

Primary omental torsion in children

The pre-disposing factors and role of laparoscopy in diagnosis and treatment

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ABSTRACT

Objectives: To determine the predisposing factors and to evaluate the role of laparoscopy in the diagnosis and management of primary omental torsion in children.

Methods: We retrospectively reviewed the clinical records of all children treated for primary omental torsion from August 1999 to December 2004 at King Khalid University Hospital, Riyadh, Saudi Arabia. Demographic data, clinical presentation, diagnostic and therapeutic modalities were evaluated. Follow-up was also obtained.

Results: Six children were included in the study. Their age ranging between 9-12 years (average 10.4 years). All of them presented with right lower quadrant (RLQ) pain mimicking appendicitis. The duration of symptoms varied from 3-5 days prior to presentation. Localized RLQ tenderness with guarding was demonstrated in all patients. All children were noted to be obese. Only one patient had low grade fever and nausea. None of the patients had an elevated white blood cell count. Laparoscopic exploration was

carried out in all cases for possible appendicitis. Appendix was found to be normal and torqued omentum was clearly seen in all cases. The infarcted omentum was removed laparoscopically; all patients had uneventful recovery and were discharged on second postoperative day. Pathological examination showed necrotic infarcted omentum with no other abnormalities. Follow-up documented complete resolution of the patient's symptoms.

Conclusion: Clinical presentation of primary omental torsion mimics that of acute appendicitis. Its diagnosis is usually difficult and almost impossible pre-operatively. Obesity, paucity of gastrointestinal symptoms and relatively long duration of symptoms should increase the index of suspicion. We believe that the laparoscopic approach is an excellent tool for the diagnosis and treatment for the primary omental torsion.

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Primary omental torsion (POT) is a rare cause of acute abdomen in children. Its clinical presentation mimics that of acute appendicitis.¹ Since its first description by Eitel² in 1899, no distinguishing features have been identified to separate this condition from other causes of acute abdomen. The incidence of this condition is probably underestimated as most

cases are diagnosed at the time of laparotomy and may be missed due to limited exposure used for open appendectomy. But with the recent advances in laparoscopy, primary omental torsion is being recognized with increasing frequency.³ The following report illustrates some common clinical characteristics

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that should raise the index of suspicion and the role of laparoscopy in the diagnosis and treatment of children with POT presented as acute abdomen. Although it is rare in children, the pediatric surgeon should be aware of this diagnostic possibility.

Methods. This is a retrospective study of all the patients with primary omental torsion who were treated in King Khalid University Hospital, Riyadh, Saudi Arabia from August 1999 to December 2004. The medical records of the patients were reviewed in respect to age, gender, weight, height, presenting complaints, physical examination, investigations, preoperative diagnosis, intra operative findings, treatment applied, pathological diagnosis and outcome. Patients with secondary omental pathology were excluded from this study.

Results. Six patients were included. Five boys and one girl. Their age ranging between 9-12 years (average 10.4 years) (Table 1). All the children presented with abdominal pain of 3 to 5 days duration. Pain was localized in the right lower quadrant in all patients. Nausea and vomiting was present only in one patient and other 5 had no associated gastrointestinal symptoms. A low grade fever was present in one patient. There was no history of abdominal trauma. On examination, all children were noted to be obese. In each patient body mass index (BMI) was greater than 30 kg/m² (Table 1).

Right lower quadrant tenderness and guarding were noted in all patients. No masses were palpable and bowel sounds were either present or diminished. Total white blood cells counts were normal in all 6 patients. Abdominal ultrasonography examinations were unremarkable. Because of increasing severity of the abdominal pain and persistent tenderness, each underwent laparoscopic exploration for possible appendicitis. Diagnostic laparoscopy was performed through an umbilical 5-10 mm trocar. A

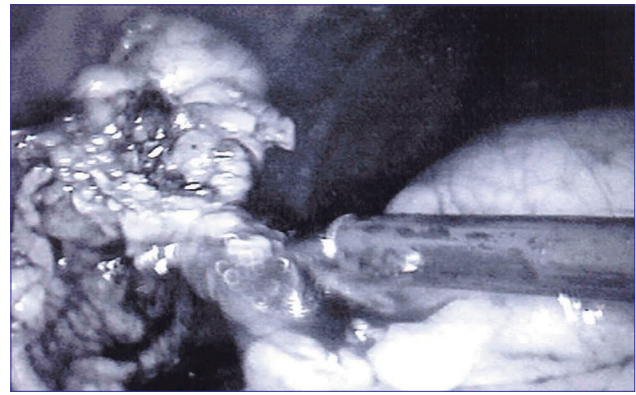


Figure 1 - Omental torsion seen laparoscopically.

5 mm trocar in left lower quadrant and another 5 mm trocar in suprapubic area were used to complete the procedure. Appendix was normal and a small amount of serosanguinous fluid was present in all cases. On further exploration, the infarcted segment of omentum was clearly seen in all 6 cases. No other abnormal pathology was discovered. The torted pedicle of the infarcted omentum was identified on blunt dissection under laparoscopic vision (Figure 1). The infarcted omentum was resected laparoscopically using an ultracision harmonic scalpel (Ethicon Endosurgery INC, Johnson and Johnson, U.S.A.) and was delivered out through umbilical port site, which was enlarged slightly. Incidental appendectomy was also performed. All patients had uneventful recovery and were discharged on the second post operative day. Histopathological examination of all specimens showed necrotic, infarcted omentum with no other abnormalities. Follow-up documented complete resolution of the patient's symptoms.

