CT diagnosis of primary torsion of the greater omentum

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Received 18 May 2004; received in revised form 1 September 2004; accepted 3 September 2004

Abstract

Torsion of the greater omentum is a rare condition of acute abdomen. We, herein, report a 37-year-old man, who presented to the emergency department with right lower abdominal pain, nausea, and fever. The initial clinical impression was acute appendicitis. Preoperative computed tomographic study showed a well-defined, fat-containing mass interspersed with soft-tissue strands in the right lower abdomen and pelvis, and it also induced partial obstruction of the small intestine. This mass was found in connection with a vertical rod of the omental vessels. Surgical exploration revealed torsion of the greater omentum with hemorrhagic infarction. Computed tomography (CT) is a useful imaging modality for making a specific diagnosis. An inflamed fat-containing mass with a vascular pedicle is characteristic for the torsion of the greater omentum.

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Keywords: Omentum; Computed tomography (CT); Abdomen; Acute conditions

1. Introduction

Torsion of the greater omentum can be either primary or secondary. Primary torsion of the greater omentum, first reported by Eitel in 1899, occurs when the omentum twists upon itself, with the formation of a narrow neck in the absence of associated intra-abdominal pathology [1]. The more common type of the secondary torsion of the greater omentum is associated with adhesion of the free end of the omentum to the intra-abdominal cyst, tumor, inflammatory focus, surgical scar, or hernial sac [2,3]. The central portion of the omentum torses between the two fixed points [3]. The clinical symptoms and signs often mimic those of acute appendicitis, and many cases are diagnosed during surgery. With wide use of computed tomography (CT) in patients with acute abdomen, this rare disease may be accurately diagnosed before surgery.

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2. Case report

A 37-year-old man presented to the emergency department with a 4-day history of vague abdominal pain that had progressively intensified and migrated to the right lower quadrant. He also developed abdominal distension, a sensation of fullness, nausea, and a low-grade fever with a temperature of 38°C. He had history of right-sided inguinal hernia and underwent herniorrhaphy 10 years prior to this admission.

Physical examination revealed a distended abdomen, decreased bowel sounds, and muscle guarding with rebound tenderness over the right lower abdomen. The patient’s pulse rate was 96/min, and his blood pressure was 130/90 mmHg. Laboratory examination revealed mild anemia and leukocytosis with a hemoglobin concentration of 11.9 mg/dl and a white blood cell count of 11,000/mm³. The neutrophil/lymphocyte ratio was 71:12.

On radiologic examination, plain abdominal radiography showed mildly increased soft-tissue opacity over the right lower abdomen with segmental dilatation of the loops of the small bowel. Under the clinical impression of acute ap-
Pendicitis with suspected perforation, computed tomography (CT) of the abdomen was performed. The scans revealed a well-defined, lobulated mass lesion primarily of fat attenuation interspersed with soft-tissue strands in the right lower quadrant (Fig. 1A and B). A tubular structure with central contrast enhancement was noted over the cephalic portion of this mass (Fig. 2). In light of the patient’s clinical condition and imaging findings, the clinical impression was an inflammatory mass with a fat component. The preoperative differential diagnoses were a walled-off infectious mass, torsion of the greater omentum, and mesenteric panniculitis (retractile mesenteritis). Other fat-containing intra-abdominal masses, such as lipoma, liposarcoma, angiomyolipoma, were less likely on the basis of the clinical symptoms and CT findings.

During surgery, the omentum was found to twist around its superior point of attachment to the transverse colon, four times in a clockwise manner (Fig. 3). This twisting caused hemorrhagic infarction of the distal segment. Also noted was dilatation and congestion of the small intestine due to adhesion of the ileum to the twisted omentum. A small amount of serosanguineous ascites was found. Gross pathology of the resected omentum showed hemorrhage and necrosis. Microscopic sections showed hemorrhagic infarction and necrotiz-

![Fig. 1. Axial contrast-enhanced CT scans obtained at the level of the lower abdomen (A) and pelvis (B) reveal a lobulated mass of fat density and interspersed with soft-tissue strands (arrow).](image-url)
ing inflammation with infiltration of inflammatory cells. The patient recovered uneventfully and without complication.

3. Discussion

The pathogenesis of primary omental torsion is still uncertain. The postulated predisposing factors includes: (1) an anatomic malformation, such as a bifid or tongue-like projection of the omentum; (2) a change in omental consistency due to inflammation, edema, or excessive fat deposition; (3) a vascular anomaly resulting in twisting and kinking of the more redundant vein around the shorter, more tense artery; and (4) obesity [2,3]. Precipitating factors which had been reported includes, coughing; straining; and weight lifting, but other factors, such as Valsalva maneuver after a meal, trauma, vigorous exercise, acute change in body position, hyperperistalsis due to overeating, and the ingestion of laxatives, are possible precipitating factors [2,3]. They may cause rupture and thrombosis of the veins or increase movement and displacement of the omentum [2,3]. The torsion has a right-sided predominance, probably due to the larger size of the right-
sided omentum with greater redundancy [4]. When torsion of the omentum occurs, venous return is restricted. The distal free end of the omentum becomes congested, with hemorrhagic extravasation into the peritoneal cavity. Ischemia, infarction, and finally, necrosis of the affected omentum may occur when the total arterial supply stops.

Most patients develop constant abdominal pain in the right lower quadrant, low-grade fever and moderate leukocytosis [3,5]. The clinical symptoms may be confused with those of acute appendicitis, but omental torsion is usually atypical with a subacute onset of symptoms and an absence or paucity of nausea and vomiting. Our patient demonstrated obstruction of the intestine, which was secondary to the infarcted omentum adhesive to the adjacent terminal ileum.

Surgical resection of the affected omentum is usually the treatment of choice, because the infarcted omentum may become complicated with abscess formation [7]. Laparoscopic surgery is an alternative treatment of choice [5]. Successful conservative treatment had been reported in only seven cases of segmental omental infarction that was eventually atrophied and fibrosis on radiologic follow-up [6].

Sonography may reveal a hyperechoic mass lesion composed of inflamed fat [6,8]. CT provides excellent delineation of the characteristic features of a fat-containing mass with a converging or a whirling distribution in the anterior aspect of the middle and lower abdomen [3,4,9,10]. The imaging differential diagnoses of an omental torsion include mesenteric panniculitis, epiploic appendagitis, gossypiboma, and fat-containing tumors, such as lipoma, liposarcoma, teratoma, and angiomylipoma; however, the clinical symptoms may enable further differentiation between an inflammatory process and a neoplasm [4,10–12]. Moreover, the presence of a rod-like vascular structure extending from the cephalic portion of the mass to the level of transverse colon allows the differentiation of torsion of the greater omentum from the other fat-containing lesions, and our case also demonstrated the similar feature [3,4,13]. Meticulous evaluation of this anatomic landmark is crucial for making a specific diagnosis.

References