesia (PCA) with Morphine. Oral opiates were started after 24 hours postoperatively in the patients with intrathecal Morphine as per departmental protocol. For the first 18 hours after PACU discharge the patients with peripheral blocks PCA with Morphine had higher pain scores than the ones with intrathecal Morphine.

Conclusions: Intrathecal Morphine is more efficient than PCA in the first 18 hours after surgery, with less recovery time and more patient satisfaction. Combining intrathecal Morphine with oral opiates immediately postoperatively seem to be the optimal method of analgesia. An audit testing this assumption is ongoing.

Postoperative Pain Management
Background and Aims: Recent literature shows an increase in popularity of fascia iliaca compartment blocks (FICB) for postoperative pain management. This revival is probably due to the use of ultrasound guided (USG) techniques.

To link literature to daily practice, a survey was conducted to look at the usage of FICB and other types of postoperative pain management regimens in 2017 in Belgium.

Methods: The survey researchers questioned the preferential current and preferential past technique for hip surgery in a survey. The Belgian Association of Regional Anesthesia (BARA) distributed this survey by e-mail and we received 225 answers. This specific survey topic consisted out of 2 questions (fig 1).

Results: Numerous studies show a positive clinical impact of the FICB on patient outcome. Both USG “classic” transverse technique and longitudinal supra-inguinal USG technique have been described. However, no comparative studies are available.

USG FICB decreases opioid consumption in hip surgery patients. Less opioids are associated with a higher patient satisfaction and less side effects.

In contrast to literature, a Belgian survey shows a 66% relative increase in use of patient controlled intravenous analgesia (PCIA) (9.3 to 17.3%) and a 30% relative increase in use of FICB (12 to 15.6%). (fig 2)

Conclusions: Literature confirms an increase in popularity and effectiveness of the FICB, but more investigation is needed to find the optimal USG approach. Despite better outcome compared to opioids, a Belgian survey reveals a 30% increase in use of FICB compared to an 80% increase in use of PCIA.

Postoperative Pain Management

ESRA7-0383

POST LAPAROSCOPIC PAIN CONTROL USING LOCAL ANESTHESIA THROUGH LAPAROSCOPIC PORTS

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Background and Aims: Although patients do not experience severe pain after laparoscopic surgery, most of them experience acute or chronic pain afterward. While conventional pain killers including NSAID and narcotics in laparoscopic surgery have specific side effects, their application is inevitable. This study compares the efficacy of local anesthetic drugs and conventional pain killers in post-operative pain control.

Methods: This prospective clinical trial was conducted in two groups of patients (n=93). Group 1, as control group, was given conventional pain killers such as narcotics and NSAIDs. In another group as treatment group, at the end of laparoscopic surgeries, prior to port withdrawal, a local anesthetic mixture, a short acting (Lidocaine 2%) plus a long acting (Bupivacaine 0.5%) is instilled through the port lumen between the abdominal wall layers. The efficacy of both types of medications was compared with regards to their effectiveness and side effects.

Results: 85% of the control group, received 5 to 20 ml Morphine for pain control while the others were controlled with trans-rectal NSAIDs. In the treatment group, the pain of 65% of the patients was controlled only by local anesthetic drugs, 30% required NSAIDs and the other 5% required narcotics administration for pain control.

Conclusions: The administration of local anesthetic drugs after laparoscopic surgery is an effective method for pain control with a low complication rate and side effects of narcotics.

Postoperative Pain Management

ESRA7-0320

“A PAIN IN THE KNEE”: ANAESTHETIC TECHNIQUE FOR TOTAL KNEE REPLACEMENT AND ITS EFFECT ON POST-OPERATIVE ANALGESIA REQUIREMENTS AND PAIN SCORES

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Background and Aims: Post-operative pain in patients undergoing total knee replacement can be challenging to manage. To facilitate early mobilisation a combination of intrathecal opiate, lower limb blocks and local anaesthetic infiltration to the knee joint are often utilised. Alternatively, some anaesthetists advocate use of general anaesthetic techniques to improve mobilisation and pain control.

Our aim was to investigate the different anaesthetic strategies used intraoperatively, and assess how they impacted on post-operative pain scores and amount of breakthrough analgesia required.

Methods: Over a 2 month period, data was collected for patients undergoing elective total knee replacement, including anaesthetic technique and post-operative analgesic regimes. Patients were followed up for 3 days to obtain daily visual analogue scores (VAS) and breakthrough analgesia requirements.

Results: Data collected for 94 patients, mean age 68.3, mean BMI 30.79.

The groups using most breakthrough analgesia are group A and group E. These 2 groups also have most of the highest VAS scores on day 1.

The other groups receiving intrathecal opiate (groups B, C, D) have similar breakthrough analgesia usage regardless of the combination of nerve block and/or infiltration, and similar VAS scores throughout.

Conclusions: Although the number of patients in some of the groups were small, the results suggest that use of intrathecal opiate reduces breakthrough analgesia usage and improves VAS scores. In those patients who receive intrathecal opiate, use of local anaesthetic with nerve block and/or infiltration gives better results, but the exact combination of nerve block and/or infiltration seems to have little effect on VAS scores and breakthrough usage.
Postoperative Pain Management

ESRA7-0113

PARAVERTEBRAL BLOCK VS PECS BLOCK FOR PATIENTS UNDERGOING MASTECTOMY – ARE THEY EQUALLY EFFICACIOUS AND SAFE?

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Background and Aims: Para-vertebral blocks (PVB) provide effective analgesia for mastectomies but are technically challenging and involve significant risks. The newer, technically easier PEC’s block (PECS) appears to be as efficacious with a better risk profile. We aim to compare their efficacy and safety in our institution.

Methods: We retrospectively reviewed 65 adult female patients who underwent a mastectomy under GA with either PVB or PECS in the preceding 24 months. We compared patient characteristics, block-related difficulties and complications, pain scores, analgesic requirements, and opioid-related complications.

Results: 13 patients received PVB while 52 received PECS. There was no statistically significant difference in block-related difficulties or complications. Repeat attempts were required for 1 PVB but 0 PECS (p=0.20). Transient paraesthesia was encountered in 1 (7.7%) PVB and 2 (3.8%) PECS (p=0.49). There was no statistically significant difference in incidence of side effects: nausea (PVB 0%, PECS 19.6%, p=0.11), sedation (PVB 7.7%, PECS 5.8%, p=1.00), post-operative oxygen supplementation (PVB 7.7%, PECS 9.6%, p=1.00). Pain scores were not significantly different upon awakening (PVB 1.2±2.5, PECS 0.7±1.3, p=0.34), at 30 min (PVB 0.5±1.0, PECS 0.7±1.0, p=0.54) and 24 hours (PVB 0.2±0.4, PECS 0.3±0.7, p=0.40). Opioid usage (IV morphine equivalent) was not significantly different intra-operatively (PVB 3.0±2.5mg, PECS 1.8±2.6mg, p=0.15), in PACU (PVB 0.4±0.9, PECS 0.3±0.7, p=0.49) and 24 hours (PVB 0.3±0.2, PECS 0.3±0.4, p=0.98).

Conclusions: Complication rates, pain scores, opioid usage and side effects were low for both groups. Post-mastectomy analgesia efficacy and safety profile with PECS or PVB are not statistically different.

Postoperative Pain Management

ESRA7-0068

HOW REGIONAL ANAESTHETIC TECHNIQUES INFLUENCE PSYCHOLOGICAL STATE OF PATIENTS AFTER TOTAL HIP AND KNEE ARTHROPLASTY?

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Background and Aims: Chronic pain in orthopaedic patients is one of the main reasons of anxiety and depression which influences postoperative analgesia, length of stay and rehabilitation. Regional practices block nociceptive impulses and can improve patients’ psychological condition. The aim of this study was to evaluate the effect of different regional practices on the psychological state of patients undergoing total hip and knee arthroplasty.

Methods: One hundred patients were included into prospective randomized study which has been approved by the local ethics. First group (35 patients) were under general anaesthesia with continuous peripheral nerve block: femoral or fascia iliaca compartment block (GA-cPNB). Second group (35 patients) received spinal anaesthesia combined with prolonged epidural analgesia (CSEA), and spinal anaesthesia added with single peripheral nerve block (SA-sPNB) was performed in third group (30 patients). Hospital anxiety and depression scale (HADS) was calculated preoperatively and on seventh postoperatively day. Failed questionnaires were found less than six percentage respondents. ANOVA, χ2 and Student’s t-test were used.

