

# Torsion of Epiploic Appendage Mimic Acute Appendicitis

Zenon Pogorelić<sup>1</sup>, Radoslav Stipičić<sup>2</sup>, Nikica Družijanić<sup>2</sup>, Zdravko Perko<sup>2</sup>, Leo Grandić<sup>2</sup>, Katarina Vilović<sup>3</sup>, Ivana Mrklić<sup>3</sup>, Ivo Jurić<sup>1</sup>, Vladimir Boschi<sup>2</sup> and Josip Bekavac<sup>2</sup>

<sup>1</sup> University of Split, Split University Hospital Center, Department of Pediatric Surgery, Split, Croatia

<sup>2</sup> University of Split, Split University Hospital Center, Department of Surgery, Split, Croatia

<sup>3</sup> University of Split, Split University Hospital Center, Department of Pathology, Split, Croatia

## ABSTRACT

*Epiploic appendagitis is a rare cause of focal abdominal pain which, depending on its localisation, can mimic a variety of abdominal diseases. We report a case of 36-year-old woman who presented with a classic signs of acute appendicitis. On examination, the obese, afebrile, and had very strong right iliac fossa tenderness and guarding. The white cell count was  $12.82 \times 10^9/L$ , and C reactive protein count was 15.13MG/DL. She underwent emergency laparoscopic procedure after the acute appendicitis diagnosis has been established. Laparoscopic exploration of the abdominal cavity showed vermiform, no inflamed, appendix and necrotic appendix epiploica of the caecum. The treatment consisted of typical laparoscopic appendectomy and laparoscopic resection of the necrotic appendix epiploica. The patient made rapid recovery and was discharged from the hospital on second day after the operation. Histological investigation of the appendix epiploica revealed gangrenous epiploic appendage.*

**Key words:** epiploic appendage, torsion, infarction, acute appendicitis, laparoscopy

## Introduction

Appendices epiploicae, also referred as epiploic appendages are fatty appendages, originating in two rows parallel to the external surface of the three longitudinal muscle bands of the large intestine known as tenia coli. A normal adult human being usually has about 50–100 appendices epiploicae<sup>1,2</sup>.

Epiploic appendages are between 0.5 and 5 cm long, each accompanied by one or two arterioles and venule which is present in its vascular stalks attached to the colon<sup>1</sup>.

The epiploic appendages vary considerably in size, shape, and contour. For unclear reasons, they are largest and most prominent in obese persons and in those who have recently lost weight<sup>3</sup>. They are presumed to serve a protective and defensive mechanism similar to that offered by the greater omentum. They may also act as a protective cushion during peristalsis<sup>4</sup>.

Torsion of epiploic appendage is rare, but can result in ischemia presenting as an acute clinical condition which can mimic acute appendicitis, cholecystitis, diverticulitis or other more serious causes of acute abdominal pain.

The vein, which is longer than the artery by virtue of its tortuous course, alters the anatomy such that the pedicle is predisposed to twisting. Besides torsion, which is the most likely pathophysiological mechanism, spontaneous venous thrombosis of an appendage vein is another uncommon cause of primary epiploic appendagitis<sup>5,6</sup>.

The sigmoid colon and the caecum are the predominant physiological sites of appendage occurrence. However, the sigmoid colon is more frequently affected than the caecum<sup>7</sup>. Anatomically, the pain is therefore usually located in the left or right lower abdominal quadrant. Due to the lack of pathognomic clinical features the diagnosis of epiploic appendagitis is difficult. It is also very infrequent, causing awareness among general surgeons for this clinical condition to be missing sometimes<sup>8</sup>.

## Case Report

A 36-year-old woman presented with a 24 hours history of right iliac fossa pain with very strong right iliac

fossa tenderness and guarding. She had no nausea or vomiting and no urinary or bowel complications. On examination, the obese, afebrile and her vital signs were all well within normal limits. Grassman, Bloomberg I and II, Kruger, Perman, Rowsing, Mc Burney, Owing and Hedry clinical tests for acute appendicitis were positive. The white cell count was  $12.82 \times 10^9/L$  (normal range;  $4-10 \times 10^9/L$ ), and C reactive protein was 15.13MG/DL (normal range; 0–5MG/DL). All other laboratory studies showed normal values. After physical and laboratory examination, the patient underwent plain abdominal radiographic evaluation that showed no pathological changes.

