

Primary Omental Torsion Mimics Acute Appendicitis in Children - A Case Series & Review of Literature

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ABSTRACT

BACKGROUND

Paediatric acute abdomen is challenging to tackle due to subtle variations in signs and symptoms. Acute appendicitis is one of the common acute surgical conditions encountered by paediatric surgeons. Primary omental torsion is rare & can mimic clinical features of acute appendicitis. We wanted to study primary omental torsion in children.

METHODS

Laparoscopy used as surgical tool to diagnose and treat this condition. Available data mentioning seven diagnosed cases out of 748 cases of acute appendicitis were retrospectively collected from operative notes from the period 2013 - 2019, from a single tertiary care hospital.

RESULTS

Majority of cases were referred to surgical emergency wing, with a mean age of 9.3 years. Most of them were male, and pre-obese. All cases could not be diagnosed preoperatively by ultrasonography except one reported as greater omentum thickened & adherent to right iliac parietes. On performing diagnostic laparoscopy, haemoperitoneum was the key finding in six cases with infarcted omentum in all cases. Laparoscopic omentectomy with appendectomy and peritoneal toiletting was done in all cases. Recovery and post-operative period were uneventful.

CONCLUSIONS

Primary omental torsion might get missed as a differential to acute appendicitis & haemoperitoneum should be considered as a tell-tale sign of this condition.

KEYWORDS

Appendix, Haemoperitoneum, Omentitis, Infarcted Omentum, Pre-Obese

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BACKGROUND

Acute abdomen in paediatric age group is a worrisome scenario for both parents and the treating doctor. These children are mostly diagnosed with some evident pathology either by first treating physician or paediatric surgeon. Primary omental torsion is an infrequent cause and its symptoms are non-specific, often presenting with pain at the right iliac fossa as the only symptom. Eitel first described primary omental torsion in 1899; since then, only about 300 cases have been reported.¹ Primary omental torsion and infarction results from twisting of the omentum along its long axis vessel compromising its own vascularity.² It often mimics other acute pathologies and is very difficult to diagnose preoperatively,³ which can lead to the deterioration of the patient. Omental torsion can be primary or secondary,⁴ according to its correlation to pre-existing abdominal pathologies such as cysts, tumours, hernias or inflammation.

This article evaluates cases of primary omental torsion charted on discharge sheet, retrospectively collected among all those admitted with provisional diagnosis often pointing towards acute appendicitis, but during laparoscopy, primary omental torsion was found. Presentation, approach, diagnosis and outcome of all cases were noted.

METHODS

On retrospective analysis of 748 cases of acute abdomen in children with a provisional diagnosis of acute appendicitis, we encountered seven cases of primary omental torsion from July 2013 to June 2019. All seven cases of omental torsion were referred cases from Department of Paediatrics to paediatric surgical emergency ward with working diagnosis of acute appendicitis. History was collected about age, sex, onset of symptoms and its duration. Family history, socio-economic status and diet history were added to the preliminary history taking. Trauma history was an important history which was asked mandatorily in all patients. Parent or child was asked to describe pain during onset and its due course to another quadrant on abdomen. Nature of pain and aggravating factors were noted. Vomiting was also a feature found in our study population and history included queries for its content and amount with total number of episodes. Its relation to food intake and projectile nature. Other symptoms like anorexia, fever were duly noted. On examination, general condition & vitals were assessed along with weight and height. Subsequently, BMI (Body Mass Index) was calculated (weight in kilograms divided by height in meters squared) to categorize child as pre-obese or obese. Abdominal girth was measured in all cases. Clinical signs like guarding, tenderness (McBurney's point) with or without parietal wall discoloration assessed. Mass abdomen if felt was noted in examination findings. Clinical notes of adequate resuscitation including intravenous fluids, analgesics & broad-spectrum antibiotics administration were confirmed from referral documents collected from department of paediatrics. Ultrasonography reports were

