Coll. Antropol. **34** (2010) Suppl. 1: 125–128
Original scientific paper

Laparoscopic Cholecystectomy in Cantonal Hospital Livno, Bosnia and Herzegovina and University Hospital Center Split, Croatia

Branko Perić[1], Zdravko Perko[2], Zenon Pogorelić[2] and Jasenka Kraljević[2]

[1] »Dr. Fra Mihovil Sučić« Cantonal Hospital, Livno, Bosnia and Herzegovina
[2] Department of Surgery, University Hospital Center and School of Medicine, Split, Croatia

A B S T R A C T

Cholecystectomy is the most frequently performed operation in abdominal surgery. The aim of this study was to compare the operative procedure and outcomes of the laparoscopic cholecystectomy in two hospitals, the University Hospital Center Split and the Regional Hospital in Livno. A total of 97 patients who underwent laparoscopic cholecystectomy for cholelithiasis at University Hospital Center Split and 86 patients from Regional Hospital in Livno, both groups sampled in 2005 were included in this study. Differences in patients' age, gender, operation time, total hospital stay, number of trocarsž ports, antibiotic and parenteral therapy, and complications were analyzed. There were significantly fewer men than women who underwent laparoscopic cholecystectomy in both hospitals. The mean age of the patients undergoing laparoscopic cholecystectomy at University Hospital Center Split was higher than that of the patients at Regional Hospital in Livno. The operation time was shorter at the University Hospital Center Split than that at Regional Hospital in Livno. There was a significant difference, in favor of the University Hospital Center Split, in the number of patients who received postoperative antibiotics and parenteral therapy, with fewer patients who received postoperative therapy in Split. At the Regional Hospital in Livno fewer trocars were used for laparoscopic cholecystectomy. The average hospital stay of patients undergoing laparoscopic procedures at University Hospital Center Split was shorter than that of patients at Regional Hospital in Livno. Two complications occurred in postoperative period at the University Hospital Center Split and one complication was noticed in hospital in Livno. In conclusion, there were no major complications in postoperative period. It is also encouraging to find that there was significant improvement of surgical approach and technique at the hospital in Livno during the period of time analyzed in this study.

Key words: *laparoscopic cholecystectomy, regional hospital, university hospital*

Introduction

Cholecystectomy is the most frequently performed operation in abdominal surgery. The majority of people with gallstones never become symptomatic. Each year, about 1–4% of patients with asymptomatic gallstones develop symptoms, usually biliary colic or one of the complications of gallstone disease[1].

Cholecystectomy is the treatment of choice for symptomatic gallstones. Until recent years the prevailing treatment of symptomatic gallstones was an open cholecystectomy (the removal of the gallbladder through the lengthy right-upper-quadrant or midline abdominal incision), a fairly morbid procedure associated with a prolonged recovery. Efforts to diminish the morbidity of open cholecystectomy have led to the development of laparoscopic cholecystectomy. The main goal of both laparoscopic and open cholecystectomy is removal of the gallbladder with minimal risk of injury to surrounding structures. The morbidity associated with cholecystectomy is due to injury to the abdominal wall during the process of gaining access to the gallbladder or to inadvertent injury to surrounding structures in the process of dissection of the gallbladder. The difference between open and laparo-

Received for publication March 31, 2009

scopic cholecystectomy is the mode of abdominal access. As laparoscopic incisions are much smaller than those created during laparotomy incision-related complications are greatly reduced. This gives laparoscopic surgery the advantage of reduced post-operative pain, scarring, and recovery time and that is the reason why it is adopted as so-called gold standard for treatment of symptomatic gallstone disease[2,3].

The aim of this study was to compare laparoscopic cholecystectomy regarding operative procedure and outcomes between two hospitals, the University Hospital Center Split, Croatia, and the Cantonal Hospital in Livno, Bosnia and Herzegovina. The main hypothesis for our study was formulated as follows. There is no significant difference between operative procedure and outcomes of laparoscopic cholecystectomy in Cantonal Hospital and those at the University Hospital Center. For this reason, we suggest that laparoscopic cholecystectomy offers the same benefits for patients in Cantonal Hospital as those observed in larger University Hospital Center. Therefore, it could be the operative treatment of choice for symptomatic gallstones in Cantonal Hospital. In order to prove our hypothesis, the patients' data from two hospitals was assessed, validated, compared and analyzed retrospectively.

