

Primary torsion of the greater omentum: an overlooked cause of acute abdomen

Mohammed S. Elsherbeny, Ahmed B. Arafa, Mohammed A. Gadallah and Mohammed S. Eldebaikay

Background/purpose Primary torsion of the greater omentum is an uncommon cause of acute abdomen in children. It was estimated to be found in 0.1% of cases operated for acute appendicitis and is almost impossible to be diagnosed preoperatively. Surgical excision of the infarcted omentum is the treatment of choice. In this study, we aimed to highlight the importance of suspecting primary omental torsion when operating upon a child presenting with a picture of acute appendicitis with normal appearing appendix intraoperatively.

Patients and methods Through the period from June 2009 to May 2016, medical records of patients who had definite diagnosis of primary omental torsion were retrospectively reviewed. Clinical presentations, laboratory findings, imaging studies results, intraoperative findings, and histopathological findings were reviewed.

Results During the specified time period, out of 1344 patients operated upon for acute appendicitis in our department, only four patients proved to have primary

torsion of the greater omentum. All the patients were obese with clinical picture mimicking acute appendicitis. The postoperative histopathological examination showed normal appendix and ischemic necrosis of the resected omental segment.

Conclusion Inspection of the greater omentum is essential when finding a normal appearing appendix in any case operated for suspicion of acute appendicitis. *Ann Pediatr Surg* 14:208–210 © 2018 Annals of Pediatric Surgery.

Annals of Pediatric Surgery 2018, 14:208–210

Keywords: acute abdomen, appendix, greater omentum, omental torsion

Department of Pediatric Surgery, Faculty of Medicine, Ain Shams University, Cairo, Egypt

Correspondence to Mohammed S. Elsherbeny, MD, Lotfy Elsayed Street, Abbassyyah, Cairo 11566, Egypt
Tel: + 20 100 365 0916; fax: + 20 2483 0833;
e-mail: mohamedsaid@med.asu.edu.eg

Received 19 April 2018 accepted 12 May 2018

Introduction

In contrast to secondary torsion of the greater omentum, which occur with intra-abdominal pathology like adhesions or tumors, primary omental torsion (POT) results from twisting of the greater omentum along its long axis causing vascular compromise, without any intra-abdominal pathology [1–3].

It was first described by Eitel in 1899, and since then only few case reports were published. The true incidence of this condition is underestimated, as it may be missed during appendectomy because of limited exposure [2].

The etiology of this rare condition is unknown, but some predisposing factors such as obesity, male sex, and precipitating factors such as sudden changes in body position, trauma, and excessive exercise have been suggested to play a role in its development [4,5].

In this series, we aimed to highlight the importance of considering this condition, when operating upon a child suspected to have acute appendicitis with normally appearing appendix intraoperatively.

Patients and methods

Through the period from June 2009 to May 2016, the medical records of children with primary torsion of the greater omentum were retrospectively reviewed. The data were retrieved from the filing system of our department. The review included clinical presentations, laboratory investigations, imaging studies results, and

histopathological examination findings. This work was approved by our ethics committee.

Results

During the specified time period, 1344 patients were operated upon for acute appendicitis in our department. Among those patients, only four (0.3%) patients had definite diagnosis of primary torsion of the greater omentum. They were three males and one female. Their age ranged between 9 and 14 years (mean: 12 years) and their weight ranged between 44 and 65 kg (mean: 57 kg) with a mean BMI of 31 kg/m².

All the patients presented with acute abdominal pain that started before admission by a period that ranged from 6 to 24 h (mean: 14 h). Two (50%) patients had nausea and vomiting (one patient had two attacks, the other had one attack). They were feverish on admission with a mean oral temperature of 38.1°C (range: 37.7–38.5°C). Localized abdominal tenderness was elicited at the right side of the abdomen in all patients but at sites higher than the McBurney's point. One patient had a history of trivial abdominal trauma during contact sport 24 h before admission. None of them had previous similar attacks, surgical interventions, or chronic illness.

Mean white blood cell count was $10.5 \times 10^9/l$ (range: $5.4\text{--}14.1 \times 10^9/l$). Pelvi-abdominal ultrasonography was performed in all patients but none of the examinations gave the correct diagnosis of POT. Three ultrasonic examinations showed no abnormality and one suggested acute

appendicitis by the probe tenderness sign on the right iliac fossa.

All the patients were explored (two by laparoscopy and two by laparotomy); the appendix was normal and the omentum was twisted around itself with infarction of a part of it. The appendix and the infarcted omentum were excised and sent for histopathological examination. The histopathological examination showed normal appendix and omental infarction (Fig. 1).

Table 1 summarizes the characteristics of the patients involved in the study.