reviewed and fresh routine investigation e.g. complete blood count, ESR, urine analysis, serum urea, creatinine, electrolytes, amylase and lipase were done in all cases. We had planned for diagnostic laparoscopy under general anaesthesia after explaining about procedure, results and further prognosis in their own language. A signed written consent in prescribed format were signed and kept following proper counseling of parents. All laparoscopic findings and definitive operative steps done were noted in operative document. Recorded endoscopic video of operative procedure was preserved in each case for review and reference. Laparoscopy was the chief mode of intervention proposed in all of our cases and conversion to laparotomy was kept as an alternative. Three port laparoscopic approach was done in all cases following initial inspection of all quadrants of abdominal cavity by optical port. Peritoneal lavage was an important step done in all cases along with specimen delivery through umbilical port with or without using endobag. In our cases we used latex gloves as endopouch for specimen removal. All specimens were sent for histopathological examination. Soft diet was started after 24 to 48 hours of surgery. Discharge certificate was issued once child started taking orally, was ambulatory without any specific complaints, follow-up was advised after two weeks post-operatively. Port sites were inspected for local infection on follow up. General examination taking history of recurrent episodes of pain or vomiting was noted. History of diet intake, bowel & bladder habit was also noted. All relevant data were tabulated with mean or percentage calculation using SPSS statistics for Windows, Version 17.0. Chicago: SPSS Inc.

RESULTS

This case series consists of seven admitted cases presenting as acute presenting as acute abdomen from July 2013 to June 2019 with a final diagnosis of primary omental torsion or omental infarction. All cases were referred cases from Department of Paediatrics to paediatric surgical emergency ward with working diagnosis of acute appendicitis. Mean age at presentation was 9.3 years and male to female ratio of 5 : 2. All patients had good socioeconomic status with calculated BMI in overweight range. Presenting complaints were pain in majority of cases (85.7 %) along with vomiting (28.6 %). High grade fever was not a significant complaint in most of cases. 6 out of seven cases (85.7 %) presented with McBurney's point tenderness with or without associated pain. History of old trauma more than 72 hours, mostly trivial was noted in two of seven cases (28.6 %). One case was decided late to be intervened due to parietal cellulitis and pain. All cases were in emergency ward usually having ultrasonogram accessibility only.

Stabilization with intravenous fluids and analgesics were done followed by sonogram in the paediatrics casualty wing. Laboratory test results showed slight leukocytosis, haemoglobin in normal range, normal counts of platelets, serum amylase was raised in four out of seven cases with normal lipase value in all cases.

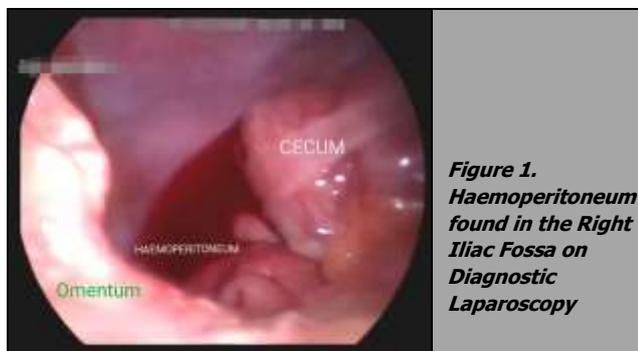


Figure 1.
Haemoperitoneum found in the Right Iliac Fossa on Diagnostic Laparoscopy