Patients and Methods

Data from two groups of patients, 97 from the University Hospital Center Split (LCSt) and 86 from Cantonal Hospital in Livno (LCLi), who underwent laparoscopic cholecystectomy for cholelithiasis between 1 January 2005 and 31 December 2005 were retrospectively reviewed. Differences in patients' age, gender, operation time, total hospital stay, number of trocar ports, antibiotic and parenteral therapy, intraoperative and postoperative complications were analyzed. Statistical analysis was based on the Student's t-test and chi-square test using the software program Microsoft Excel for Windows Version 11.0 (Microsoft Corporation, USA and Statistica for Windows Release 12.0 (Statsoft Inc, USA). Results of $p<0.05$ were considered statistically significant.

The patients undergoing laparoscopic cholecystectomy were prepared and draped in similar fashion to open procedure. They were submitted to general anesthesia with endotracheal intubation, mechanical ventilation, and the muscle relaxants administration, and positioned in European positioning. With European positioning, the operating surgeon was positioned between patient's legs, and the first assistant stood on the patient's left. The first step was the creation of pneumoperitoneum and the insertion of an initial trocar through which the laparoscope is passed. A 10 mm supraumbilical incision was made and a Veress needle was then inserted through the fascia and the peritoneum into the abdominal cavity. This was accomplished by elevating the abdominal wall and angling the needle at 90°. The insufflator was then attached to the needle and inflating of the abdomen with CO_2 began. When a pressure of approximately 12 mmHg was reached, the Veress needle was withdrawn, and a first 10 mm trocar was inserted through the same incision into the abdominal cavity. Once the initial trocar was inserted, proper positioning was confirmed by placing the laparoscope with attached video camera. A second 5 mm, and a third 10 mm trocar were placed after the initial laparoscopic examination of the peritoneal cavity. Once the grasping forceps and dissector were inserted through accessory ports, the area of Calot's triangle was exposed. At this point cystic duct and cystic artery were identified. Two clips were placed distally on the cystic duct and one proximally. The duct was then divided, under the proximal clip. The next step was the division of the cystic artery. The artery and any branches were controlled with placement of clips and then divided. The gallbladder was then dissected out of the gallbladder fossa using hook and electrocautery. Once resected, the gallbladder was retrieved from the abdominal cavity through the umbilical port by using grasping forceps. The decision to place a drain was governed by the same principles applied to open cholecystectomy. The fascial opening at the umbilicus was sutured closed to prevent subsequent herniation, and all skin incisions were closed.

Results

There were principal differences in terms of patient characteristics and procedure statistics. There was significantly larger number of women compared to men, who underwent laparoscopic cholecystectomy in both hospitals (Table 1). The mean age of the patients undergoing laparoscopic cholecystectomy at University Hospital Center Split was higher (55.16±13.97) comparing to patients at Cantonal Hospital in Livno (41.66±13.40, $p<0.0001$, Table 2). The operation time was shorter at the University Hospital Center Split (86±21.78) than at Cantonal Hospital in Livno (92±26.51, $p<0.0001$, Table 2). At the Cantonal Hospital in Livno fewer trocars (3±0) were used for laparoscopic cholecystectomy comparing to operative procedure in Split (3.25±0.46, $p=0.005$, Table 2). The average hospital stay of patients undergoing laparoscopic procedures at University Hospital Center Split was shorter (2.45±1.13) than that of patients at Cantonal Hospital in Livno (3.4±1.04, $p<0.0001$, Table 2). There was a significant difference, in favor of the University Hospital Center Split, in the number of patients who received postoperative antibiotics and parenteral therapy. Number of patients who received antibiotics was significantly smaller at the University Hospital Center Split (21.6%) comparing to Livno (43%, $p=0.001$, Table 3). Major differences between two groups were also noted in

TABLE 1
COMPARISON OF PATIENTS REGARDING GENDER

	Men		Women		p	
Split	33	34%	64	66%	p<0.0001	p=0.016
Livno	16	18.60%	70	72.20%	p<0.0001	

