



The use of minimally invasive surgery in the management of idiopathic omental torsion

The diagnostic and therapeutic role of laparoscopy

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ARTICLE INFO

Article history:

Received 22 February 2011

Accepted 24 February 2011

Available online 31 March 2011

Keywords:

Omentum

Torsion

Infarction

Laparoscopy

Computed tomography

ABSTRACT

Omental torsion is an unusual and infrequently encountered cause of acute abdominal pain in adults. Computed tomography (CT) is a useful adjunct to clinical history and examination in establishing the diagnosis; however, definitive diagnosis is frequently established at the time of exploratory surgery. Treatment may be conservative or operative, with laparoscopic resection the surgical approach of choice. We report the case of a 60-year-old man who presented with a 3-day history of severe right-sided abdominal pain. Abdominal CT scan revealed a right upper quadrant mass with a whirl-like appearance, suspicious for omental infarction. Diagnostic laparoscopy was undertaken, the diagnosis confirmed and the diseased omentum resected. The patient was discharged the following day and made an uncomplicated recovery.

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1. Introduction

Omental infarction was first described by Bush in 1896,¹ and this was closely followed by the first report of omental torsion by Eitel in 1899.² A retrospective Mexican study reported an incidence of omental torsion of 0.37% compared to appendicitis, i.e. less than 4 cases per every 1000 cases of appendicitis.³ In terms of clinical presentation and outcome, the difference between infarction and torsion is negligible. It is more common in males than females and usually occurs in the 4th and 5th decades of life.⁴ Patients usually present with a single episode of right-sided abdominal pain, localised guarding and rebound tenderness.^{5,6} Of note, recurring episodes of abdominal pain have been attributed to recurrent omental torsion with spontaneous resolution.⁷ A mass may be palpable depending on the extent of omental involvement and/or patient's body habitus. Pyrexia is not uncommon at presentation and laboratory investigations often demonstrate a leucocytosis and elevated CRP.⁵ The most likely differential diagnoses includes acute appendicitis, acute cholecystitis and ovarian cyst torsion in females.

Omental torsion may be either primary or secondary. The etiology of primary torsion remains unknown, but anatomical variants of the omentum,⁸ sudden movements, obesity, rigorous exercise and hyperperistalsis have all been implicated in the etiology of omental torsion/infarction.⁹ Secondary torsion results from existing intra-abdominal pathology, e.g. a hernia, cyst, inflammatory process or tumour. Secondary torsion is more common than

primary torsion and right-sided torsion more common than left-sided.¹⁰

2. Case report

A 60-year-old man presented to the Emergency Department complaining of right-sided abdominal pain of 3 days duration. The pain was localized to the right upper quadrant and was both severe and progressive. The patient reported associated anorexia but no vomiting. He had no relevant medical history of note. On examination, the patient was hemodynamically stable and afebrile. Diffuse, right-sided abdominal tenderness was noted, predominantly in the right upper quadrant where there was also an associated fullness on palpation.

Routine laboratory tests demonstrated a C-reactive protein (CRP) level of 120.2 mg/l. There was no leucocytosis ($8.0 \times 10^9/l$) and the renal profile, liver function tests, serum amylase level and urinalysis were within normal range. A computed tomography (CT) scan of the abdomen was performed and this demonstrated a 6 cm × 6 cm × 10 cm area of segmental intraperitoneal fat stranding with a whirl appearance. This abnormality was located just deep to the anterolateral abdominal wall, inferior to the right lobe of the liver and superolateral to the hepatic flexure of the colon (Figs. 1 and 2). The patient was commenced on intravenous antibiotics and scheduled for an emergency diagnostic laparoscopy later that day.

General inspection of the abdominal cavity was performed following establishment of a pneumoperitoneum using an infraumbilical Hasson technique. A large yellow mass with areas of bluish discoloration (consistent with omental infarction and/or torsion)

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Fig. 1. Coronal section of abdominal CT scan. Note the fat stranding with a whirl appearance inferior to the right lobe of the liver.

was noted in the right upper quadrant adherent to the abdominal wall. The appendix, gallbladder and the remainder of the abdominal viscera were normal in appearance. Two 5 mm ports were placed on the left side of the abdomen and the omental mass mobilised using an atraumatic grasping device and the LigaSure Impact electrocautery device (Valleylab, Boulder, Colorado, USA). Following mobilization and resection of the infarcted segment of omentum, the specimen was placed in an extraction bag which was retrieved through a small incision in the right upper quadrant. All incisions were closed in a standard fashion. The patient was allowed oral fluids and diet the evening of surgery and was discharged on the first postoperative day with minimal oral analgesic requirements. At the time of pathological analysis, a fibrous band traversing the omentum was noted with normal yellow, soft, fatty omentum on one side and firm, hemorrhagic and necrotic omentum on the other side (Figs. 3 and 4).



Fig. 2. Transverse section of abdominal CT scan. There is a marked abnormality in the right upper quadrant.

