

Primary Torsion of the Greater Omentum: Report of Two Cases and Review of the Literature

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Citation

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Abstract

Torsion of the greater omentum is an uncommon cause of acute abdominal pain that mainly affects adults in their fourth or fifth decade. It can be primary or secondary due to rotation of a mobile omental segment around a pivotal point or a pathologic intra-abdominal process (e.g. inguinal hernia). The clinical features are not specific for this condition and often resemble acute appendicitis or acute cholecystitis. Laboratory and imaging findings are also of little diagnostic value. The diagnosis is usually made at laparotomy. Treatment of choice is resection of the involved omental segment along with appendectomy for the prevention of future diagnostic problems. We report two cases of primary omental torsion, followed by a review of the diagnostic and therapeutic implications of this condition.

INTRODUCTION

Torsion of the greater omentum is an uncommon cause of acute abdominal pain that mainly affects adults in their fourth or fifth decade. The clinical features are not specific for this condition and often resemble acute appendicitis or acute cholecystitis. The diagnosis is usually made at laparotomy. We report two cases of primary omental torsion, followed by a review of the diagnostic and therapeutic implications of this condition.

CASE 1

A 30-year-old male athlete was admitted in our department with a 7-day history of right-sided, abdominal pain that was not associated with fever, anorexia or vomiting. The pain had started as nonspecific abdominal disturbance and was increasing in severity. Two days before, he was admitted for the first time due to severe abdominal pain that was increasing in standing position and relieved in supine position. At that time, the pain was attributed to abdominal wall trauma and possible subsequent hematoma, due to previous heavy abdominal muscle exercise. He was discharged with instructions for resting and prescription for NSAIDs, which resulted in transient remission of his symptoms. On the day of his second admission, the pain was extremely severe (the patient reported transient loss of consciousness) and was not affected by his body position. On physical examination, the patient had tenderness, guarding and rebound tenderness in the right side of his

abdomen, but no mass was palpable. Laboratory findings were within normal ranges, except for mild leukocytosis ($12500/\text{mm}^3$). Due to the inconsistency between clinical presentation and laboratory findings, an ultrasound examination was performed, which showed an encysted infusion in the right abdomen, beneath the rectus abdominis fascia (figure 1). A laparotomy was performed, through a right paramedian incision. A small amount of serosanguinous fluid was found, in association with a large (10cm x 6cm x 1.5cm) tongue-like projection originating from the greater omentum, which was twisted several times (figure 2). The mass was excised and an appendectomy was also performed. No other intra-abdominal pathology was found. Histological examination of the omental segment showed focal hemorrhage, vascular congestion and nonspecific inflammatory infiltration. The patient recovered uneventfully and was discharged on the fourth postoperative day.

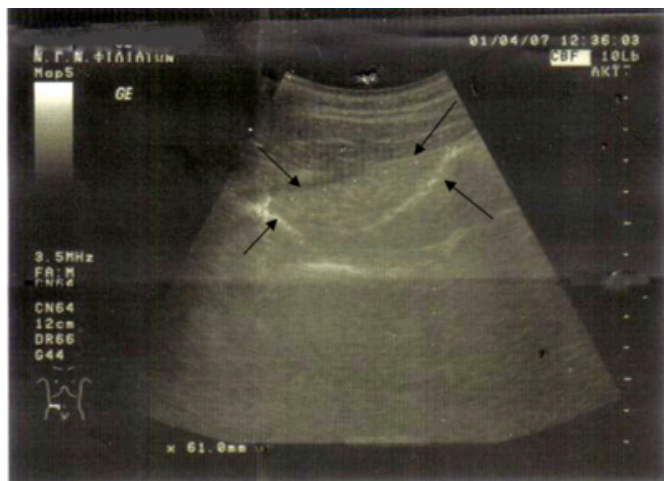
CASE 2

A 43-year-old female was admitted in our department with a 4-day history of nonspecific abdominal pain. The pain was more severe in the right subcostal area and was associated with fever (37.7°C). The patient reported deterioration of symptoms in standing position and with coughing, and remission in supine position. Her past medical history was unremarkable. On physical examination, the patient had tenderness, guarding and rebound tenderness in the right