TABLE 2
COMPARISON OF PATIENTS REGARDING AGE, OPERATION TIME, HOSPITAL STAY, AND AMOUNT OF ADMINISTERED PARENTERAL FLUID THERAPY

	min	max	$\overline{X}$	SD	p
Age (years)					
Split	26	83	55.16	13.97	p<0.0001
Livno	19	73	41.66	13.40	
Operation time (minutes)					
Split	40	160	86	21.78	p<0.0001
Livno	40	180	92	26.51	
Number of trocars					
Split	3	5	3.25	0.46	p=0.005
Livno	3	3	3.00	0.00	
Duration of hospital stay (days)					
Split	1	7	2.45	1.13	p<0.0001
Livno	2	9	3.4	1.04	
Amount of administered parenteral fluid therapy					
Split	4	14	5.44	2.12	p<0.0001
Livno	4	20	7.34	1.65	

min – minimum, max – maximum, $\overline{X}$ – average, SD – standard deviation

amount of other postoperative parenteral fluid therapy administered (5.44±2.12 in Split, and 9.34±1.65 in Livno, p<0.0001, Table 2). There was no statistically significant difference in number of postoperative complications among two groups (p=0.564). Two complications occurred at the University Hospital Center Split and one complication was noticed in Cantonal Hospital in Livno (Table 3).

Discussion and Conclusion

Laparoscopic cholecystectomy has rapidly become established as the treatment of choice for treatment of symptomatic gallstones. The main advantages of laparoscopic surgery include better cosmetic results, decreased postoperative pain, and faster functional recovery. To reveal whether the results of laparoscopic cholecystectomy in the large university hospital and smaller cantonal hospital could be comparable, we analyzed the data on 183 patients (97 from University Hospital Center Split and 86 from Cantonal Hospital in Livno) who underwent this operative procedure.

TABLE 3
COMPARISON OF PATIENTS REGARDING AMOUNT OF ADMINISTERED ANTIBIOTICS AND NUMBER OF POSTOPERATIVE COMPLICATIONS

	Da		Ne		p
Administered antibiotics					
Split	21	21.60%	76	78.40%	p=0.001
Livno	37	43%	49	57%	
Number of postoperative complications					
Split	2	2.10%	95	97.90%	p=0.564
Livno	1	1.20%	85	98.80%	

Statistically significant age and gender differences were observed. There was significantly higher number of women who underwent laparoscopic cholecystectomy in both groups. This is attributed to the higher prevalence of gallstones in females in all adult age groups. The age differences, with older patients who underwent operation at the University Hospital Center Split, are at least partly due to different criterion of selection of patients for laparoscopic procedure. At Cantonal Hospital in Livno, a patient age was important evaluation factor for patients who were candidates for laparoscopic cholecystectomy. On the other hand, the age was not important as a factor of preoperative evaluation at University Hospital Center Split[4]. Moreover, we discovered that the operative time was significantly shorter at University Hospital Center Split. This may, however, be attributed to more experienced and better equipped laparoscopic team at University Hospital Center. At the Cantonal Hospital in Livno fewer trocars were used for laparoscopic cholecystectomy comparing to operative procedure in Split. There are few important contributing factors, including differences in education of laparoscopic surgeons (three in preference of four trocars' method) and selection of younger patients with lower body mass index for operative treatment. A drain was routinely placed after laparoscopic cholecystectomy in patients at Cantonal Hospital in Livno, while drains were rarely necessary at University Hospital Center Split, and were most often placed when there was concern about biliary leakage. For this reason, the average hospital stay was longer at Cantonal Hospital in Livno comparing to University Hospital Center Split[5,6]. There was a significant difference in total quantity of postoperative antibiotics and parenteral fluid intake. Number of patients who received antibiotics was significantly lower at the University Hospital Center Split comparing to Livno. The amount of parenteral fluids (expressed in number of bottles) administered in Livno was twice the amount of parenteral fluids administered in Split. These results suggest that more experienced and better trained surgeons at University Hospital Center expect less postoperative complications, and thus administer lower dose of antibiotics and parenteral fluids in postoperative period. However, regardless of different operative and postoperative protocols, there was no statistically significant difference in number of postoperative complications among two groups. Two complications occurred at the University Hospital Center Split and one complication was noticed in Cantonal Hospital in Livno. These results are comparable to the published major series of laparoscopic cholecystectomy[7].

