E-QUID: ANSWER / Gastrointestinal imaging

Volvulus of the greater omentum in a right inguinal hernia. Answer to the e-quid ‘‘Unusual cause of acute abdominal pain’’☆

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Case report

This 27-year-old man had surgery 3 years ago for a bilateral inguinal hernia. He reports rapidly progressive abdominal pain over the past week, with vomiting and a temperature of 37.8°C. Clinical examination found diffuse abdominal guarding with a reducible right inguinal hernia.

The ultrasound showed an oval-shaped echogenic mass at the right flank, without any intraperitoneal effusion. The patient had CT of the abdomen and pelvis, with contrast product, in axial slices with sagittal reconstruction (Fig. 1).
**What is your diagnosis?**

Based on your reading of this case report, which of the following diagnoses would you choose:
- acute epiploic appendagitis?
- incarcerated Meckel diverticulum?
- diverticulitis?
- volvulus of the greater omentum?

**Diagnosis**

Volvulus of the greater omentum in a right inguinal hernia.

**Comments**

The most common potential diagnoses for acute pain in the lower right quadrant include acute appendicitis, an
incarcerated Meckel diverticulum, and diverticulitis. CT of the abdomen and pelvis showed the whirlpool sign as a well-circumscribed mass of fat density, with hyperdense striations, arranged typically in coils to the right flank, the lower right quadrant, the pelvis, and into a right inguinal hernia. This mass was attached to the anterior abdominal wall and the adjacent fat densified (Fig. 2). Moreover, we saw no signs of gastrointestinal thickening (especially at the ileocecal junction) or accumulation. The caliber and position of the mesenteric vessels were normal, while the omental vessels were involved in the mass, thus allowing us to diagnose a volvulus of the greater omentum in a right inguinal hernia.

**Discussion**

Volvulus of the greater omentum is omental torsion due to rotation of the omentum on its axis and may involve all or a segment of the greater omentum. It usually affects adults in their 1940s, with a sex ratio of 1.5 men for every woman [1,2].

In 1952, Leitner et al. described omental infarction for the first time, classifying it as primary or secondary; since then it has been reported in many studies [3].

Factors promoting primary volvulus include obesity, malformations of the greater omentum related to the presence of long projections, or a bifid or accessory omentum, as well

![Figure 2](image-url) Abdominal CT after injection of contrast product in axial slices (a, b, c, d) and coronal (reconstruction e); a: whirlpool sign; fat density mass attached to the anterior right abdominal wall; omental vessels involved in the volvulus; right inguinal hernia; omental mass.
as vascular malformations that increase omental weight. Trauma, including rapid rotating movements, blows to the abdomen, and the sudden change of body position, was involved as a factor promoting primary torsion. Secondary torsion was more frequent, occurring together with intra-abdominal diseases such as internal or external hernias, tumors or focal points of inflammation or adhesions [4]. The primary symptom revealing omental torsion is pain, the beginning of which is generally sudden and does not irradiate to the abdominal wall. It is frequently localized in the lower right quadrant of the abdomen and indicative of peritoneal irritation, mimicking appendicitis or acute cholecystitis. There are usually no transit disorders. Nausea and vomiting are rare. Moderate hyperleukocytosis may be noted.

Standard radiography is non specific in most cases of omental torsion. The ultrasound examination found an incompressible echogenic ovoid mass, attached to the abdominal wall.

CT of the abdomen and pelvis, before and after injection of contrast product, reformatted in all three planes, and preferably read on a console, is the reference examination for diagnosing volvulus of the greater omentum. It is shown as a well circumscribed fat-density mass, with hyperdense striations, typically arranged in whorls. The anterior topography, the frank right predominance, and the attachment to the omental vessels are very suggestive of the diagnosis [5].

This case reported here is a typical presentation of the signs described in the literature. From an imaging perspective, the differential diagnoses are acute epiploic appendagitis, abdominal panniculitis, or a large-focal necrosis due to pancreatitis. Epiploic appendagitis is characterized by an anterior or anterolateral location in the ascending or descending colon and small size [4,5]. Intra-abdominal panniculitis is indicated by a higher density fat mass surrounded by a hyperdense halo. Large focal necrosis associated with pancreatitis can on rare occasions appear as a confluent fat mass. Clinical history and laboratory tests, as well as radiologic signs of acute or chronic pancreatitis, help determine the correct differential diagnosis [4]. When omental tissue is involved in torsion, inflammatory infiltration develops, as a mass with undefined borders difficult to differentiate from malignant neoplasms such as liposarcoma and omental metastases.

The course depends on the extent of the segment of greater omentum involved in the volvulus: symptoms may be reduced, or complications such as abscess or bleeding may occur. Although the normal course of omental infarction after conservative treatment by analgesics and anti-inflammatory drugs recommended by some authors has not yet been elucidated, ultrasound examination at 4 weeks and 4 months and scanning at 1 to 3 years have confirmed that the infarction does shrink.

Our patient’s surgical treatment, with excision of the twisted omentum, is the treatment of choice because it relieves pain rapidly and significantly reduces complications such as bleeding, adhesion, and abscess [6].

Conclusion

The radiologic signs associated with the mapping of abnormalities are almost pathognomonic for omental torsion. The role of radiology is essential for diagnosis and management.

Disclosure of interest

The authors declare that they have no conflict of interest concerning this article.

References