Right sided omental torsion associated with inguinal hernia: CT imaging features

Azurah Zainal Abidin, Kartini Rahmat *, Yang F. Abdul Aziz

Department of Biomedical Imaging, University of Malaya Medical Centre, Kuala Lumpur, Malaysia

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Abstract
Torsion of the omentum is a rare cause of acute abdomen, often clinically mimicking acute cholecystitis, acute appendicitis, caecal diverticulitis and various other diseases. The majority of cases of omental torsion and infarction reported in the literature involve the right side of the omentum. Clinical findings are nonspecific and since conservative treatment has been suggested, imaging features are essential for diagnosis.

We describe a case of surgically proven torsion and infarction of the omentum, which demonstrated characteristic whirling pattern on CT scan.

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1. Introduction
Torsion of the omentum is a rare clinical event which is not usually diagnosed until surgically operated for acute abdomen that has been interpreted as appendicitis [1,2]. Clinical findings are non-specific and since conservative treatment has been suggested [1], imaging features are essential for diagnosis.

We report a case of surgically proven torsion and infarction of the omentum, which demonstrated characteristic whirling pattern on CT scan.

2. Case report
A 36-year-old man presented to the Emergency Unit with colicky right iliac fossa pain of 1-week duration. The pain had been more intense for the past 4 days prior to presentation. In addition, the patient also had mild jaundice, tea-coloured urine, and increase in frequency of micturition. There was also intermittent mild fever. There was no nausea, vomiting or diarrhoea. The full blood count was essentially normal apart from a raised white cell count of 18.3 × 10^9/L. However, the liver function test results showed raised levels of bilirubin, alanine transaminase (ALT), aspartate transaminase (AST) and gamma glutamyl transferase (GGT). In view of these clinical findings, the patient was admitted to the medical ward under the gastroenterology unit with a provisional diagnosis of acute hepatitis.

A contrast enhanced CT examination of the abdomen and pelvis showed a right inguinal hernia which contained omentum. There was an ill-defined soft tissue mass composed mainly of fat density noted within the right iliac fossa. There was also increased streakiness within the omentum in a whirling pattern (Figs. 1 and 2). The whirling omentum was seen extending from the right iliac fossa towards the inguinal region (Figs. 3 and 4). These changes do not involve the bowel and appear to push the bowel away. The bowel wall was not thickened. A faecolith was noted in the region of the caecum. The impression at that time was that of right omental hernia with torsion of the omental fat.

Exploratory laparotomy revealed a right inguinal hernia containing gangrenous haemorrhagic omentum. 150 mL of blood-stained peritoneal fluid was removed. At the neck of the...
Fig. 1. Axial contrast enhanced CT image through the mid abdomen showing the whirling pattern of the torsed omentum (arrowhead).

Fig. 2. Axial contrast enhanced CT image of the mid abdomen showing the torsed omentum situated in the right side of the abdomen. The asterisk denotes the epicentre.

Fig. 3. Axial contrast enhanced CT image through the lower abdomen showing a right inguinal hernia containing the torsed omentum (arrow).

Fig. 4. Coronal reformat contrast enhanced CT image of the abdomen showing a right inguinal hernia containing the torsed omentum (arrow).

hernia, twisting of the omentum with associated thrombosed vessels was seen. The gangrenous omentum was resected and the patient recovered well after surgery.

3. Discussion

Since omental torsion was first described in 1899, fewer than 250 cases have been reported [1]. Torsion of the omentum is a rare cause of acute abdomen, often clinically mimicking acute cholecystitis, acute appendicitis, caecal diverticulitis, epiploic appendagitis, and various other diseases [2,3]. Omental torsion can be classified as primary or secondary, the latter being more common [3]. For primary torsion of the omentum to occur, there must be a redundant, mobile segment of tissue and a fixed point around which the segment can twist [1]. Factors that predispose a patient to torsion include anatomical variations in the omentum itself, e.g., accessory omentum, bifid omentum, irregular accumulations of omental fat (in obese patients), and narrowed omentum pedicle. Any redundancy of omental veins may lead to kinking and twisting around the shorter and tenser arteries [4]. The majority of cases of omental torsion and infarction reported in the literature involve the right side of the omentum [1]. The higher incidence of torsion on the right side of the omentum is related to its greater size and mobility [4].

Secondary omental torsion is more commonly found, and is associated with pre-existing abdominal pathology. These
include cysts, tumours, foci of intra-abdominal inflammation, postsurgical wounds or scarring, and hernial sacs [3,4]. The precipitating factors are shared in common by primary and secondary omental torsions, which include sudden increase in intra-abdominal pressure after heavy meals, heavy exertion, change in body position, coughing or sneezing, and occupational use of vibrating tools [1,3,4].

The typical clinical features of omental torsion includes pain of sudden onset and duration, which is usually constant and gradually increases in severity. Clinically, the differential diagnoses of omental torsion include acute appendicitis, acute cholecystitis, diverticulitis, epiploic appendagitis, cecal or sigmoid volvulus and many more [3]. CT can help narrow the differential diagnoses by showing a normal gall bladder and appendix. CT findings suggestive of diverticulitis such as visualization of the inflamed diverticulum, marked wall thickening and formation of paracolic abscess are not present in omental torsion [1]. Epiploic appendagitis is usually discovered adjacent to the colon as opposed to omental torsion, and demonstrates a dense, ring-like line surrounding the fatty mass, which is due to thickening of the visceral peritoneum [3]. The CT findings of fatty mass may also be found in lipoma, liposarcoma, angiomyolipoma, teratoma, mesenteric lipodystrophy, and pseudomyxoma peritonei [1,3]. The key to the diagnosis of omental torsion is the presence of characteristic concentric linear strands which was seen in our patient [1,3]. However, it should be noted that this characteristic whirling pattern may not be apparent if the axis of rotation is not perpendicular to the transverse scanning plane [3]. A similar whirling pattern may also be seen in small bowel volvulus but it is usually associated with small bowel obstruction and is centrally located in the mesentery [1].

Free serosanguinous fluid in the absence of any other intra-abdominal pathology is another finding suggestive of omental torsion. When torsion occurs, venous return is compromised; the distal portion of the omentum becomes congested and oedematous and causes haemorrhagic extravasation of serosanguinous fluid into the peritoneal cavity [3].

Since the diagnosis of omental torsion was usually made at laparotomy, the traditional treatment was excision. However, Puylaert described seven patients with right-sided segmental infarction of the omentum that were managed conservatively [1,3]. Others have suggested that surgical treatment may be limited to patients with complications [1]. In our patient, omental torsion was complicated by inguinal hernia and persistent pain, and hence the need for surgery.

In summary omental torsion should be considered as a differential diagnosis in a patient with an acute abdomen and familiarity with CT features is essential in establishing a correct, early diagnosis.

References