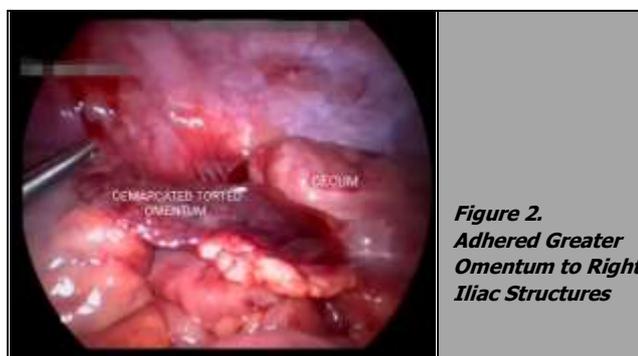


Figure 2.
Adhered Greater Omentum to Right Iliac Structures

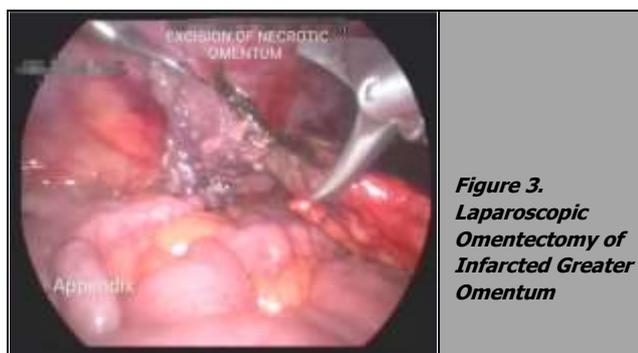


Figure 3.
Laparoscopic Omentectomy of Infarcted Greater Omentum

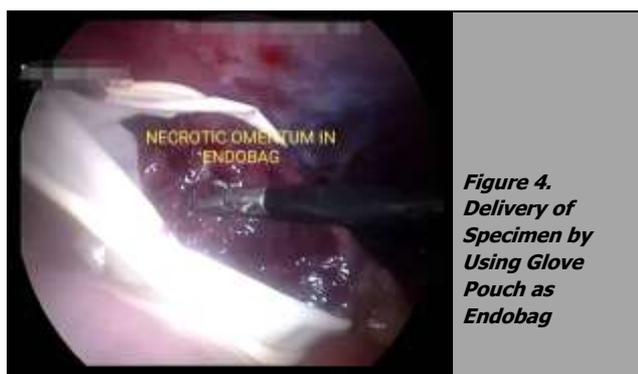


Figure 4.
Delivery of Specimen by Using Glove Pouch as Endobag

A general urine analysis showed no alterations. On optical port placement in order to inspect abdomen, 6 out of seven cases had peritoneal clots or haemorrhagic fluid [Figure 1]. Confusion regarding injury to vitals while placing first port was ascertained inspecting all possible sites in our first encountered case. To our luck, we could diagnose infarcted greater omentum in two out of seven cases by its bluish to dark brown appearance, located in right iliac region [Figure 2]. Rest all cases were decided to progress for a classical laparoscopic appendectomy. Rest of the port placed, and appendix was identified after dissection. On inspecting vermiform appendix, right iliac fossa parietal wall

adhered to greater omental projection and surprisingly with normal appearing appendix in these cases. The greater omentum was adhered to the right hypochondrium or iliac region of the abdominal wall anteriorly, and there was a haemorrhagic patch on the central part of the omental tissue; the distal part adherent to the abdominal wall appeared necrotic, and haemorrhagic fluid was present in the pelvis. Omental mass was removed securing vascular pedicle by using vessel sealer or suture ligation [Figure 3]. Specimen was delivered through umbilical port in an endobag (latex gloves) in all cases [Figure 4]. Appendectomy was done in all cases along with above intervention. Specimens were sent for histopathology.

Postoperatively, dramatic improvement was noted in almost all cases except persistent abdominal pain in one case, which was managed by antispasmodic and PPI. Orally allowed on post-operative second day. All patients were discharged by 3rd to 5th postoperative day. Follow up after two weeks was uneventful with healthy port site surgical wound. Histology report confirmed omental torsion with extensive haemorrhagic necrosis, accompanied by inflammatory infiltration (fibrinous exudates, marked fibrotic reaction). Appendix showed early acute appendicitis which was limited to serosal involvement secondary to the intra-abdominal inflammation.

