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CT Findings of Primary Torsion of the Greater Omentum with Segmental Infarction: Case Report[1]

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Herein, we report on a case of primary torsion of the greater omentum with segmental infarction, which should provide useful information for the preoperative diagnosis of future such cases. Primary torsion of the greater omentum with omental infarction is a rare condition. There are only a few radiological reports of secondary torsion of the greater omentum caused by the hernial sac. During surgical exploration, infarction of the greater omentum was identified, due to the observation of omental torsion without any underlying cause. We describe a patient with characteristic computed tomography (CT) findings of primary omental torsion with segmental infarction, which correlated with the operative and pathologic results.

Index words : Omentum
Torsion
Images
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Primary torsion of the greater omentum with omental infarction is a rare condition. Infarction of the omentum causes localized acute abdominal pain and can therefore mimic other surgical emergencies. There is little information on this condition to be found in the radiological literature, because it is not usually diagnosed until surgical intervention, being previously diagnosed as acute appendicitis or acute cholecystitis (1, 2). There are only a few radiological reports of secondary torsion of the greater omentum caused by the hernial sac (1 - 3). In this report, we present the CT findings of a case of primary torsion of the greater omentum with segmental infarction, which should contribute to the correct preoperative diagnosis of future occurrences of this condition.

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Case Report

A 43-year-old man presented with a one-day history of right lower quadrant pain, without any previous history of such problems. He underwent laparotomy in a local clinic due to suspected acute appendicitis. Upon laparotomy, multiple omental masses, omental necrosis and old bloody ascites in the peritoneal cavity were observed along with a normal appendix. After closure of the abdomen, the patient was referred to our surgical department for proper treatment of the omental mass. On admission, the patient was afebrile with normal laboratory findings. Leukocytosis was not present.

In an attempt to identify the of the omental mass, we performed an abdominal CT scan. Contrast-enhanced CT revealed a counter clockwise whirling patterned greater omentum with an inner high-density vascular structure (Fig. 1A). Also, contrast-enhanced CT revealed an irregular shaped soft tissue infiltration of the greater

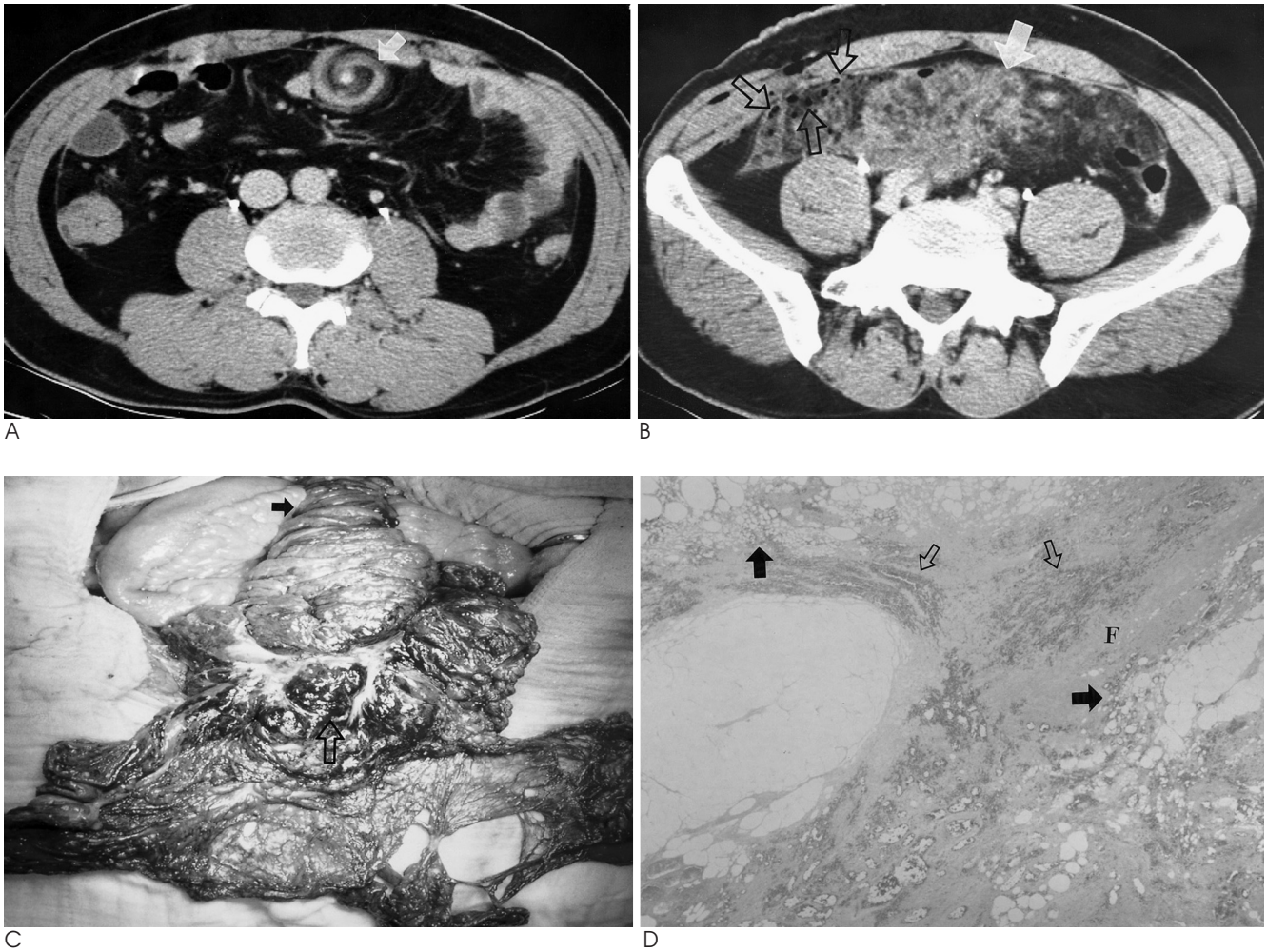
omentum at the level of the mid and lower abdomen, without any intra-abdominal mass (Fig. 1B). There was no evidence of bowel ischemia or infarction on the CT findings.