Results: 41 of 96 patients (43%) had borderline or abnormal preoperative anxiety (95% CI 0.32-0.54) and 28 of 98 (29%) had depression (95% CI 0.2-0.39). There was no difference between groups who appeared preoperative anxiety and depression (p=0.138 and p=0.379). In CSEA group postoperative anxiety and depression level decreased better than in GA-cPNB group (p=0.012 and p=0.033 versus p <0.001 and p=0.164 respectively). Contrariwise, it was insignificant with those received SA-sPNB (p=0.338 and p=0.632 respectively).

Conclusions: Prolonged regional analgesia improves psycho-emotional condition comparing with single practices.
We used QL block to treat severe, intractable pain and side effects. To date, few complications of the QL block are reported but they cannot be excluded. It is possible that mechanical ventilation pushed the kidney (fig.2) toward the needle, providing the injury. 

Conclusions: This complication occurred after QL1 and trocar insertion. Both could have triggered the hemorrhage, but neither can be excluded. We suggest extreme caution in performing a right QLB1 (lateral QLB) in mechanically ventilated thin patients.
Case Reports

ESRA7-0536

OPIOID FREE ANAESTHESIA FOR MAJOR ABDOMINAL SURGERY - IS BILATERAL QUADRATUS LUMBORUM THE ANSWER? CASE REPORT

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Background and Aims: Opioids are the necessary evil of anaesthesia. They interfere with enhanced recovery after surgery, induce respiratory depression, nausea, hyperalgesia and chronic pain, and may have a role in cancer recurrence. Regardless the advances in anaesthesia, opioids are still being used.

We tested if performing bilateral quadratus lumborum block (QL) for major abdominal surgery can prevent opioid use. We present the case of a patient with open surgical lysis of adhesions.

Methods: A 59 years old female patient presented with occlusive syndrome. Adhesions were suspected and laparotomy was indicated. Patient was known to have opioid induced nausea. She refused epidural anaesthesia, but agreed to bilateral QL with catheters. General anaesthesia was induced without opioids. Bilateral QL was performed with 30 ml ropivacaine 0.25% on each side and catheters were placed. The surgeon was instructed to make the incision carefully, baring to prepare to stop to allow us intravenous drugs administration if needed.

Results: Major abdominal surgery lasting 4.5 hours was performed uneventfully without opioid administration. During skin suture the patient developed clinical signs of pain. Intravenous analgesia was administered and infusion with ropivacaine 0.1%, 5 ml per hour on each side was started. Until the next day, when one of the catheters was accidentally removed, opioids were not needed.

Conclusions: We believe that bilateral QL block might be a valid solution to perform opioid free anaesthesia even for major abdominal surgery. Studies are needed to establish the optimal use.

Case Reports

ESRA7-0554

THE EFFECT OF ULTRASOUND GUIDED BILATERAL SUBPECTORAL INTERFACIAL PLANE BLOCK FOR MANAGEMENT OF STERNAL FRACTURE PAIN


Background and Aims: Sternal fractures may occur after cardiopulmonary resuscitation and if not treated, it may cause severe pain inducing pulmonary morbidities. Major component of the treatment is pain control. In this case we presented the efficacy and therapeutic effect of bilateral subpectoral interfacial plane block performed under ultrasonography for management of sternal fracture pain.

Methods: A 64 year old male patient was being treated for chronic renal failure (CRF). With the diagnosis of myocardial ischemia coronary angiography was performed. Cardiac arrest occurred and he was resuscitated for 20 minutes. After 24 hours, in the intensive care the patient had severe pain on the anterior chest wall and he had hyperventilation. Despite the support of analgesia and non-invasive mechanical ventilation, hypoxic respiratory failure due to sternal fracture was diagnosed. Chest tomography revealed atelectasis in the anterior parts of both lungs. Mixed acidosis that had metabolic pattern due to CRF was determined by blood gas analysis.

Results: Because of severe pain during respiration and coughing, we applied bilateral subpectoral interfascial plan block under ultrasound guidance. 20 ml of bupivacaine 0.25% was applied and effective analgesia was provided. The patient did not need any additional analgesic drug and non-invasive mechanical ventilation. There were no side effects. The patient was discharged to cardiology after 24 hours.

Conclusions: Especially thoracic pain can disrupt patients' respiratory pattern and cause morbidity even mortality. The appropriate and right time analgesia can reduce the need for mechanical ventilation and the period in intensive care. Bilateral subpectoral interfascial plan block under ultrasound guidance can be considered as an alternative because it is easier and more effective.

Case Reports

ESRA7-0552

ANESTHESIA MANAGEMENT OF A PATIENT WITH AMYOTROPHIC LATERAL SCLEROSIS AND WOLFF-PARKINSON WHITE SYNDROMES: A CASE REPORT


Background and Aims: Amyotrophic Lateral Sclerosis (ALS) is a progressive disease with motor neuron degeneration in the cerebral cortex, brain stem and spinal cord and respiratory involvement is one of the major causes of death. Wolff-Parkinson-White (WPW) syndrome is a ventricular pre-excitation syndrome which may be life threatening ventricular fibrillation. Anaesthesia management of a patient with ALS and WPW syndromes was reported.

Methods: A 59-year-old, 97 kg,180 cm male patient with 3-years history of ALS, osteoporootic vertebral fractures, moderate aortic stenosis and mitral regurgitation, secondary to previous lobectomy complicated by bronchiectasis; ischaemic heart disease; moderate aortic stenosis and mitral regurgitation.

Results: Bilateral iliouinguinal-iliohypogastric nerve blocks were performed before general anaesthesia induction with 20ml 0.5% ropivacaine under ultrasound guidance. Desflurane and target-controlled remifentanil infusion was used intraoperatively for the 3h procedure.

Conclusions: Immediately post-procedure, the patient was oriented, awake and pain-free but found to have asymptomatic respiratory acidosis (pCO2 109.9). A trial of non-invasive ventilation (NIV) normalized his PaCO2 but it reverted to its previous levels rapidly after cessation of NIV. The diagnosis was acute-on-chronic carbon dioxide retention secondary to blunting of hypoxic respiratory drive, on which he was dependent, due to supplemental oxygen administration. He subsequently made an uneventful recovery.

Conclusions: The use of peripheral nerve blocks for analgesia allowed us to minimize opioid use. In a patient at high risk of respiratory decompensation following major surgery, regional anaesthesia allowed us to completely avoid residual opioid side effects. In this patient, opioids could worsen the postoperative decompensation that the patient developed and also potentially confound the diagnosis, delaying the reversal of his acidosis with further undesired
consequences on his already impaired myocardial function. This case illustrates the value of regional anaesthesia in patient management.

Case Reports

ESRA7-0524

GREATER OCCIPITAL NERVE BLOCK MAY AFFECT THE EFFECTIVENESS OF TRIPTAN OVERUSE HEADACHE TREATMENT

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Background and Aims: A 59 yo female patient suffering from migraine headaches since she turned 21. For many years, these headaches were paroxysmal in nature, without aura. Since the age of 45 (during menopause), migraine headaches became chronic in nature. For approximately 10 years, she has been taking sumatriptan, 100 mg po 1-2 times daily, obtaining effective short time pain relief (for a few hours).

Methods: During the first intervention, gnb was performed at the medial third of the line between the external occipital protuberance and the mastoid process. 3 ml of 2% lidocaine was administered bilaterally by subcutaneous injection. The second bilateral gnb block was performed under ultrasound guidance at the level of c2. 4 ml of 2% lidocaine was administered bilaterally.

Results: After the first greater occipital nerve block, a favourable analgesic effect was obtained for 14 days. The patient in this period did not take triptans, headaches occurred occasionally, responding well to paracetamol or ibuprofen. After this 14 days period patient returned to triptans treatment. Due to a short-term effect, a second block was performed which proved to be more effective. For approximately 3 months, the patient has not been taking triptans, the number of days with headaches and the intensity of headaches have substantially decreased.

Conclusions: Over the last few years, greater occipital nerve block has become an effective method in the treatment of migraine headaches, also those caused by the overuse of triptans. To achieve a satisfactory effect, it is worth using different techniques of greater occipital nerve block.

Case Reports

ESRA7-0508

APPLICATION OF PRE-EMPTIVE ANALGESIA STRATEGY FOR OPERATIVE PROCEDURES

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Background and Aims: Pain from surgical procedures occurs as a consequence of tissue trauma and may result in physical, cognitive, and emotional discomfort. Pre-emptive analgesia focuses on postoperative pain control and the prevention of central sensitization and chronic neuropathic pain by providing analgesia administered preoperatively but not after surgical incision.