subcostal area, associated with decreased bowel sounds. Laboratory findings were normal except for leukocytosis ($13.700/\text{mm}^3$). The working diagnosis was acute cholecystitis, so an ultrasound examination was carried out, which showed a hyperechoic soft tissue mass (5 x 6cm) lying beside the normal, stone-free gallbladder. A diagnostic laparoscopy was performed using 3 trocars (umbilical, subxiphoid and right upper quadrant). The abdominal exploration revealed a tongue-like projection of the greater omentum which was twisted around its long axis leading to infarction. Additional findings were the presence of a small amount of serosanguinous fluid in the right paracolic gutter, along with a normal appendix. The twisted part of the omentum was resected using bipolar forceps and removed through the subxiphoid trocar. Histological examination showed vascular congestion and necrosis of the omental segment. The patient recovered uneventfully and was discharged on the third postoperative day.

Figure 1

Figure 1: Encysted infusion beneath the rectus abdominis fascia (arrows)



DISCUSSION

Omental torsion is a rare cause of acute abdomen that was first described by Eitel in 1899 (1). Today, more than 300 cases of this condition have been described in the published literature. It usually affects adults between 30 to 50 years (2) and children between 9 to 16 years of age (3). The male to female ratio is approximately 1.5 : 1 (4).

Omental torsion occurs when omentum twists around its long axis, causing venous obstruction, edema and vascular compromise (5). It can be primary (idiopathic) or secondary (6). Primary omental torsion, which counts for one third of cases (6), is due to a rotation of a mobile omentum segment

around a pivotal point (7). The etiology of this primary form still remains unclear but several factors have been implicated in its pathogenesis (8). Predisposing factors of primary torsion include anatomical malformations of the omentum such as bifid omentum or tongue-like projections, local variations in omental fat distribution as in obesity and vascular abnormalities of the omentum (3,6,9,10). Precipitating factors include trauma, hyperperistalsis due to heavy meals and increased intra-abdominal pressure resulting from exercise or coughing (3,6,11,12). Primary omental torsions are usually located in the right side of the abdomen. In approximately 90% of cases the omentum is found twisted around the distal right epiploic artery, which is due to the fact that the right side of the omentum is longer and thus more mobile than the left side (13,14). The secondary form is more common (6) and it occurs when the free omental end is attached to a pathologic intra-abdominal process (15). Lesions associated with secondary omental torsion may be omental (tumors, cysts) (16,17), parietal (inguinal hernias, adhesions) (18,19) or visceral (appendicitis, cholecystitis) (20,21).

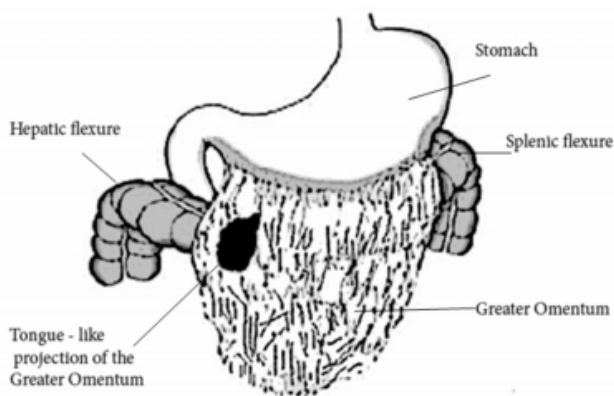
The clinical presentation of omental torsion is nonspecific and largely depends on the degree and duration of torsion. The cardinal feature of omental torsion is abdominal pain of sudden onset and short duration, which is constant, non-radiating and gradually increasing in severity. The pain is usually located in the right side of the abdomen with occasional prior acute presentations of nonspecific pain, suggestive of recurrent torsion (22). Another feature that we observed in both our cases is the increasing of pain in standing position and remission in supine position, at least in the early stages. Anorexia, nausea and vomiting are present in less than 50% of cases, associated at variable extents, with mild fever, bowel disorders, dysuria and leukocytosis (12). The physical examination reveals right lower quadrant tenderness, which is frequently accompanied by guarding and rebound tenderness. If the involved segment of the omentum is sufficiently large, a mass may be palpable in up to one third of patients (12,23,24,25).