Sl. No.	Age	Sex	Pain (Duration in Hours)	Vomiting	Fever	McBurney's Point Tenderness	Past History of Trauma	Past History of Similar Episode	SE Status	Calculated BMI
1	8.0	M	Yes (24)	No	No	Yes	No	No	High	26.2
2	6.1	M	Yes (14)	Yes	Yes	Yes	No	No	Mid	27.0
3	12.5	F	Yes (18)	Yes	No	Yes	Yes	No	High	26.8
4	11.0	M	No	No	No	Yes	No	No	Mid	28.8
5	7.5	M	Yes (8)	No	No	No	No	No	High	25.0
6	9.0	F	Yes (12)	No	No	Yes	No	No	High	26.3
7	11.0	M	Yes (36)	No	No	Yes	Yes	No	High	28.0

Table 1. Patient's History with Sign & Symptoms

DISCUSSION

Primary omental torsion is differentiated from secondary omental torsion by unipolarity. Proximal segment is fixed, and other end is free while in secondary torsion, the distal end is fixed to adhesions or some pathological condition.⁵ Predisposing factors for primary torsion enlisted are presence of tongue like projections, bifid omentum, anomalous vascular blood supply, irregular omental pedicle mostly in obese patients. Torsion of the omentum is a condition wherein the omentum twists along its long axis to such an extent that its vascularity is compromised.⁶ Kimber et al reviewed 8000 case and concluded primary omental torsion incidence is one out of every 600 operations for classical appendectomy but with a normal appendix. We had around 748 cases of appendectomy done in same period of the study.⁷ Particularly, children above the age of four years were affected, probably, due to the increase in omental fat deposition as the child grows.⁸ In adult population, 66 % of

these cases mimic appendicitis, and 22 % cholecystitis.⁹ With more incidence in the age group between 30 and 50 years and the male to female ratio is 2 : 1.¹⁰ Boys were affected more in comparison to girls, even in our case series.¹¹ Obesity was noted as important predisposing factor.¹²

Pathogenesis of primary omental torsion as described by Jain P et al is redundancy of the omental veins as compared to the arteries which when twisted causes venous engorgement and rupture of a dependent vein, precipitating thrombosis⁶ and progressively infarction. Intraoperatively, haemoperitoneum was noted in our cases which could be well correlated.

Sometimes, ultrasound might pick up echogenic mass in the right lumbar or iliac region, anterior to the colon, aggregate of abnormal fatty tissue. CT scan reported fat stranding anterior to the ascending colon in right lumbar region with normal looking appendix.⁶ The "whirlpool sign" is described as a cloudy mass of fat with concentric lines of fat, with torsion of the blood vessels inside the greater omentum. These turn around a central vascular line.¹³

Better option was always proceeding for laparoscopy that helped for both diagnosis and the treatment.¹¹ In our cases, all were referred to emergency department with a surgical diagnosis, which led us to proceed for DL (Diagnostic Laparoscopy) followed by omental excision.¹⁴ Surgical management of primary omental torsion includes resection of the involved omentum by using energy source or intracorporeal knot securing vessels of omental mass. Tsironis et al stated early diagnosis may lead to conservative management, although surgery has been recommended for avoiding severe complications such as sepsis and intra-abdominal abscess formation¹⁵ which holds true in all of our cases as one of our case progressed towards parietal cellulitis. Literature suggest that, if the omentum was not excised it might become atrophic and fibrotic and, on rare occasions, the pedicle even autoamputates leading to automatic clinical regression.¹⁶

CONCLUSIONS

Primary omental torsion is an entity that differs from acute appendicular pathology by subtle clinical points. In cases, where imaging gets equivocal, laparoscopy could be used as a diagnostic and therapeutic tool. In a case of negative laparoscopy for acute appendicitis or Meckel's diverticulitis with normal gallbladder or ovaries intraoperatively, primary omental torsion is to be sought in paediatric population in the presence of haemorrhagic fluid in the peritoneal cavity. So, authors recommend use of laparoscopic approach in all cases of acute appendicitis as primary omental torsion could be missed even in open appendectomy.

Data sharing statement provided by the authors is available with the full text of this article at jebmh.com.

Financial or other competing interests: None.

Disclosure forms provided by the authors are available with the full text of this article at jebmh.com.

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient (s) has / have given his / her / their consent for his / her / their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published, and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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