In conclusion, this study suggest that it is possible to perform a laparoscopic cholecystectomy in small cantonal hospital with as good results as in large university hospital.

REFERENCES

1. ČALA Z, BAĆA I, BRAJŠA M, Temelji endoskopske kirurgije (Art studio Azinović, Zagreb, 2001). — 2. PERKO Z, ČALA Z, DRUŽIJANIĆ N, Endoskopska kirurgija: Instrumenti i oprema (Knjigotisak, Split, 2001). — 3. KUMAR M, AGRAWAL CS, GUPTA RK, JSLS, 11 (2007) 358. — 4. KIRSHTEIN B, BAYME M, BOLOTIN A, MIZRAHI S, LANTSBERG L, Surg Laparosc Endosc Percutan Tech, 18 (2008) 334. — 5. KIM JY, KIM KW, AHN CS, HWANG S, LEE YJ, SHIN YM, LEE MG, AJR Am J Roentgenol, 191 (2008) 783. — 6. PERKO Z, BILAN K, POGORELIĆ Z, SRŠEN D, DRUŽIJANIĆ N, KRALJEVIĆ D, JURIČIĆ J, MIMICA Ž, JURIŠIĆ T, BEKAVAC-BEŠLIN M, Hepatogastroenterology, 54 (76) (2007) 1009. — 7. SHAMIYEH A, DANIS J, WAYAND W, ZEHETNER J, Surg Laparosc Endosc Percutan Tech, 17 (2007) 271.

Z. Perko

Department of Surgery, University Hospital Center Split, Spinčićeva 1, 21000 Split, Croatia
e-mail: zperko@kbsplit.hr

LAPAROSKOPSKA KOLECISTEKTOMIJA U ŽUPANIJSKOJ BOLNICI LIVNO, BOSNA I HERCEGOVINA I KLINIČKOM BOLNIČKOM CENTRU SPLIT, HRVATSKA

SAŽETAK

Odstranjenje žučnog mjehura, kolecistektomija, jedan je od najčešćih zahvata u kirurgiji. Cilj ove studije je usporediti laparoskopsku kolecistektomiju u Kliničkom bolničkom centru u Splitu i Županijskoj bolnici u Livnu. U periodu 01.01.2005. – 31.12.2005. godine retrospektivno su analizirani podaci bolesnika koji su operirani laparoskopskim načinom, 97 bolesnika iz Splita i 86 bolesnika iz Livna. Analizirane su razlike u spolu, dobi bolesnika, duljini trajanja operacije, prosječnoj dužini ležanja u bolnici, broju korištenih troakara, količini primijenjene antibiotske i parenteralne terapije te broju poslijeoperacijskih komplikacija. Postoji statistički značajno veći broj operiranih žena u odnosu na muškarce u obje bolnice. Prosječna dob bolesnika operiranih u Splitu značajno je viša u usporedbi na onu bolesnika operiranih u Livnu. Operacijski zahvati su trajali kraće, kraća je bila prosječna duljina ležanja u bolnici, poslijeoperacijski je korištena manja količina antibiotika i parenteralne terapije kod bolesnika operiranih u Splitu u odnosu na bolesnike operirane u Livnu. U Livnu je korišten manji broj troakara, što se može objasniti biranjem »pogodnijih« i mlađih bolesnika za laparoskopski zahvat. Najvažnije je da ni u Livnu ni Splitu u promatranom razdoblju nije bilo težih komplikacija. Od ukupnog broja operiranih bolesnika u Splitu samo su dva bolesnika razvila poslijeoperacijske komplikacije, a u Livnu je poslijeoperacijske komplikacije razvio jedan bolesnik. Smatramo da je doprinos ovog rada promjena stavova u liječenju i načinu izvođenja laparoskopske kolecistektomije u Livnu što će doprinijeti još boljem poslijeoperacijskom ishodu.