Imaging evaluation of primary omental torsion includes ultrasonography and computer tomography, as plain films are of little diagnostic help. The cardinal findings on ultrasound examination are an ovoid hyperechoic soft-tissue mass adhering to the anterior abdominal wall with hypoechoic rim and non-compressibility of the fat (2,3,26). According to our experience, ultrasound scans were suggestive of intra-abdominal pathology but their diagnostic

specificity was low. The typical CT findings include a streaking or “whirling pattern” of inflammatory tissue, potentially with a fluid cavity based on the degree of necrosis present (27). A basic advantage of CT versus an ultrasound scan is the reliability of identifying the mass in the characteristic location between the anterior abdominal wall and the colon (26). Preoperative differential diagnosis should include all disorders which give rise to acute abdominal pain in the right side of the abdomen, such as cholecystitis, appendicitis, perforated peptic ulcer, intestinal obstruction, Meckel's diverticulum, abdominal wall hematoma, mesenteric adenitis, torsion of accessory spleen, ovarian cyst torsion, ectopic pregnancy and salpingitis.

Figure 2

Figure 2: Schematic representation of twisted tongue-like projection of the greater omentum



Physical findings and laboratory examinations are usually not sufficient to establish a preoperative diagnosis of omental torsion, so most of the patients are submitted to laparotomy for “acute appendicitis” or acute abdomen of poorly defined origin. The intraoperative findings that should raise the suspicion for omental torsion are the presence of free serosanguinous fluid along with the absence of other intra-abdominal pathology (normal appendix, absence of Meckel's diverticulum) (15,28). Although there are reports that support the conservative treatment of omental torsion (29), most authors agree, that treatment of choice is resection of the involved segment of the omentum along with appendectomy, for the prevention of future differential diagnostic problems (29,30,31,32). Excision of the twisted part of the omentum offers immediate relief of symptoms and reduction of the possibility of complications such as adhesions, bowel obstruction and abscess formation (12,23,24,33,34). More recently laparoscopic treatment is reported to be an ideal approach in the management of primary omental torsion. We agree that laparoscopy is a

useful method for both diagnostic and therapeutic purposes (resection of affected omentum) (30,35,36,37).

CONCLUSION

Primary omental torsion is a rare cause of acute abdomen, which affects both children and adults. The clinical presentation, laboratory findings and imaging evaluation are often non-specific. The differential diagnosis includes appendicitis, cholecystitis, Meckel's diverticulum, twisted ovarian cyst, abdominal wall hematoma and a variety of other entities. The diagnosis is usually made at laparotomy. Nowadays, laparoscopic approach seems to be the most safe and effective tool for diagnosis and final treatment.

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References

1. Eitel GG. Rare omental torsion. NY Med Rec 1899; 55:715-716.
2. Bachar GN. Sonographic diagnosis of right segmental omental infarction. J Clin Ultrasound 2005; 33:76-79.
3. Theriot JA. Childhood obesity: a risk factor for omental torsion. Pediatrics 2003; 112(6 Pt 1):e460.
4. Paroz A. Idiopathic segmental infarction of the greater omentum; a cause of acute abdomen. J Gastrointest Surg 2003; 7:805-808.
5. Puberbach WJ. Torsion of omentum. NY State J Med 1949; 49:1571.
6. Barbier C. Diagnostic imaging of idiopathic segmental infarct of the greater omentum. Diagnostic and physiopathologic considerations. J Radiol 1998; 79:1485.
7. Jeganathan R, Epanomeritakis E, Diamond T. Primary torsion of the omentum. Ulster Med J. 2002; 71:76-77.
8. Leitner MJ, Jordan CG, Spinner MH, Reese EC. Torsion, infarction and hemorrhage of the omentum as a cause of acute abdominal distress. Ann Surg 1952; 135:103-10.
9. Young TH, Lee HS, Tang HS. Primary torsion of the greater omentum. Int Surg. 2004; 89:72-75.
10. al-Husaini H, Onime A, Oluwole SF. Primary torsion of the greater omentum. J Natl Med Assoc 2000; 92:306-308.
11. Nihei Z, Kojima K, Uehara K, Sawai S, Kakihana M, Hirayama R, et al. Omental bleeding with spontaneously derotated torsion - a case report. Jpn J Surg 1991; 21:700-2.
12. Mainzer RA, Simoes A. Primary idiopathic torsion of the omentum. Arch Surg 1964; 88:974-83.
13. Sweeney MJ, Blestel GA, Ancalmo N. Primary torsion of greater omentum. A rare cause of abdominal pain in children. JAMA 1983; 249:3073.
14. Rich RH, Filler RM. Segmental infarction of the greater omentum: a cause of acute abdomen in children. Can J Surg 1983; 26:241-243.
15. Karayannakis A, Polychronidis A, Chatzigianni E, Simopoulos C. Primary torsion of the greater omentum: report of a case. Surg Today 2002; 32:913-915.
16. Furuhashi M, Katsumata Y, Oda H, Imai N. Cystic teratoma of the greater omentum: A case report and review of the literature. J Obstet Gynaecol Res 1997; 23:359-363.
17. Tsutsumi H, Ohwada S, Takeyoshi I, Izumi M, Ogawa T