The patient underwent exploration. During surgery, omental torsion and omental infarction were identified without any underlying cause being identified (Fig. 1C). The transverse colon and mesentery were normal. Partial omental resection and incidental appendectomy were performed.

During the histopathologic examination, the omental venous structure showed congestion and a blood clot. The histological diagnosis was diffuse omental fat necrosis, hemorrhage, fibrosis and acute inflammation (Fig. 1D).

Discussion

Omental torsion means a partial or total rotation of the omentum around its main axis. Primary omental torsion is unipolar, where one end of the omentum remains fixed while the other end is free, whereas secondary omental torsion is bipolar with the free end attached either to adhesions or to some other pathological condition (4, 5). Primary torsion has several predisposing factors, such as a bifid omentum or tongue like omental projections, and changes in the omental consistency (4, 5). Secondary torsion is more common and its etiology



A B C D

Fig. 1. A. Contrast-enhanced CT section of the mid-abdomen demonstrating a whirling patterned greater omentum with an inner high-density vascular structure (arrow).
B. Contrast-enhanced CT section of the lower abdomen showing irregular shaped increased density (arrow) in the greater omentum. There is focal free air (open arrows) in the right omentum and abdominal wall due to a previous operation.
C. On exploration, a primary omental torsion (arrow) and omental infarction (open arrow) were observed. Venous congestion and a blood clot (arrow) were observed in the central portion of the omentum.
D. Photomicrograph (hematoxylin & eosin staining, ×100) of the omentum shows fat necrosis (arrows), hemorrhage (open arrows) and fibrosis (F).

includes intraabdominal hernia, inflammation, cyst, tumor and previous laparotomy (4, 5). When torsion occurs, venous return is compromised, with the result that the distal portion of the omentum becomes congested and edematous with hemorrhagic extravasation of serosangeneous fluid into the peritoneal cavity, and aseptic peritonitis ensues (4). As the torsion proceeds, arterial occlusion leads to hemorrhagic infarction and fat necrosis, followed by an inflammatory reaction (4).

The symptoms of omental torsion are nonspecific and largely dependent on the degree and duration of torsion (4). Nausea, anorexia and vomiting are uncommon symptoms, occurring in less than half of the patients affected by this condition (4). Focal tenderness with varying degrees of peritonism is found on examination (1). This disease can cause acute, as occurred in our patient, with tenderness and guarding of the right lower quadrant (4, 7). When the pain is on the right, acute appendicitis, cholecystitis or right renal colic may be considered in the differential diagnosis, depending on the findings of the clinical examination. There may be fever or leukocytosis (4, 7).

Cross-sectional imaging can establish a diagnosis of omental infarction in the proper clinical settings. So CT and/or ultrasound (US) can be extremely helpful in establishing the diagnosis. The US examination shows a hyperechoic, localized, usually paraumbilical mass (8, 9). CT demonstrates a heterogeneous fatty mass anterior to the colon; adherent to an inflamed parietal peritoneum and containing strands of soft tissue attenuation (8, 9). The appearance of irregular shaped soft tissue lesions with infiltration of the greater omentum at the level of the mid and lower abdomen enables the radiologist to differentiate omental infarction from a mass of omental origin.

In our case, omental torsion was observed, which be established preoperatively with cross-sectional imaging. Our CT showed whirling fatty tissue in the greater omentum with an inner high density corresponding to a central vessel. On correlation with the gross section, the intravascular high density was identified as venous congestion and a blood clot. The lesion had a characteristic superficial paraumbilical location situated between the rectus abdominis muscle and the transverse colon, corresponding to the greater omentum. 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 (6).

The management of patients with segmental infarction of the omentum is controversial. To reduce the possibility of subsequent adhesion formation, resection of the involved segment is recommended in the surgical literature (4, 5). However, in some literatures it was reported that a right-sided segmental infarction of the greater omentum could be managed by conservative treatment with good results (8 - 10). The natural history is that of resolution of the inflammatory process with retraction, fibrosis and either complete resolution or autoamputation (1). Based on the information at hand, conservative management with symptomatic relief and clinical and radiological follow up would seem to constitute a reasonable approach.

In conclusion, we report on a case of primary omental torsion with segmental infarction and characteristic CT findings. The diagnosis of this condition is hardly ever made purely on clinical grounds, as it mimics the symptoms of appendicitis. It is possible to obtain a correct preoperative diagnosis by means of CT, in which case conservative treatment represents a viable alternative, thus avoiding surgical resection.

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부분 경색을 동반한 원발성 대망염전의 CT 소견: 증례 보고[1]

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전용선 · 조순구 · 김원홍 · 김미영 · 서창해

저자들은 부분 경색을 동반한 원발성 대망 염전의 CT 소견 1예를 보고 하고자 한다. 부분 경색을 동반한 원발성 대망 염전은 매우 드문 질환으로, 대부분의 보고는 헤르니아에 의한 이차성 대망 경색 이다. 저자들의 증례는 수술 소견상, 다른 원인 없이 발생한 원발성 대망 염전에 의해서 부분 경색이 발생된 것으로 나타났다. 이제 저자들은 부분 경색을 동반한 원발성 대망 염전의 특징적인 CT 소견을 수술 소견과 조직 검사 결과와 연관하여 보고 하고자 한다.