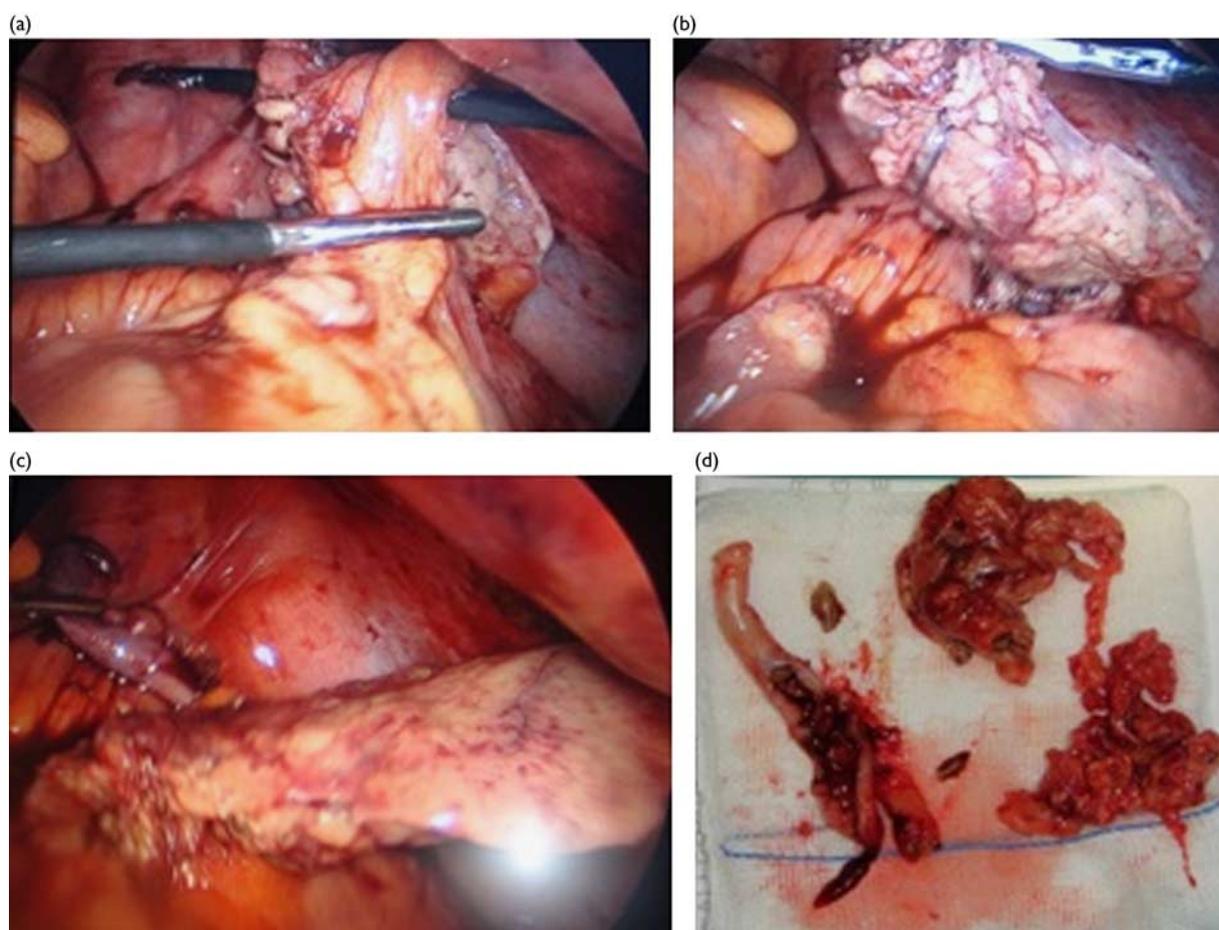
Discussion

Primary torsion of the greater omentum is an uncommon cause of acute abdomen in children. It is estimated

to be found in 0.1% of children operated upon for acute appendicitis [1]. The clinical presentation is similar to that of acute appendicitis; however, patients with POT tend to have little or no gastrointestinal symptoms with mild or no elevation of the white blood cells count [2]. In our series, two patients had nausea and vomiting and the white blood cell count was within the normal range in two patients and mildly elevated in the other two patients.

Obesity has been suggested to be a predisposing factor for POT; the increased fat deposition with its uneven distribution acts as lead point for omental torsion [6]. The predominancy of this condition on the right side of the omentum may be explained by its greater size and increased mobility compared with the left side [7,8]. Other predisposing factors like bifid omentum, accessory

Fig. 1



(a) Dissection of the omental mass from anterior abdominal wall. (b) After full mobilization of the omental mass. (c) Omental mass and the normal appendix. (d) The resected specimen and the normal opened appendix.