The patient underwent laparoscopy with diagnosis of acute appendicitis. A pneumoperitoneum was installed through Veress needle and three trocars were inserted. The first 10mm trocar was inserted supraumbilically and other two 5mm trocars were inserted in left lower and right upper quadrant. Laparoscopic exploration of abdominal cavity revealed vermiform, no inflamed, appendix and necrotic, twisted, appendix epiploica of 5cm size of the caecum in the anterior surface (Figure 1). There was no mesenteric lymphadenopathy and Meckel's diverticulum was not detected. We performed typical laparoscopic appendectomy using harmonic scalpel (UltraCision®, Ethicon Endo Surgery, J&J, USA). The base of appendix was ligated with endo-loop. Finally we performed laparoscopic resection of the necrotic appendix epiploica using harmonic scalpel.

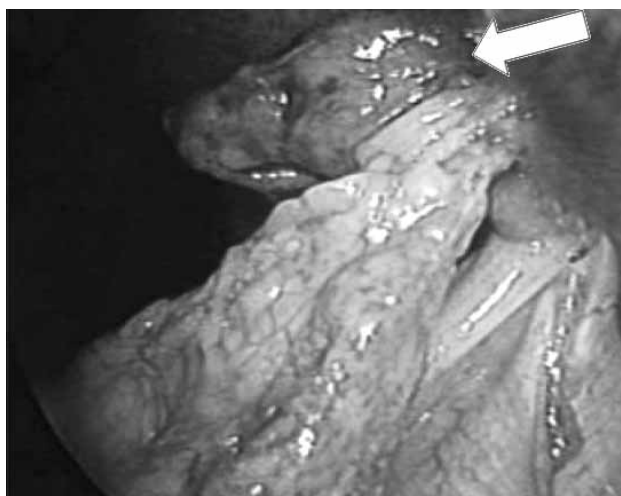


Fig. 1. Intraoperative finding – A gangrenous epiploic appendage.

After the operation, the patient was treated on a general surgical ward. All the postoperative time the patient was afebrile and completely tolerated *per oral* diet. The patient made rapid recovery and was discharged from the hospital on second day after the operation. Histological investigation of the appendix epiploica revealed infarct of the appendix epiploica, necrotic adipose tissue with surrounding hemorrhage and infiltration of mononuclear cells (Figure 2).

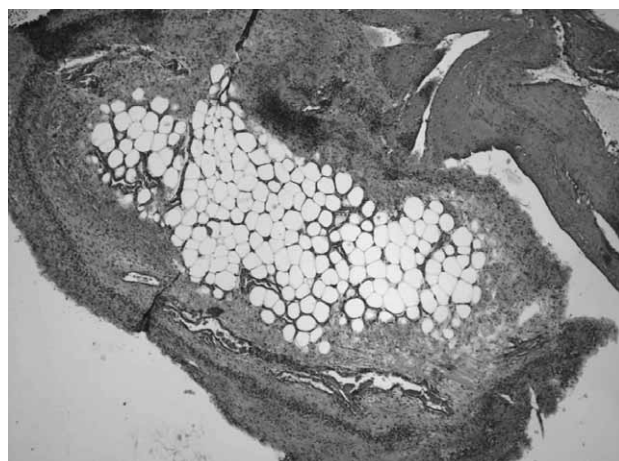


Fig. 2. Pathologic finding – Necrotic adipose tissue with surrounding hemorrhage and infiltration of mononuclear cells. (Hematoxylin and eosin staining, conventional light microscopy, mag-

## Discussion

The epiploic appendices are located on the antimesenteric border of the colon, mainly the sigmoid colon and the cecum<sup>1,9</sup>. Fifty to hundred epiploic appendages span the entire colon. It is speculated that these structures may have a local bacteriostatic or anti-inflammatory function. They may cushion the colon during peristalsis, and they may act as a reservoir for blood when the colon and its blood vessels contract<sup>8</sup>.