Discussion. Although primary omental torsion is rarely diagnosed preoperatively, knowledge of this entity is important to the surgeon as it mimics the

Table 1 - Clinical and laboratory data of patients with omental torsion.

Patient No.	Age (Years)	Gender	Duration of symptoms (Days)	BMI* (kg/m ²)	Temperature (°C)	WBC Count (5 - 15.5 x 10 ⁹ /L)
1	11	M	5	36.3	37.8	13.1
2	12	M	4	34	36.5	13.9
3	11	F	4	31.4	37	10.5
4	9	M	3	30.7	36.8	10
5	10	M	4	32.4	37.2	12.7
6	9.5	M	3	31	37	11.6

*Body mass index = weight/height², WBC - white blood cells

common causes of acute surgical abdomen. Credit for the description of idiopathic omental infarction has been attributed to Bush (1896)⁴ and Ebert (1920).⁵ But primary infarction of the omentum due to omental torsion was first described by Eitel² in 1899.

Torsion of the greater omentum can be either primary or secondary. In primary torsion, a mobile segment of omentum rotates around a proximal fixed point in the absence of any associated intra-abdominal pathology. Although the precise cause is unknown, both predisposing and precipitating factors in the pathogenesis of the condition can be identified. Suggested predisposing factors include anatomical variations of the omentum itself such as (accessory omentum, bifid omentum, tongue like omental projections) redundant omental veins and obesity.⁶ The common observation of obesity in our 6 cases is confirmative of this as a significant predisposing factors in children. The children in our series were all overweight and frankly obese (BMI>30 kg/m²). In obese children the increased fat deposition perhaps outstrips the blood supply to the developing omentum. This could lead to either relative ischemia as the inciting event, increased omental weight leading to torsion, or tractions to the most distal part of the omentum.⁵ Precipitating factors include trauma, over exertion or a sudden change in body position.⁶ Secondary omental torsion is rare in childhood and is associated with intra abdominal pathology such as omental cysts, hernias, tumors and adhesions.

The most frequent presentation is the pain and tenderness in the right iliac fossa, thus mimicking appendicitis.⁷ However, atypical of appendicitis are the absence or paucity of gastrointestinal symptoms as in our 5 patients. Children with omental infarction are constitutionally well, hungry, afebrile and without elevated white blood cell count. These accounts for the delay in seeking surgical evaluation. Such a clinical picture developing in an overweight child should raise the suspicion for omental infarction. Although ultrasound may help to identify the omental abnormality, its accuracy in the setting of omental torsion has not been fully evaluated. Few reports have suggested certain distinctive features in computed tomographic (CT) scan.^{8,9} The CT scans delineate the infarcted omentum as a well-defined area of high attenuated fat continuing hyper attenuating streaks immediately deep to the parietal peritoneum with secondary thickening and inflammation of the overlying anterior abdominal wall. However, CT scan rarely performed in patients with suspected acute appendicitis. Therefore, laparotomy or laparoscopy were the only alternatives available to the surgeon to reach the diagnosis and treat the POT.

The presence of free sterile serosanguinous fluid within peritoneal cavity with normal appendix, findings that were observed in all of our patients with this diagnosis, should raise suspicion and should bring to mind with the possibility of primary omental torsion. Oguzkurt et al¹⁰ considered the presence of serosanguinous fluid within the peritoneal cavity a universal finding. These findings require complete examination of the omentum and the whole abdominal cavity. These examination can be difficult through a Lanz or Mc Burney or any small infra umbilical incision. The use of laparoscopy has become widespread among surgeons and is a highly valuable diagnostic and therapeutic tool. The visualization achieved with the laparoscopy allows us to examine the whole abdominal cavity and to see the twisted omentum in its initial position. During laparotomy the omental may be displaced as a result of the use of surgical instruments or the maneuvers of the surgeon to explore the cavity.

Management of the POT after diagnosis is relatively straight forward and consists of resection of the involved omental segment. Conservative management is not recommended as it is associated with a complications like abscess, adhesions and stricture formations.¹¹ Surgical treatment results in a much faster recovery and pain control and prevent possible sepsis.^{12,13} Incidental appendectomy appears safe and is recommended in all cases.¹⁴

Resection of the twisted omentum can be performed laparoscopically with endoscopic loop, the harmonic scalpel, ligasure or electrocautery. The specimen can be easily removed through the hole of 10 mm trocar with slight extension. Methods of ligating the omentum externally after delivering it through extended umbilical port site wound or placing the resected specimen in a bag and delivering the bag via extended umbilical port site have been described.¹⁵

In conclusion, with the advent of diagnostic and therapeutic laparoscopy, POT may become a more frequently recognized clinical entity. Its diagnosis is usually difficult and almost impossible pre-operatively. Obesity seems to be a major predisposing factor in the developing of POT in children. The presence of serosanguineous peritoneal fluid with no other intra abdominal pathology at exploration should raise one's index of suspicion. On the era of mini invasive surgery, laparoscopy is the best alternative to diagnose and treat primary omental torsion. It ensures a fast recovery, better pain control, good cosmesis and minimizes surgical aggression and complications related to the laparotomy wound.

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