Methods: In a randomized double blind study, 40 patients were given Lyrica 75 mg 2hr preop +/- Celebrex 200mg PO CAP. 2hr preop. +/- zantac 150mg PO tab. 2hr preoperative then postoperative; Lyrica 75 mg at night HS + Celebrex 200mg PO CAP. BD +/- Solpadine 2tab. QID post. Op

Combined with regional anaesthesia (spinal/epidural), intraoperative local anaesthetic infiltration and some slow release post operative analgesia, my experience is that patients are more comfortable post op, able to mobilise much quicker and achieve an earlier and more comfortable discharge from hospital.

Results: Time for rescue analgesia (VAS score >3) was significantly increased in most patients given Lyrica preoperative and postoperative with NSAIDs. The sedation scores and patient satisfaction scores were also more with Lyrica, NSAIDs. single dose preoperative pregabalin improves analgesia in early postoperative period and reduces diclofenac requirement post-operatively which was significantly lower as compared to placebo group. single dose preoperative pregabalin improves analgesia in early postoperative period and reduces
Central Nerve Blocks

ESRA7-0532

COMBINED SPINAL-EPIDURAL ANAESTHESIA AS A COMPONENT OF MULTIMODAL APPROACH VERSUS GENERAL ANAESTHESIA FOR MAJOR UROLOGICAL SURGERY

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Background and Aims: To compare the haemodynamic effects, the amount of hypnotic and opioid consumed in standard general anesthesia (GA) and combined spinal-epidural anaesthesia as part of the multimodal analgesia/analgésia (MMA) for patients undergoing major urological surgery in pelvis region.

Methods: A prospective study was conducted on 58 patients undergoing radical prostatectomy or cystectomy between January 2014 and December 2015. A three-component (hypnotic, anaesthetic, relaxant) general anaesthesia was used in a group of 24 patients and a second group of 34 patients which received combined spinal epidural anaesthesia as an element of the multimodal approach. Depth of anaesthesia was controlled by BIS monitoring.

The demographic data of patients, systolic, diastolic and mean arterial pressure, heart rate, hypotonic and opiate consumption in both groups were studied. Statistical analysis of distributions, verification of hypotheses by t-criterion of Student, statistical dispersion and descriptive analysis of time series were used.

Results: We found a difference in the mean dose of Propofol for induction in MMA and GA. For MMA significantly lower amount of fentanyl was used intraoperatively. Arterial pressure showed a stable character, with the MMA group statistically significantly lower. Heart rate in the MMA group is less variable.

Conclusions: MMA ensures better intraoperative analgesia according to our investigations on haemodynamic parameters. The use of opioid analgesics is significantly reduced using the multimodal anaesthesia technique. Perioperative regional anaesthesia/analgésia as part of multimodal drug therapy may prove to be the most effective approach in major urological surgery for elderly, cognitively impaired patients with many comorbid diseases.

Central Nerve Blocks

ESRA7-0558

TRANSIENT DEAFNESS FOLLOWING ACCIDENTAL DURAL PUNCTURE AFTER EPIDURAL – A CASE REPORT

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Background and Aims: Transient hearing loss after dural puncture have been reported. But the exact etiology and incidence are not well described. Here we present a case of transient hearing loss following an accidental dural puncture.

Methods: Case Report

66 yr old woman underwent laparotomy. The epidural was performed with 16’ gauge Touhy needle. First attempt resulted in accidental dural puncture at the level of T9/T10 but was successful at T8/9 level. The block level achieved was between T4 and L1. On the 1st post operative day when sat up she complained of severe headache followed by bilateral deafness. The headache was less when she was supine. PDPH was diagnosed. Epidural was stopped. Otoscopy was normal. Rinnie and Weber tests were performed. Those tests could not identify the type of deafness because of bilateral nature of deafness. After 24hrs the symptoms resolved almost completely and audiogram was not done.

Results: Studies support the hypothesis that symptoms result from leakage of CSF, changing the pressure of peri lymph in the inner ear. The size of needle and its design can play a role in preventing the symptoms smaller gauge needles and those which employ a pencil point design are associated with decreased incidence of PDPH and hearing loss. This can explain symptoms in our patient as she had dural puncture with 16 gauge needle.

Conclusions: Hearing loss after dural puncture is more frequent than anaesthetists appreciate. We would like to discuss if we need to make patients aware of hearing loss as a side effect of spinal anaesthesia.

Central Nerve Blocks

ESRA7-0512

THE INFLUENCE OF SHAPE OF DIFFERENT SPINAL NEEDLES ON DURAL PUNCTURE: A STUDY WITH PORCINE LUMBAR DURA

Utsumi I., Omi S., and Hasclowicz T. The Jikei University School of Medicine-Daitoan Hospital, anaesthesiology, Tokyo, Japan.

Background and Aims: Spinal anaesthesia is a blind procedure and it differs from epidural anaesthesia where “loss of resistance” or “hanging drop” techniques are widely applied. We thought that a specific “pop” sensation felt by anaesthesiologists on penetration of the dura and arachnoid may facilitate proper needle placement. The purpose of the present study was to evaluate differences between various spinal anaesthesia needles in regard to characteristics and effects on lumbar dural puncture.

Methods: Porcine dura mater was used. Spinal anaesthesia needles used for comparisons were 25G and 27G cutting and non-cutting needles from 7 different manufacturers. The dura deformation curves obtained by recording dynamic changes of forces required to penetrate the dura (100 punctures/one kind of needle) were analyzed (Fig1) (Fig2).

Results: The L4-L5 interspace was correctly identified in five out of 20 patients (25%) with Touffer’s line and 14 out of 20 patients (70%) with the tenth rib line (P=0.01).

FIGURE 1. Pencil Point Needle.
A 56-year-old man had psoriasis for 20 years and he had a history of lumbar back surgery complicated by foot drop when he presented in pain clinic with mechanical low back pain, an upward going right plantar and left meralgia paraesthetica. Later on he developed lower limb weakness. The MRI scan showed demyelination plaques. The medications that he took for pain control are as follows: paracetamol, pregabalin, low dose morphine and ibuprofen. He also had facet joint injections, physiotherapy and pain management plan.

Conclusions: The importance of pain in multiple sclerosis has been underestimated for a long time. Now, it is well recognised that pain has a major influence on the quality of life in nearly half of MS patients and one-third believe that pain is their main problem. Even though damaged demyelinated areas in the brain can be seen in the MRI scan, and symptoms are widely described in the literature, the diagnosis of MS is still challenging most of the time due to its complex clinical presentation.

### Chronic Pain Management

**ESRA7-0564**

**DEVELOPMENT OF MULTIPLE SCLEROSIS ALONGSIDE PREVIOUS PSORIASIS AND MECHANICAL LOW BACK PAIN**

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**Background and Aims:** The aim of this case report is to highlight the importance of pain as a symptom and as a quality factor for patients with multiple sclerosis (MS). The pain in MS has many challenges when diagnosing as clinical pain presentation is usually complex and to manage the pain effectively is hard to achieve.

**Methods:** We wrote this case report retrospectively—taking medical history of the patient, using medical records (medical specialist’s consultation letters, MRI scans and other investigations results).

**Results:** A 56-year-old man had psoriasis for 20 years and he had a history of lumbar back surgery complicated by foot drop when he presented in pain clinic with mechanical low back pain, an upward going right plantar and left meralgia paraesthetica. Later on he developed lower limb weakness. The MRI scan showed demyelination plaques. The medications that he took for pain control are as follows: paracetamol, pregabalin, low dose morphine and ibuprofen. He also had facet joint injections, physiotherapy and pain management plan.

**Conclusions:** The importance of pain in multiple sclerosis has been underestimated for a long time. Now, it is well recognised that pain has a major influence on the quality of life in nearly half of MS patients and one-third believe that pain is their main problem. Even though damaged demyelinated areas in the brain can be seen in the MRI scan, and symptoms are widely described in the literature, the diagnosis of MS is still challenging most of the time due to its complex clinical presentation.
Chronic Pain Management

ESRA7-0561

STROKE-LIKE MIGRAINE ATTACKS AFTER GAMMA KNIFE RADIOSURGERY: A CASE REPORT

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Background and Aims: International literature shows a few reports for post gamma knife induced headache. Scientific disagreement on diagnostic criteria of this syndrome exists and no specific treatment is approved.