Diseases of the epiploic appendices are most common in the 3rd and 4th decades of life, although they have been reported in a wide range of ages, ranging from 8 to 82 years of age<sup>9-11</sup>. Men and women are equally affected<sup>10</sup>. The right iliac fossa remains the most common site for the pain and tenderness, even if the sigmoid colon is the affected site.

Complications related to the epiploic appendices include diverticulitis, intestinal obstruction secondary to adherence to small bowel, and torsion and infarction. Torsion and infarction are more common in obese patients where the epiploicae are bulky, and are usually found in the sigmoid colon where the epiploicae are longest<sup>9</sup>.

Pathophysiologically a twisting, kinking or stretching of epiploic appendages along their long axis with impairment of vascular supply, subsequent venous thrombosis and necrosis is the pathophysiological sequence which, depending on localization and severity, can mimic a variety of underlying causes of abdominal conditions<sup>1,12</sup>.

The site of pain may vary depending on the location of the appendage involved and may mimic acute appendicitis, cholecystitis or diverticulitis. In contrast to large bowel diverticulitis which shows mild smooth bowel thickening without lymphadenopathy, epiploic appendagitis shows

up as central areas of high attenuation and a hipper attenuated rim in proximity to the colon<sup>13,14</sup>.

Four deaths relating to the disease have also been reported in literature<sup>15</sup>. However torsion of an epiploic appendix is rarely diagnosed preoperatively, except abdominal computed tomography or ultra sound has been performed before operation. At the present time, a laparoscopic exploration of abdominal cavity will establish the correct diagnosis, and the treatment can be provided during the same procedure. Diagnostic laparoscopy is now considers an excellent diagnostic modality that offers an accurate assessment of this obscure pathology with the benefits of minimal risk and rapid recovery. Recently laparoscopic excision has been reported as method of choice from several centers<sup>1,5,8,14</sup>.

The Harmonic scalpel (Ultracision) is a very useful tool in laparoscopic surgery<sup>16–19</sup>, in this case for laparoscopic excision of the gangrenous epiploic appendix. With interrupted usage we have been able to prevent lateral thermal damage of tissue and thermal injuries of other organs below. Coagulation necrosis, at a standard output power, is greater following a longer application time. Tissue necrosis is also more extensive if the cutting time is

continuous compared with interrupted usage with equal duration of application. The minimization of lateral thermal injury is very important especially when operating near vital areas<sup>20,21</sup>.

## Conclusion

In conclusion, epiploic appendagitis is a surgical diagnosis with clinical features that may guide the surgeon to the right preoperative diagnosis. In patients with localized, sharp, acute abdominal pain which is not associated with other symptoms like nausea, vomiting, fever or typical abdominal laboratory values, the diagnosis of epiploic appendagitis should be considered as a rare differential diagnosis to sigmoid diverticulitis and appendicitis. Although infrequent until now, with the increase of primary abdominal CT scans and ultrasound, which have become standard diagnostic imaging tools, epiploic appendagitis will be diagnosed more frequently in the future.

We suggest that it if the appendix is find normal during appendectomy surgeon should looked for epiploic appendagitis which may closely mimic acute appendicitis.