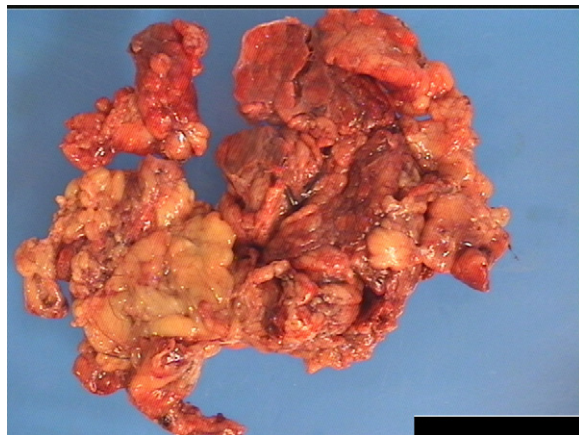


Fig. 3. Gross specimen of resected omentum. Note the difference in color between the left (normal) and the right (abnormal) sides of the specimen, due to the presence of a fibrous band (not shown).

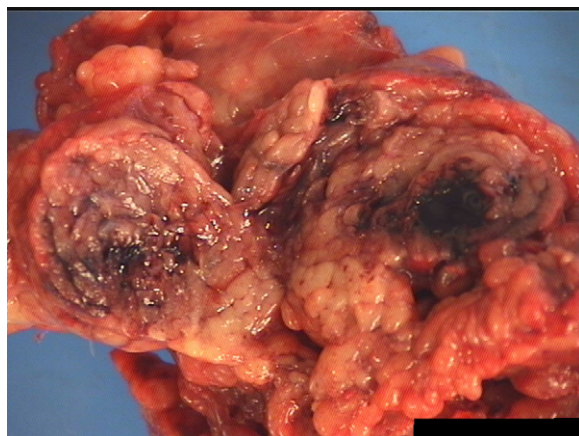


Fig. 4. Transverse section of resected omentum. Note the extensive necrosis with associated inflammation and haemorrhage.

3. Discussion

Infarction of the omentum, with or without associated torsion, is a rare cause of the acute abdomen in the adult population. Historically, diagnosis was often made intraoperatively at the time of laparotomy, usually for another presumed pathology, e.g. appendicitis or cholecystitis. With the advent of CT and to a degree, ultrasound, the diagnosis is now often suspected prior to surgical intervention.

CT is the diagnostic modality of choice and its use is widely reported.^{11–14} CT often demonstrates the classic ‘whirl’ pattern associated with omental torsion and has the added benefit of excluding other differential diagnoses being considered such as acute appendicitis or cholecystitis.⁹ However, the whirl sign remains the only consistent CT finding and can also be observed in other conditions including a lipoma, liposarcoma, epiploic appendagitis and mesenteric lipodystrophy.¹⁴ Although CT has well described limitations in the diagnosis of omental infarction, it is critical as an adjunct to clinical examination in helping to formulate a management strategy.

There are two well-documented treatment strategies for omental torsion: conservative medical management and surgical intervention using laparoscopy. Conservative treatment comprises the use of analgesics with or without antibiotics,⁹ although this

strategy is not without the potential for complications.^{15,16} Some authors advocate this as the initial approach for all patients, with laparoscopy remaining an option for those who deteriorate or in whom there is no observed symptomatic improvement.^{5,17} In 1992, Chung and colleagues first described laparoscopic management of omental infarction¹⁸ and laterally most surgeons would advocate laparoscopy as the primary surgical approach for suspected omental infarction as it is both diagnostic and therapeutic.^{4,19} However, it should be noted that a CT scan was not routinely performed in all patients in these series and thus a formal 'conservative' approach with non-operative management was not always attempted.

In this case, a CT scan suggested the likely diagnosis of omental infarction. The patient had a 3-day history of worsening abdominal pain and thus a diagnostic laparoscopy was necessary. Had the patient presented at an earlier time in his clinical course, a trial of conservative management following CT scan may also have been appropriate. A diagnostic laparoscopy confirmed omental infarction and facilitated omental resection; due to the size of the infarcted omentum a small right upper quadrant transverse incision was required to extract the specimen. The use of a minimally invasive approach facilitated diagnosis and treatment while obviating the need for laparotomy. The patient had minimal post-operative discomfort and was discharged on the first postoperative day.

From both a patient and economic standpoint, initial management (following a diagnostic CT in all patients) with laparoscopy has been shown to result in a shorter hospital stay than conservative management (2 days versus 4 days).²⁰ Laparoscopy is favoured by many as the approach of choice to the acute abdomen. It allows for confirmation of radiological findings or initial diagnosis if no radiological investigation has been performed. It also has an ever growing therapeutic role in the acute abdomen, with the management of acute appendicitis, acute cholecystitis, perforated diverticulitis, Meckel's diverticulum and ovarian torsion among the more common aetiologies.

4. Conclusion

Omental infarction is an uncommon clinical entity. A high index of suspicion should be present in patients with minimal gastrointestinal symptoms having pain out of proportion to objective clinical findings on examination. CT scan of the abdomen and pelvis should be undertaken to outrule other serious acute pathology and may confirm the suspected diagnosis of omental infarction. An initial trial of non-operative management, comprising regular analgesia with or without intravenous antibiotics, is recommended in patients who present early in the course of their illness. Should the patient's condition disimprove surgery is warranted. The surgical approach of choice is diagnostic laparoscopy as it facilitates diagnosis and therapeutic intervention.

Conflict of interest

The authors declare they have no conflict of interest with regard to the potential publication of this case report.

Funding

None.

Patient consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

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