Methods: A fifty-eight-years-old woman referred from Stroke-Like migraine attacks after Gamma knife radiosurgery for prolactinoma performed five years ago. The patient in the past received combination of drugs for migraine management topiramate, venlafaxine, duloxetine, mirtazapine, steroids and NSAID and increasing high doses of paracetamol (5g/day) and codeine (100mg/day) for the past three years. She also noticed the use of sc octreotide reduced the migraines.

Results: The migraine disappeared after 20 days with a dose of 2x25mg of amitriptyline. Keeping in mind the possibility that the migraine could be triggered from codeine or octreotide, we tried to withdraw amitriptyline as well after 40 days of administration to the dose of 25mg, but the migraine reappeared.

Conclusions: The result suggests that sleep disturbance is common complaint in patients with CLBP at chronic pain clinic. Addressing sleep disturbance issue during their consultation might help to understand and treat chronic pain better.

Chronic Pain Management

ESRA7-0563

ROLE OF DRG PRF IN TREATMENT OF POST HERPETIC ITCH: CASE REPORT

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Background and Aims: Postherpetic itch (PHI) is one of the presenting symptom but not common after herpes zoster infection. Mechanism of postherpetic itch is not understood well till now. Various treatment tried in the past with some success, pulsed radio frequency ablation is one of them.

Methods: A 41 year old woman referred to pain clinic for pain and itch in the lower thoracic and upper lumbar area following a shingles infection. She tried Lyrica and Amitriptyline in past with no benefit. On examination she had hypoesthesia at L2-L3 levels. There was no allodynia but on touch provoke itch.

Results: Initial L1 SNRB (Local anaesthetics) had given relieve for a week. Subsequently L1 DRG PRF was effective in post herpetic itch. Further studies should be taken to know its benefits in PHI.

Conclusions: The result suggests that sleep disturbance is common complaint in patients with CLBP at chronic pain clinic. Addressing sleep disturbance issue during their consultation might help to understand and treat chronic pain better.

Chronic Pain Management

ESRA7-0520

SLEEP DISTURBANCE IN CHRONIC LOWER BACK PAIN PATIENTS AT MULTIDISCIPLINARY PAIN CLINIC


Background and Aims: Sleep disturbance is a common complain which is generally observed in patients with Chronic Lower Back Pain (CLBP). It is often associated with pain, fatigue and psychological issue (viz. depression, mood disorder etc).

There are several studies which reveals that in CLBP patient, management of sleep disturbance might be beneficial. NICE guideline 2006 advice people with CLBP should try to be more physically active which will help in improving their medical condition.

Methods: 44 outpatients with CLBP who came for consultation at the pain clinic were enquired about their sleep pattern. They were asked to rate their sleep experience as: very poor, poor, good and very good. Pain assessment was recorded at same time by Numeric Rating Scale (NRS) along with their physical activity and exercise at a pain clinic.

Results: 61% of patients who attended the chronic pain clinic had reported sleep disturbance with higher pain score and minimal physical activity & exercise.

Conclusions: The result suggests that sleep disturbance is common complaint in patients with CLBP at chronic pain clinic. Addressing sleep disturbance issue during their consultation might help to understand and treat chronic pain better.
FREE PAPER SESSION 5: POSTOPERATIVE PAIN MANAGEMENT

ESRA7-0555

COMPARISON OF IV PATIENT CONTROLLED ANALGESIA AND EPIDURAL CATHETER FOR POSTOPERATIVE ANALGESIA IN POSTERIOR INSTRUMENTATION PATIENTS

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Background and Aims: We aimed to compare the postoperative analgesia effect of patient-controlled analgesia (PCA) and epidural catheter in patients with posterior instrumentation and determine more effective technique.

Methods: Sixty ASA 1-2 cases scheduled for elective thoracic/lumbar posterior instrumentation were divided into two groups according to their choices (Group 1: IV PCA, and Group 2 epidural PCA). In the postoperative recovery room Group1 (n=30) patients received a fluid containing 10 μg/mL fentanyl. Group2 (n=30) patients were applied bupivacaine 0.1% and 2 μg/mL fentanyl. Postoperatively patients were evaluated in terms of pain according to VAS scale, patient satisfactions, motor blocks at the 1., 2., 4., 6., 16., 20., 24., 30., 36., 42. and 48 hours. The side effects, total amount of the rescue analgesia, needs of opioids and local analgetics of patients were recorded.

Results: Demographic data was similar. VAS scores for Group 2 at the 1., 2., 4., 8. and 16. hours were significantly lower than Group 1 (p<0.01). Postoperative patient satisfaction scores at all times were statistically significant between the groups (p(0.05) on behalf of Group 2. There was no statistically significant correlation between the hemodynamic parameters and VAS scores. Group 1 required statistically significantly higher amount of rescue analgesia.

Conclusions: In the early postoperative period VAS scores of patients with epidural PCA were significantly lower than those of the patients with IV PCA. Similarly, patient satisfaction of epidural PCA group at all recorded times was higher than those of the IV PCA. For these reasons, we believe that epidural PCA is one of the preferable and safe methods with its high efficacy and a low rate of side effects.

ESRA7-0542

EFFECT OF DIFFERENT COMBINATION DOSES OF INTRATEHICAL HYPERBARIC BUPIVACAINE 0.5% AND SUFENTANIL ON THE HEMODYNAMIC PROFILE OF GERIATRIC PATIENTS UNDERGOING HIP SURGERY UNDER SPINAL ANESTHESIA

Vosoughian M., Shahid Beheshti University of Medical Sciences, Anesthesiology and Critical Care, Tehran, Iran.

Background and Aims: With the increasing number of elderly patients with fragile hemodynamic profiles undergoing lower limb surgery, avoiding hypotension in this population is of great importance. We intended to study the effect of different combination doses of intrathecal hyperbaric bupivacaine 0.5% and sufentanil on the hemodynamic profile of geriatric patients undergoing lower limb surgery.

Methods: 60 elderly patients were randomly allocated into three groups. Group 1 (G1: 5 mg bupivacaine plus 10 μg sufentanil intrathecally), Group 2 (G2: 10 mg bupivacaine plus 5 μg sufentanil intrathecally), and Group 3 (G3: 15 mg bupivacaine intrathecally). Non-invasive automated blood pressure was checked every 1 minute for the first 5 minutes, and every 5 minutes for 25 minutes and every 15 minutes for 30 minutes during surgery. Heart rate (HR) was recorded at the same intervals.

Results: A total of 60 patients met the inclusion criteria and were enrolled in the study. Five patients had failed spinal anesthesia whom were replaced with new patients. Mean arterial pressure after 1 minute in Groups 2 and 3 was significantly lower than Group 1 (86.0 ± 9.0, 87.3 ± 11.0, 92.2 ± 13.0, P = 0.001). No statistically significant difference in HR was observed in between the three groups. The degree of motor and sensory block was adequate in all three groups, and no patients required any additional analgesics.

Conclusions: Adding sufentanil as an adjuvant and decreasing the dose of intrathecal hyperbaric bupivacaine may help maintain a stable hemodynamic during lower limb surgery in the elderly.
CASE PRESENTATION: INDIVIDUALISED DECISION-MAKING BASED ON THROMBOELASTOGRAPHY IN A PATIENT WITH INHERITED HYPOFIBRINOGENAEMIA

Eden-Green B.1, and Fleming I.2
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Background and Aims: Inherited hypofibrinogenemia is a very rare disorder, with a prevalence of 0.5-3 per million. Regional anaesthesia is considered to be contraindicated due to the increased risk of epidural hematoma. This case demonstrates how point of care coagulation testing was used to challenge this orthodoxy. It is also the first case reported on the use of epidural analgesia in a patient with hypofibrinogenemia.

Methods: A 41 year old primiparous woman presented to the delivery suite for induction of labour (indication post-dates). She had a diagnosis of inherited hypofibrinogenemia (clauss fibrinogen 0.4g/L pre-pregnancy). She had been reviewed 1 month earlier in the anaesthetic pre-assessment clinic and following discussion with her haematology team it was agreed that regional anaesthesia was contraindicated.

After a long first stage of labour, where opioid analgesia was insufficient, she requested a caesarean section on the grounds of uncontrolled pain. Thromboelastography (TEG) was performed (see Figures 1 and 2). These results were discussed with Haematology and the patient and it was agreed that epidural analgesia could be safely offered. She proceeded to have a normal vaginal delivery under epidural analgesia.