## REFERENCES

- SAND M, GELOS M, BECHARA FG, SAND D, WIESE TH, STEINSTRASSER L, MANN B, BMC Surg, 7 (2007) 11. — 2. VINSON DR, J Emerg Med, 17 (1999) 827. — 3. AMMAR H, LOONEY SC, MALANI A, Lancet, 373 (2009) 2054. — 4. BASTIDAS JG, DANZY LE, BLACKWELL L, BOSTICK PJ, HAYDEN R, Am J Emerg Med, 26 (2008) 838. — 5. LEGOME EL, BELTON AL, MURRAY RE, RAO PM, NOVELLINE RA, J Emerg Med, 22 (2002) 9. — 6. LIEN WC, LAI TI, LIN GS, WANG HP, CHEN WJ, CHENG TY, Am J Emerg Med, 22 (2004); 507. — 7. PLATTSMILLS TF, BURG MD, J Emerg Med, 37 (2009) 308. — 8. TALUKDAR R, SAIKIA N, MAZUMDER S, GUPTA C, KHANNA S, CHAUDHURI D, BHULLAR SS, KUMAR A, Surg Today, 37 (2007) 150. — 9. AL-JABERI TM, GHARAIBEH KI, YAGHAN RJ, Annals of Saudi Medicine, 3–4 (2000) 211. — 10. DESAI HP, TRIPODI J, GOLD BM, BURAKOFF R, J Clin Gastroenterol, 16 (1993) 323. — 11. CHRISTIANAKIS E, PASCHALIDIS N, FILIPPOU G, SMALIS D, CHORTI M, RIZOS S, FILIPOU D, Cases J, 2 (2009) 8023. — 12. SAJJAD Z, SAJJAD N, FRIEDMAN M, ATLAS SA, Conn Med, 64 (2000) 655. — 13. JAIN M, KHANNA S, SEN B, TANTIA O, J Minim Access Surg, 4 (2008) 85. — 14. BANDYOPADHYAY SK, JAIN M, KHANNA S, SEN B, TANTIA O, J Min Access Surg, 3 (2007) 70. — 15. SHAMBLIN JR, PAYNE CL, SOILEAN MK, South Med J, 79 (1986) 374. — 16. PERKO Z, DRUŽIJANIĆ N, BILAN K, POGORELIĆ Z, KRALJEVIĆ D, JURIČIĆ J, SRŠEN D, KRNIĆ D, Coll Anthropol, 32 (2008) 187. — 17. PERKO Z, SRŠEN D, POGORELIĆ Z, DRUŽIJANIĆ N, KRALJEVIĆ D, JURIČIĆ J, Hepatogastroenterology, 55 (2008) 814. — 18. PERKO Z, BILAN K, POGORELIĆ Z, DRUŽIJANIĆ N, SRŠEN D, KRALJEVIĆ D, JURIČIĆ J, KRNIĆ D, Coll Anthropol, 32 (2008) 307. — 19. PERKO Z, BILAN K, VILOVIĆ K, DRUŽIJANIĆ N, KRALJEVIĆ D, JURIČIĆ J, KRNIĆ D, SRŠEN D, POGORELIĆ Z, Coll Anthropol, 30 (2006) 937. — 20. PERKO Z, POGORELIĆ Z, BILAN K, TOMIĆ S, VILOVIĆ K, KRNIĆ D, DRUŽIJANIĆ N, KRALJEVIĆ D, JURIČIĆ J, Surg Endosc, 20 (2006) 322. — 21. POGORELIĆ Z, PERKO Z, DRUŽIJANIĆ N, TOMIĆ S, MRKLIĆ I, Eur Surg Res, 43 (2009) 235.

Z. Pogorelić

University of Split, Split University Hospital Center, Department of Pediatric Surgery, Spinčićeva 1, 21000 Split, Croatia  
e-mail: zenon@vip.hr

## **TORZIJA APENDICES EPIPLOIKE OPONAŠALA JE KLINIČKU SLIKU AKUTNOG APENDICITISA**

### **S A Ž E T A K**

Pacijentica starosti 36 godina upućena je na Hitan kirurški prijam zbog bolova u desnoj ilijačnoj regiji, koji traju 24 sata, bez ostalih pridruženih gastrointestinalnih simptoma. Na fizikalnom pregledu pretila, afebrilna, sa vrlo snažnim bolovima i peritonejskim nadražajem u desnoj ilijačnoj regiji. Vrijednost leukocita bila je  $12,82 \times 10^9/L$ , a vrijednost C – reaktivnog proteina 15,13MG/DL. Indicirana je žurna laparoscopska operacija zbog kliničke sumnje na akutni apendicitis. Laparoscopska eksploracija trbušne šupljine pokazala je normalan crvuljak bez upalnih promjena i nerotičnu apendices epiploiku na cekumu. Učinjena je tipična laparoscopska apendektomija i laparoscopska resekcija nekrotične apendices epiploike. Pacijentica se vrlo brzo oporavila, te je otpuštena iz bolnice drugog poslijeoperacijskog dana. Patohistološki pregled resecirane apendices epiploike pokazao je gangrenu iste.