Fukusato T, et al. Primary omental liposarcoma presenting with torsion: A case report. *Hepatogastroenterology* 1999; 46:2110-2112.

18. Xavier S, John P: Torsion of the greater omentum with inguinal hernia. *Indian J Gastroenterol* 2003; 22:194-196.

19. Schwartzman GJ, Jacobs JE, Birnbaum BA: Omental infarction as a delayed complication of abdominal surgery. *Clin Imaging* 2001; 25:341-343.

20. Natarajan A, Rozario A: Omental torsion with acute appendicitis: an interesting association. *Trop Doct* 2002; 32:243-244.

21. Opushnev VA, Nokhrin SP: [Combined torsion of the greater omentum with phlegmonous inflammation of the "floating" gallbladder]. *Vestn Khir Im II Grek* 1991; 147:46-47.

22. Caprino P, Prete FP, Alfieri S, Doglietto GB. Acute abdomen for omental volvulus. *Am J Surg* 2004; 187:268-269.

23. Brady SC, Kliman MR. Torsion of the greater omentum or appendices epiploicae. *Can J Surg* 1979; 22:79-82.

24. Adams JT. Primary torsion of the omentum. *Am J Surg* 1973; 126:102-5.

25. Saraç, AM, Yeg?en C, Aktan AÖ, Yalin R. Primary torsion of the omentum mimicking acute appendicitis: report of a case. *Surg Today* 1997; 27:251-3.

26. Grattan-Smith JD, Blews DE, Brand T. Omental infarction in pediatric patients: sonographic and CT findings. *AJR* 2002; 178:1537-1543.

27. Naffa L, Shabb N, Haddad M. CT findings of omental torsion and infarction: report of a case and review of the literature. *Clin Imaging* 2003; 27:116-118.

28. Cao Wengang, Zhang Jinzhe. Primary omental torsion in a 12-year old boy. *CMJ* 2001; 114:202-203.

29. Perello MJ, Albasini AJL, Soria Aledo V. Omental torsion: imaging techniques can prevent unnecessary surgical interventions. *Gastroenterol Hepatol* 2002; 25:493-496.

30. Goti F, Hollman R, Stieger R. Idiopathic segmental infarction of the greater omentum successfully treated by laparoscopy: report of a case. *Surg Today* 2000; 30:451-455.

31. Loh MH, Chui HC, Yap TL. Omental infarction - a mimicker of acute appendicitis. *J Pediatr Surg* 2005; 40:1224-1226.

32. Helmrath MA, Dorfman SR, Minifee PK. Right lower quadrant pain in children caused by omental infarction. *Am J Surg* 2001; 182:729-732.

33. Balthazar EJ, Lefkowitz RA. Left-sided omental infarction with associated omental abscess: CT diagnosis. *J Comput Assist Tomogr* 1993; 17:379-385.

34. Vertuno LL, Dan JR, Wood W. Segmental infarction of the omentum: a cause of semi-acute abdomen. *Am J Gastroenterol* 1980; 74:443-446.

35. Gassner PE, Cox MR, Cregan PC. Torsion of the omentum: diagnosis and resection at laparoscopy. *Aust N Z J Surg* 1999; 69:466-7.

36. Sanchez J, Rosado R, Ramirez D, Medina P, Mezquita S, Gallardo A. Torsion of the greater omentum: Treatment by laparoscopy. *Surg Laparosc Endosc Percutan Tech* 2002; 12:443-445.

37. Mallick MS, Al-Bassam AA. Primary omental torsion in children. The predisposing factors and role of laparoscopy in diagnosis and treatment. *Saudi Med J* 2006; 27:194-197.

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