Results: See Figures 1 and 2.

Conclusions: Through use of point of care coagulation testing, the anaesthetic team was able to demonstrate to themselves, Haematology and the patient, that the patient’s clotting was adequate. Thromboelastography thus enabled a rapid response to the clinical situation, a change to the original anaesthetic plan, and a normal delivery.

CONSENT FOR OBSTETRIC NEURAXIAL BLOCKADE - WHAT DO WE DOCUMENT?

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Background and Aims: Informed consent for Central neuraxial blockade (CNB) in labour is a potential source of litigation for anaesthetists. Wide variations exist regarding the information given to parturients about CNB, and a consensus of documentation of consent does not exist. We aimed to examine our consent process for obstetric neuraxial blockade, including the specific risks and probabilities discussed.

Methods: Three month audit (March - May 2017) in a district general hospital with 3000 deliveries/year. Patients were included if they had undergone CNB (epidural/spinal/CSE) for labour analgesia or facilitation of obstetric procedures. Data was extracted from the anaesthetic record and electronic notes (Badgermet).

Results: 238 parturients underwent CNB between March-May 2017. 46% of cases took place during normal working hours, with the rest (54%) occurring out of hours. 174 cases (73%) had documentation of consent for CNB. Only 5 patients (2%) had been offered written information. The percentage of parturients without documentation of the consent process were similar both in and out of hours (21 vs 22%).

CTs most often documented consent (100% of cases performed by grade), followed by SpRs (83%), locum doctors (76%), consultants (60%) and SAS doctors (37.5%).

The risks documented and probabilities quoted to parturients can be seen in table1.

Conclusions: We have demonstrated that even within a single obstetric unit, considerable variation exists in the standard and quality of information given to women regarding CNB. The widespread use of standardised consent forms that serve as a reminder of the risks, and as a record of the discussion may improve documentation of the consent process.

TABLE 1.

<table>
<thead>
<tr>
<th>Risk</th>
<th>Undergoing spinal (n=174)</th>
<th>Range quoted</th>
<th>Undergoing epidural (n=132)</th>
<th>Range quoted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypotension</td>
<td>0.0 - 1.00</td>
<td>1.00</td>
<td>0.00 - 1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Failure</td>
<td>0.0 - 1.00</td>
<td>1.00</td>
<td>0.00 - 1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>FDP</td>
<td>0.0 - 1.00</td>
<td>1.00</td>
<td>0.00 - 1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Spinal nerve - temporary</td>
<td>0.0 - 1.00</td>
<td>1.00</td>
<td>0.00 - 1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Spinal nerve - permanent</td>
<td>0.0 - 1.00</td>
<td>1.00</td>
<td>0.00 - 1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>CNS infection - abscess/meningitis</td>
<td>0.0 - 1.00</td>
<td>1.00</td>
<td>0.00 - 1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Haematoma</td>
<td>0.0 - 1.00</td>
<td>1.00</td>
<td>0.00 - 1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Pandex</td>
<td>0.0 - 1.00</td>
<td>1.00</td>
<td>0.00 - 1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Instrumental delivery</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
</tbody>
</table>

Table 1 - Risks quoted to parturients during consent for CNB

Conclusions: Through use of point of care coagulation testing, the anaesthetic team was able to demonstrate to themselves, Haematology and the patient, that the patient’s clotting was adequate. Thromboelastography thus enabled a rapid response to the clinical situation, a change to the original anaesthetic plan, and a normal delivery.
**Obstetric**

**ESRA7-0560**

**POST-DURAL PUNCTURE HEADACHE - A DISTRICT HOSPITAL EXPERIENCE**

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Background and Aims: Accidental dural puncture is a possible complication of loco-regional anesthesia (LRA) that can result in post-dural puncture headache (PDPH) in 80-86% of obstetric patients, which is associated with high morbidity. This study aimed to determine the incidence, characterization and management of PDPH in a Portuguese district hospital.

Methods: Retrospective study including 2221 pregnant women submitted to LRA between January 2016 and March 2017. Data about LRA technique and procedure, PDPH characteristics and prescribed treatment were collected.

Results: Total of 2221 women, mean age 29 ± 6 years, classified as ASA II, submitted to LRA for labor analgesia (65.2%) or cesarean section (34.8%). 1443 epidural and 503 combined spinal-epidural and 275 subarachnoid blocks were performed. The incidence of accidental PDPH was 1.4% (n = 20). 8 after accidental puncture with Tuohy needle and 1 case with epidural catheter. Regarding the characterization of PDPH, it presented frontal (n = 9), occipital (n = 7) or fronto-occipital (n = 4) location, aggravating with orthostatism and being continuous in 89.5% and 23.7% of cases, respectively. Associated symptoms were present in 65.8%; cervicalgia, dizziness, nausea and vomiting were the most frequent. Despite lack of evidence of its efficacy, conservative treatment was used in all patients, and 2 epidural blood patches were performed after treatment failure. At discharge, 62.5% of the patients had no complaints.

Conclusions: The incidence of accidental puncture and PDPH was similar to that of the literature. Despite being a common complication, there is a lack of consensus in its approach.

**Conclusions:** The US-DPNB did not provide better postoperative analgesia compared to the landmark DPNB after circumcision in children.

**Pediatric**

**ESRA7-0538**

**BILATERAL QLB IN EMERGENCY PEDIATRIC LAPAROSCOPIC SURGERY**

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Background and Aims: Our team was interested of the efficacy of the transmuscular QLB in emergency laparoscopic pediatric surgery for perioperative analgesia. The rationale for our research is that Borgan and Bendsen nicely demonstrated the extensive spread of local anesthetic in the narrow interfascial plane (between PM and QL) form L1 up to T4 and towards the paravertebral spaces which could explain the observed somatic and visceral analgesia and lower pain scores in comparison with the TAP block.

Methods: We enrolled a cohort of 8 cases of emergency laparoscopic pediatric surgery (diffuse peritonitis and typical acute appendicitis) operated on under GA. GA was induced with 0.5 mcg/kg Sufentanil, Propofol, rocuronium and was maintained with sevofoamine 1 - 1.5 MAC. The bilateral QLB was performed after the induction with 10 - 15 ml ropivacaine 0.375 % on each side. The maximal allowable dose of 3 mg/kg was respected.

All children received Paracetamol 15 mg/kg at the end of surgery. NSAIDs were not administered.

Results: No need to add more opiates after the induction dose during the surgery.

- 3 childrens - no pain in PACU
- 4 children needed one administration of Nalbuphine 0.2 mg/kg in PACU
- Just one child needed two applications of Nalbuphine 0.2 mg/kg postoperatively
- The next 24 hours the patients needed just paracetamol 15 mg/kg four times a day.
- No incisions site infiltration of LA, no other opiates.
- No side effects were observed.

Conclusions: The bilateral QLB markedly decreased opiate needs intra- and postoperatively. It certainly has place in the intra and postoperative multimodal analgesia in pediatric emergency laparoscopic surgery.

**Pediatric**

**ESRA7-0550**

**DORSILE PENILE NERVE BLOCK FOR CIRCUMCISION: A COMPARISON OF ULTRASOUND-GUIDED VS. LANDMARK TECHNIQUE**


Background and Aims: Circumcision is a widespread surgical procedure in children for which dorsal penile nerve block (DPNB) is performed to reduce postoperative pain. With the traditional landmark technique (LM-DPNB) a failure rate of 4-7% is described.

We performed a prospective randomized comparison of the LM-DPNB and the ultrasound-guided technique (US-DPNB) and hypothesized the latter provides better postoperative analgesia.

Methods: Following ethical committee approval and written parental informed consent, 310 patients, between 3 months and 12 years old, were included in this prospective, double-blind trial and randomly assigned to one of the two groups. A dose of 0.2mL/kg levobupivacaine 0.5% was used.

Primary end points were the frequency and dose of postoperatively administered piritramide. Secondary outcomes were anesthesia induction times, postoperative pain scores, discharge times and need for analgesics at home. Groups were compared using the Fisher's Exact test for proportions and the Mann-Whitney-U-test for continuous variables. A p <0.05 was considered statistically significant, and a Bonferroni correction was applied for multiple testing.

Results: The proportion of patients that needed piritramide (LM: 38% vs. US: 46%; p=0.135), neither the dose (median dose LM: 0.6mg vs. US: 0.5 mg; p=0.267) differed significantly between both groups.