Table 1 Characteristics of the patients involved in the study

Age (years)	BMI (kg/m ²)	GIT symptoms	Open vs. laparoscopy	Site of the omental mass on exploration	Length of hospital stay (days)
9	28.9	Yes	Open	Right hypochondrial and umbilical	3
13	33.2	Yes	Laparoscopy	Right lumbar	2
14	30.8	No	Open	Right hypochondrial	3
10	31.1	No	Laparoscopy	Right hypochondrial	2

GIT, gastrointestinal.

omentum, and narrow omental pedicle have been also incriminated [9]. Precipitating factors like trauma, sudden changes in position, and heavy exercise can play a role in its development in a predisposed child [10]. In our series, all the patients were obese and one of them had a history of trivial abdominal trauma before the attack.

Ultrasonography can aid in the diagnosis of POT. The characteristic finding is an oval hyperechoic mass adherent to the abdominal wall surrounded by a hypoechoic rim [11,12]. However, the ultrasonography is operator dependent and sometimes it cannot detect it. In our series, none of our patients was diagnosed preoperatively by the ultrasound.

Surgical excision of the infarcted omentum is the treatment of choice. Laparoscopy allowed better visualization of the peritoneal cavity and hence better chance to diagnose it and also allowed surgical excision with better cosmetic results [13–15]. In our series, two patients underwent resection by laparoscopy, while in the other two patients, laparoscopy was not available, so open excision was done.

There is a controversy about performing an appendectomy in the same setting, while excising the infarcted omentum. Those who advocated doing appendectomy argued that this avoided the future confusion with appendicitis which was called ‘prophylactic appendectomy’ [6]. However, the intraoperative finding of a POT and a normally appearing appendix in a child presenting with acute abdomen explained the cause of his abdominal pain. So, most authors recommended preserving the normal appendix and doing only excision of the infarcted omentum in this case [8]. In our series, we did appendectomy in the four cases, as we were not sure that omental torsion was the primary intra-abdominal pathology causing acute abdomen. However, the postoperative histopathological examination confirmed the diagnosis, which may change our decision in the future cases.

However, the study is limited by its retrospective nature and the small number of patients included. So, further

studies with a large number of patients are required to give more insight into this rare cause of acute abdomen.

Conclusion

Primary torsion of the greater omentum should be searched for when finding a normally appearing appendix, while operating upon a child suspected to have acute appendicitis.

Conflicts of interest

There are no conflicts of interest.

References

- Georgios M, Evangelia L, Nikolaos B, Evi V, Christopoulos-Geroulanos G. Primary omental torsion in children: ten-year experience. *Pediatr Surg Int* 2007; **23**:879–882.
- Mallick M, Al-Bassam A. Primary omental torsion in children. The predisposing factors and role of laparoscopy in diagnosis and treatment. *Saudi Med J* 2006; **27**:194–197.
- Mohamed A, Mohamed Y, Harera I. Primary torsion of the omentum: an intraoperative surprise, case report. *Int J Surg* 2010; **26**:2.
- Joshi S, Cuthbert GA, Kerwat R. Omental torsion, a rare cause of acute abdomen. *BMJ Case Rep* 2016; **2016**:bcr2015213118.
- Theriot JA, Sayat J, Franco S, Buchino JJ. Childhood obesity: a risk factor for omental torsion. *Pediatrics* 2003; **112**:e460.
- Occhionorelli S, Zese M, Cappellari L, Stano R, Vasquez G. Acute abdomen due to primary omental torsion and infarction. *Case Rep Surg* 2014; **2014**:208382.
- Papageorgiou I, Hatzigeorgiadis A, Papadopoulos J, Andreou K, Blouhos K. Always think about omental torsion when the appendix looks normal. *Am J Case Rep* 2010; **11**:138–141.
- Tsironis A, Zikos N, Bali C, Pappas-Gogos G, Koulas S, Katsamakis N. Acute abdomen due to primary omental torsion: case report. *J Emerg Med* 2013; **44**:e45–e48.
- Ali SD, Sheeraz-ur-Rahman S. Common presentation uncommon diagnosis primary omental torsion. *J Pak Med Assoc* 2013; **63**:117–119.
- Chen CD, Chen XM, Wu SC. A child with the rare diagnosis of acute appendicitis and omental torsion. *HK J Paediatr* 2012; **17**:254–257.
- Madha ES, Kane TD, Manole MD. Primary omental torsion in a pediatric patient: case report and review of the literature. *Pediatr Emerg Care* 2018; **34**:e32–e34.
- Khalid K, Somuah TS, Aziz E, Mohamed R, Youssef B. Primary omental torsion in children: case report. *Pan Afr Med J* 2013; **14**:57.
- Bagul M, Mehra R, Kumar S, Sharma S. Primary greater omental torsion: pre-operative CT and intraoperative findings correlation. *J Case Rep* 2016; **6**:306–309.
- Zanchi C, Salierno P, Bellomo R. Primary acute omental torsion in an overweight girl. *J Pediatr* 2012; **160**:525.
- Valioulis I, Tzallas D, Kallintzis N. Primary torsion of the greater omentum in children: a neglected cause of acute abdomen? *Eur J Pediatr Surg* 2003; **13**:341–343.