Anesthesia induction times were significantly shorter in the LM-DPNB group (LM: 11’ vs. US: 13’; p=0.001). Groups did not differ significantly concerning pain scores, discharge times and oral analgesic consumption at home.

Conclusions: The US-DPNB did not provide better postoperative analgesia compared to the landmark DPNB after circumcision in children.
ESRA7-0522

ERECTOR SPINAE PLANE BLOCK IN PAEDIATRIC THORACIC SURGERY

Regue F.1, Veiga M.2, Trindade H.2, Lobo C.4, and Ferreira J.L.2 1Centro Hospitalar Setubal, Anaesthesiology, Setubal, Portugal. 2Hospital Central do Funchal, Anaesthesiology, Funchal, Portugal. 3Centro Hospitalar Lisboa Central, Anaesthesiology, Lisbon, Portugal. 4Hospital Militar Regional No1-Polo do Porto, Anaesthesiology, Porto, Portugal.

Background and Aims: Managing pain after thoracic surgery is challenging, with several options available, each with its limitations. The erector spinae plane block (ESPBB) is a recent analgesic approach for thoracic pain. We report a case of ESPBB for paediatric thoracic surgery.

Methods: A 1 y-o female, 10kg, ASA I, proposed for urgent video-assisted thoracoscopic pediatric surgery, bypassing some risks and limitations associated with deeper blocks or intravenous analgesia.

Results: The ESPBB has been described in adults, with two forms of injection: IBRAHIM S.

Background and Aims: The block of the sciatic nerve at the popliteal fossa can be performed using the ultrasound machine; it may be proximally or distally to the bifurcation of the sciatic nerve. It is frequently used for surgeries below the knee specially the foot and ankle operations.

Methods: Forty patients received ultrasound-guided sciatic nerve block with the nerve stimulator, using the posterior approach. The patients were enrolled into two groups (20 patients each), group 1: received one injection at 2 cm cephalad to the bifurcation of the sciatic nerve, and group 2: received two injections caudate to the sciatic bifurcation; one for tibial nerve and the other for common peroneal nerve. All patients received 20 ml of levobupivacaine 0.5%. The block performance time, block efficacy, success rate, complications and patient's satisfaction were evaluated.

Results: Block of the tibial and common peroneal nerves separately (two injections) distal to the point of bifurcation of the sciatic nerve has a significantly (p<0.05) faster time to complete sensory block of tibial and common peroneal nerves compared to a pre-bifurcation sciatic nerve block (one injection). The complete motor block, block time, success rate and patient's satisfaction were not significantly different between.

Conclusions: The block of tibial and common peroneal nerves separately distal to the sciatic nerve bifurcation is superior to single injection block of sciatic nerve above the bifurcation in the popliteal fossa as regard complete sensory block time.

Peripheral Nerve Blocks

ESRA7-0523

A COMPARATIVE STUDY BETWEEN THREE INJECTION TECHNIQUES OF ULTRASOUND-GUIDED AXILLARY BRACHIAL Plexus BLOCK

Eldegwy M., Al Azhar Faculty Of Medicine, Anesthesia And Intensive Care And Pain Management, Cairo, Egypt.

Background and Aims: Axillary brachial plexus block can be done by a double, triple, or quadruple injection. This prospective study compared the efficacy of an ultrasound-guided two injection technique with an ultrasound-guided three and four injections technique.

Methods: Sixty adult patients undergoing distal forearm or hand surgery were enrolled and randomized into three groups. Group 1: the patients received one injection at 6 o’clock position in relation to the axillary artery with injection of 18 ml of levobupivacaine 0.5%. Group 2: the patients received two injections, one of them at 6 o’clock position in relation to the axillary artery, while the 2nd injection at 12 o’clock position with injection of 9 ml of levobupivacaine 0.5% for each one. Group 3: the patients received three injections for Median, Radial, and Ulnar nerves with injection of 6 ml of levobupivacaine 0.5% for each nerve separately, while the musculocutaneous nerve is anesthetized with 6 ml in the three groups. The outcomes were block success rate, the performance time, onset time block, the incidence of adverse events, and intraoperative analgesia.

Results: The results showed that the performance time was significantly longer in the four-injection groups. Nevertheless, there were no differences in the performance time, onset time, success rate, block efficacy between the three groups.

Peripheral Nerve Blocks

ESRA7-0524

EVALUATION OF THE EFFECT OF THE ADDITION OF DEXMEDEXTOMIDINE IN THE AXILLARY BLOCK DURING UPPER LIMB SURGERY


Background and Aims: Although Dexmedetomidine (Precede) as an adjucent to local anaesthetics in a peripheral nerve block is still controversial concerning the efficacy and safety, it has been proposed by several teams to prolong the duration of a peripheral nerve block. We have tried in our study to evaluate the effect of the addition of Dexmedetomidine in the axillary block for wrist fracture surgery.

Methods: Sixty-four ASA I and II patients undergoing Kapandji procedure for wrist fracture were included and divided into two groups. Both groups had an axillary block by the same senior anesthesiologist. Group 1 received 30cc of Xylocaine 1.5% with Placebo, and Group 2 received 30cc of Xylocaine 1.5% with 50ug of predecex. We noted the operative duration, the post operative VAS at H2, H4, H8, H12, and the end of the motor block. The side effects evaluated were nausea/vomiting, bradycardia, drowsiness, and hypotension.
Results: The two groups were comparable for demographic data, surgical time and the incidence of side effects. As for pain, there was no significant difference in H2. In the Precedex group, however, there was a 58% decrease in H4, 39% H8, and 40% H12. Similarly, group 2 had an increase in the duration of the motor block of 56.9% (p < 0.01) and of the sensory block of 55.3% (p < 0.01). No patient had any neurological sequelae.

Conclusions: 50 μg of Dexametomidine associated with local anesthetics in an axillary block improves the quality of the nerve block and analgesia and does not increase side effects.

Peripheral Nerve Blocks
ESRA7-0510

ULTRASOUND GUIDED POPPLITEAL SCATIC BLOCK COMBINED WITH FEMORAL NERVE BLOCK FOR MANAGING A HIGH RISK PATIENT ON APIXABAN FOR I&D OF FOOT ABSCESSE
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Background and Aims: Current guidance is to avoid peripheral nerve blocks in the presence of anticoagulation. However in certain situations, where the risks of alternative techniques are high, then it may be appropriate to perform these blocks in the presence of anticoagulation. Here we present our management of a high risk anticoagulated patient who presented for incision and drainage of abscess using peripheral nerve blocks alone.

Methods: We were asked to pre-assess a 89 year old patient posted for I&D of an abscess of the foot. He had been admitted to hospital following falls and increased confusion and known to have COPD, hypertension, atrial fibrillation for which he was on apixaban and congestive cardiac failure. His exercise tolerance was only 10 yards and saturations were 87% on air.

Results: Ultrasound guided popliteal sciatic nerve and saphenous nerve block at the level of knee was performed. After 25 minutes there was almost complete motor block and surgery performed without any complications. There were no complications to report.

Conclusions: Peripheral nerve blocks in the presence of anticoagulation can be associated with complications. Most of these have been associated with deep blocks or with peripheral nerve catheters. If the risks for alternative techniques are high, then on a relative risk basis, there may be role for peripheral nerve blocks in the presence of anticoagulation. The use of ultrasound guidance, helps avoid injury to vascular structures, which might cause nerve injury through haematoma formation.

Peripheral Nerve Blocks
ESRA7-0566

ERECTOR SPINAE BLOCK: “NEW KIDS ON THE BLOCK” FOR SIMPLE MASTECTOMY
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Background and Aims: Erector spinae block (ESP) was first described in 2016 by Forero, as a valid alternative for thoracic analgesia. The authors described two cases of simple mastectomy under general anesthesia combined with ESP block.

Methods: Patient 1: female, 65 years old; healthy. Patient 2: male, 72 years old. High blood pressure.

Technique

Before performing the block, the patient was in the sitting position, under midazolam 1mg and fentanyl 0,05 mg. The T7 level was identified by palpation of inferior angle of the scapulae and then, T4 level under ultrasound control. The same anesthesiologist perform the ultrasound guided ESP block, using a parassagittal approach, linear probe and 50 mm needle and in plane approach, from cephalic to caudal, until T4 transverse process was felt. Afterwards, was injected 20 mL of 0,375% ropivacaine (LA) under the erector spinac muscle. In the second patient was used atracurium 5mg/ml, mixed with LA. After performing the ultrasound guided block, in both patient a laringeal mask airway was placed under general anesthesia.

Results: Both patients had an effective analgesia under ESP block. Pt 1, 35 min after block, became bradycardia (38 bpm) and pt 2 had an transitory increase in the heart rate (>30%baseline) immediately after injection of LA plus epinephrine and surgery performed without any complications. There were no complications to report.

Conclusions: Despite only applied in two patients, the ESP block reveals a good analgesia profile, easy and safe technique. The authors also confirm a similar profile to the paravertebral block, however with an extensive block and safer technique. It will be considered a good practice using concomitant dose test due to proximity of intercostal area.

Peripheral Nerve Blocks
ESRA7-0567

ERECTOR SPINAE BLOCK FOR LARAPROSCOPIC CHOLECYSTECTOMY
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Background and Aims: Despite the first description of cases for thoracic procedures (acute or chronic pain syndromes), Forero also describe ESP block for upper abdominal surgery. The authors present one case of using ESP for laparoscopic cholecystectomy and comparing it with another patient submitted to the same procedure.

The main goal was comparing intra and postoperative opioid analgesic consumption.

Methods: Patients are described in Table 1.

Peripheral Nerve Blocks
ESRA7-0540

EVALUATION OF 24-HOUR ANALGESIC EFFECT OF COMBINED US-GUIDED INTERSCALENE BRACHIAL PLEXUS BLOCK, SUPRASCAPULAR NERVE BLOCK AND AXILLARY NERVE BLOCK: PROSPECTIVE CASE SERIES
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Background and Aims: Interscalene brachial plexus block is the cornerstone of analgesia for invasive shoulder procedures and provides dense intraoperative and short-term postoperative anesthesia and analgesia. On the other hand, suprascapular and axillary nerve blocks ensure better analgesia 24 hours after surgery. The aim of this study was to evaluate a 24-hour effect of combined US - guided interscalene brachial plexus block, suprascapular nerve block and axillary nerve block in patients undergoing shoulder arthroplasty.

Methods: Seven patients undergoing elective shoulder arthroplasty received US-guided interscalene brachial plexus block, suprascapular nerve block and axillary nerve block before the operation, using 0.375% ropivacaine. The primary outcome was pain score during 24 hours after the operation, the secondary outcome was to evaluate sleep disturbance and patient satisfaction due to shoulder pain during the first night. All patients received multimodal analgesia with i/v paracetamol, p/o arcoxia and i/v metamizol after the operation. Morphine 10 or 30 mg p/o was used as rescue analgesic.
Peripheral Nerve Blocks

ESRA7-0559

THE APPLICATION OF A PARAVERTEBRAL BLOCK WITH LOW-DOSE LOCAL ANESTHETIC IN A PATIENT WITH BILATERAL OCCLUSION OF INTERNAL CAROTID ARTERIES: A CASE REPORT

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Background and Aims: Most breast surgeries are performed under general anesthesia; therefore, patients with present significant cardiovascular problems are at high risk for the development of hemodynamic and neurological disorders. Here we show the American Society of Anesthesiologists (ASA) IV patient scheduled for surgical quadrantectomy with the bilateral occlusion of internal carotid arteries. Due to a high risk for general anesthesia, we decided to apply unilateral paravertebral block.

Methods: 83-year-old female, ASA IV, was scheduled for surgical quadrantectomy with ipsilateral axillary lymphadenectomy of her left breast. The patient had bilateral occlusion of internal carotid arteries, arterial hypertension, dizziness syndrome, deafness and glaucoma. The patient had a stroke thirteen years ago with a consequent left-sided hemiparesis. During the preparation for the surgery, an invasive blood pressure measurement was set while the paravertebral space was identified with the neurostimulator using the linear ultrasound probe of 8 Hertz. The anesthetic 0.5% levobupivacaine was applied in levels of Thoracic (Th) 2, Th3, Th4 and Th5 (3 milliliters per level). We used 1% lidocaine for local infiltration at the site of the block.

Results: The intraoperative fentanyl consumption and 83-year-old female, ASA IV, was scheduled for surgical quadrantectomy with the bilateral occlusion of internal carotid arteries. We used 1% lidocaine for local infiltration at the site of the block.

Conclusions: The combination of ultrasound and neurostimulator in the application of a paravertebral block enables us to achieve high precision. Such administration of small doses of long-acting local anesthetic at multiple levels has resulted in a satisfactory anesthesia and analgesia without hemodynamic and neurological complications.

Postoperative Pain Management

ESRA7-0533

COMBINATION OF INTRANOVUS AND SPINAL ANALGESIA PLUS TAP BLOCK GIVES A BETTER CONTROL OF POSTOPERATIVE PAIN THAN MULTIMODAL INTRANOVUS ANALGESIA AFTER RARP

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Background and Aims: The prostate cancer (PC) is the most common cancer for men. Robotic assisted radical prostatectomy (RARP) is a new technology, improving survival after surgical treatment. Optimal intra and postoperative pain management is required after RARP.

Methods: Forty-six patients with RARP for PC were randomized in prospective study comparing two groups with different approach for intra and postoperative pain management. First group were patients with multimodal intravenous analgesia and second group: with spinal analgesia plus TAP block. Visual analogue pain score (VAS) at rest and during movement at 6, 12 and 24 hours after surgery, was used to study the pain and to optimize the morphine needs in both groups. Descriptive, central tendency statistics of VAS points and opioid dosages and Student t tests were used to compare the groups.

Results: Pain at rest at 6 and 24 hours after surgery shows significant difference between the two groups (6h: 3.08±0.3 mm vs 2.33±2.25 mm, P < 0.05; 12h: 1.0 ±0.1 vs 0.98±0.10 mm, P <0.05). We didn’t find the difference between VAS at rest at 12 hours in two groups. We noticed significant difference between two groups in: VAS during movement at 6,12 and 24 hours after surgery, in the morphine consumption and in intraoperative use of opioids (520 ±40 µg fentanyl vs 270 µg±55fentanyl P < 0.05).

Conclusions: The use of multimodal intravenous nonopioid analgesia is insufficient to reach a good control of pain but in combination with other techniques of locoregional analgesia we could found a good level of pain control.

Postoperative Pain Management

ESRA7-0549

COMPARATIVE STUDY BETWEEN BILATERAL SUPERFICIAL CERVICAL PLEXUS BLOCK ALONE AND WHEN COMBINED WITH BILATERAL GREATER OCCIPITAL NERVE BLOCK FOR POST-THYROIDECTOMY ANALGESIA

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Background and Aims: This prospective study compared the post-operative analgesic efficacy of ultrasound guided bilateral superficial cervical plexus block (BSCPB) alone and with combination with bilateral greater occipital nerve block (BGodNB) in patients undergoing thyroidectomy.

Methods: 63 adult patients undergoing thyroid surgery are enrolled and randomized into three groups(21 patients each). Group1 (n=21) patients received bilateral(BSCP) only, Group 2 (n=21) patients receiving bilateral (BSCP) and (GONB), Group 3 (n=21): patients received no block. Levobupivacaine of 0.5 % (6 ml) in each side for BSCPB and (3 ml) in each side for BGoNB The primary outcome were intraoperative fentanyl consumption, occipital headache, posterior neck, and incision site pains was made at 1, 6, 12 hours and 24 hours after extubation by Visual Analogue Scale (VAS). While the secondary outcomes were postoperative morphine consumption, and the incidence of nausea, vomiting.

Results: The results showed that the intraoperative fentanyl consumption and total post-operative morphine consumption within 24 h were significantly higher (P<0.05 in the group 3 compared to groups 1 and 2).The mean VAS scores and the proportion of patients with VAS score>4 for post-operative pain at rest and on swallowing showed significantly higher at 6 h and 12 h after surgery in group 3 compared to group 1 and 2 with p-value<0.05. As regards mean VAS scores and proportion of patients with VAS score>4 for headache and posterior neck pain after surgery at times[land]were significantly lower in Group2, compared to Group1 and 1 in Group1. In Group2 compared to group 3.

Conclusions: The combination of BSCPB with BGoNB blocks was more effective than BSCPB alone in management of pain in thyroid surgery.

Postoperative Pain Management

ESRA7-0516

FACTORs INFLUENCING PATIENT SATISFACTION ON POSTOPERATIVE PATIENT-CONTROLLED ANALGESIA (PCA) AT KING CHULALONGKORN MEMORIAL HOSPITAL

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Background and Aims: Patient-controlled analgesia (PCA) has been shown to ameliorate the clinical outcome and previous studies investigating the use of patient-controlled analgesia have included evaluation of patient satisfaction. This study aims to identify the factors that influence patient satisfaction on post-operative patient-controlled analgesia at King Chulalongkorn Memorial Hospital.

Methods: This prospective and descriptive study collected data from two hundred and eighty patients over 18 years of age undergoing elective and emergency surgery under anesthesia with postoperative patient-controlled analgesia provided under supervision and care of acute pain service at King Chulalongkorn Memorial Hospital from October 2013 to September 2014. At in-patient unit, Verbal Numeric Rating Scale (VNRS) for pain intensity and patient satisfaction score (0-10; 0= worst and 10=best) for postoperative pain assessment of 280 patients were recorded by acute pain staffs at 24th hour and end of service. The data were statistically analyzed by SPSS version 22. Categorical data and continuous data were analyzed by Chi-square tests and unpaired t-test respectively. Multiple logistic regression was also used. P <0.05 was considered statistically significant.

Results: At the end of the study, 85.4% of patients reported satisfaction score ≥ 8. Factors associated with good satisfaction score were lower VNRS, P= 0.006. Odd ratio = 0.316 (95%CI=0.140-0.716) and absence of vomiting, P= 0.003. Odd ratio=0.327 (95%CI=0.155-0.691)

Conclusions: Majority of the patients at the end of acute pain service reported high level of satisfaction on postoperative patient-controlled analgesia (PCA). Factors contributing to high satisfaction were lower VNRS and absence of vomiting.

Postoperative Pain Management

ESRA7-0556

ULTRASOUND GUIDED TRANSVERSE ABDOMinis PLANE BLOCK AND BILATERAL RECTUS SHEATH BLOCK, ADJUNCT TO IV MORPHINE PCA IN LIVE DONOR HEPATECTOMY: DOUBLE BLIND RANDOMIZED COMPARISON TRIAL

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Background and Aims: 1. Addressing crucial issue of perioperative pain management in live related healthy liver donors.
2. Finding a safe and effective tool for acceptable analgesia in liver donors.
3. Assessing impact of combination of Transverse Abdominis Plane block And bilateral Rectus Sheath block to decrease requirement of Morphine post-operatively along with improving in respiratory and metabolic parameters

Methods: The study was planned as a prospective randomized double blind study. 50 consecutive live donors belonging to age group 18-50 years were randomized into two groups of 25 each. Patients in both the groups received a standard general anesthetic. All patients were given right subcostal TAP block and bilateral rectus sheath blocks under ultrasound guidance at the end of surgery. Group R patients received the blocks with 50 ml of 0.3% Ropivacaine; with 10 ml each for rectus sheath blocks and 30ml for subcostal TAP block using under ultrasound guidance. Group S patients received the same blocks with 50 ml of Normal Saline at the end of surgery. Patients in both the groups had access to morphine PCA.

Results: Median morphine consumption was found to be significantly less (28 mg vs. 43 mg, p=0.020) in Group I patients. The Numerical Rating Scores (NRS) were comparable in both the groups. No major block related complications were observed.

Conclusions: We found subcostal TAP block in combination with bilateral rectus sheath blocks a safe and effective adjunct for pain management in patients undergoing donor hepatectomy.

Postoperative Pain Management

ESRA7-0534

THE IMPACT OF CONTINUOUS THORACIC PARAVERTEBRAL BLOCK ON THE RATE OF POST-OPERATIVE ATRIAL FIBRILLATIONS AFTER MINIMALLY INVASIVE CARDIAC SURGERY: A PROPENSITY-SCORE-MATCHED ANALYSIS

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Background and Aims: Postoperative atrial fibrillation (POAF) frequently occurs after cardiovascular surgery and has been related to increased morbidity and mortality. Increased post-operative pain and sympathetic tone are some of the many factors contributing to the development of POAFs. The effect of continuous thoracic paravertebral block (TPVB) on the prevention of POAFs after minimally invasive cardiac surgery for mitral valve repair (MICS-MVR) has not been well studied. We hypothesized a TPVB could provide a protective effect against the onset of POAFs as seen in epidual anesthesia after cardiac surgery.

Methods: We designed a propensity score-based matched retrospective study at our center. The occurrence of POAF was defined as the persistence of atrial fibrillation for at least 1 hr. Ninety-five consecutive patients were assessed and 78 patients were grouped to either the continuous TPVB group (continuous TPVB with general anesthesia [GA]), n=54) or the no-TPVB group (GA alone; n=24). Ultrasound guided unilateral right side catheter placement was done prior to surgery for patients in the continuous TPVB group. A propensity-score based matching between groups with a 1:1 ratio was performed. The matching yielded a final cohort of 38 patients for the primary outcome analysis.

Results: Continuous TPVB group had significantly lower rates of POAF than the no-TPVB group, 15.8% versus 52.6%, respectively. (Odds ratio 0.169; 95% confidence interval 0.037-0.777, p=0.022) However, TPVB did not significantly reduce in the mean 24-hr postoperative morphine equivalent consumption or the time to extubation. There were no complications related to the use of TPVB.

Conclusions: Continuous TPVB reduced the occurrence of POAFs in patients undergoing MICS-MVR.

Postoperative Pain Management

ESRA7-0557

EFFECTS OF PALONOSETRON FOR PROPHYLAXIS OF POSTOPERATIVE NAUSEA AND VOMITING IN HIGH-RISK PATIENTS UNDERGOING TOTAL KNEE ARTHROPLASTY: A PROSPECTIVE, RANDOMIZED, DOUBLE-BLIND, PLACEBO-CONTROLLED STUDY

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Background and Aims: The preemptive multimodal pain protocols used in total knee arthroplasty (TKA) often cause emesis postoperatively. We investigated whether palonosetron prophylaxis reduces postoperative nausea and vomiting (PONV) in high-risk patients after TKA.

Methods: We randomized 120 patients undergoing TKA to receive either palonosetron or no antiemetic prophylaxis (control group). All patients were given spinal anesthesia, a continuous femoral nerve block, and fentanyl-based intravenous patient controlled analgesia. Patients undergoing staged bilateral TKA (1-week interval) were assigned to one group according to the first knee. The incidence of PONV, severity of nausea, complete response, requirement for rescue antemetics, pain level, opioid consumption, and satisfaction scores were evaluated during three periods: 0–2, 2–24, and 24–48 h postoperatively.

Results: The incidence of PONV during the first 48 h was lower in the palonosetron group compared with the controls (22 vs. 41%, p = 0.028), especially 2–24 h after surgery, as was the nausea and vomiting respectively. The severity of nausea was lower in the palonosetron group (p = 0.010). The complete response rate (93 vs. 73%, p = 0.016) and satisfaction score (p = 0.032) were higher in the palonosetron group during 2–24 h after surgery. Patients who underwent a second operation complained of more severe pain, and consumed more opioids than those of the first operation.

Conclusions: Palonosetron prophylaxis reduced the incidence and severity of PONV in high-risk patients managed with multimodal pain protocol for 48 h, notably 2–24 h after TKA.
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Background and Aims: The most common symptoms of breast cancer are: lumps, pain and nipple discharge. The aim of the project was to assess role of regional anesthesia (RA) and quality of life of the patients during central quadrantectomy.

Methods: The study was designed as prospective clinical trial. Of the 128 patients with pathological nipple discharge, pathological changes in the mammary ducts were reported in 72 patients who were qualified for surgery. At the time of local anesthesia, 1% lignocaine was administered in an amount of approximately 15-20 ml. After FDS examination in patients with PND the pain level and the level of distress were assessed by VAS (Visual Analog Score). Ethics approval No NKEBN/466/2004.

Results: In patients who had central quadrantectomy performed in RA pain was assessed by means of VAS scale. Mean of pain intensity among examined patients was 1.5 (mean 1.6) according to VAS scale. Pain was experienced by 55 (42.9%) patients. Mild and moderate pain was in 49 (38.3%) and 24 (18.8%) respectively.

Mean level of distress was 1.6 (mean 1.7). In 60 (46.9%) examined patients with PND no level of distress or discomfort caused by FDS was noted. In 52 (40.6%) patients a slight level of distress was noted.

Conclusions: The use of regional analgesia is an optimal method of preparation patients prior to central quadrantectomy. Regional analgesia onto the nipple before central quadrantectomy is a good method to alleviate the post-operative pain and lower the distress.