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CASE REPORT

Left-sided Torsion of the Greater Omentum

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ABSTRACT

Torsion of the greater omentum is rare and is known to occur more often on the right side. We present an even rarer case of left-sided omental torsion, which was proven surgically and pathologically. Computed tomography showed the characteristic Whirl sign, which consists of concentric hyperdense circular lines. The twisted vasculature within the "Whirl" can be traced back to the gastroepiploic vessels, which supply the greater omentum. The radiological differential diagnosis of omental torsion is discussed.

Key Words: *Abdomen, acute; Abdominal pain; Omentum; Peritoneal diseases; Torsion abnormality*

中文摘要

左側大網膜扭轉

黃文鳳、賈亦尊、周偉強、徐波

大網膜扭轉很少見，大多數病例發生在右面。本文報告一宗非常罕見，經外科和病理確診的左側大網膜扭轉病例。電腦斷層造影顯示此病症典型的旋渦徵象，其內有同心高密度環形線條。旋渦徵中扭曲的血管可追溯至胃網膜血管，這些血管供應大網膜。本文同時討論大網膜扭轉的鑒別診斷。

INTRODUCTION

Torsion of the greater omentum is a rare clinical event.[1] To the best of our knowledge, only a few cases of left-sided torsion have been reported. Clinically, omental torsion can present as acute lower quadrant pain and low-grade fever. Knowledge of the characteristic computed tomography (CT) finding is essential to make a diagnosis. We report a rare case of left-sided omental torsion, complicated by infarction, which was subsequently proven surgically and pathologically.

CASE REPORT

A 53-year-old man presented to the accident and emergency department with localised left lower quadrant colicky pain for 1 day. There was no associated diarrhoea, vomiting, or other bowel symptom. On physical examination, the patient was afebrile. His blood pressure and pulse were unremarkable. Blood tests showed mild leukocytosis (12.5 x 10^9 /l). Initially he received conservative management but his symptoms persisted. He underwent abdominal and pelvic CT. On post-contrast axial scans, a concentric density with a "whirl like" twisting appearance was seen at the left lower abdominal quadrant, anterior to the sigmoid colon (Figure 1). A fatty mass with internal stranding was seen on lower axial section (Figure 2). A vascular pedicle was seen on curved coronal reformatting, which could be traced to the left gastroepiploic artery (Figure 3). There was no associated bowel wall thickening or dilatation. No abnormal intra-abdominal collection was

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seen. A diagnosis of greater omental torsion was made and the patient underwent laparoscopy.

Intra-operatively, torsion of a large piece of greater omentum with gangrenous change was noted. Omentectomy was performed. The patient recovered uneventfully. Gross pathological examination showed pieces of haemorrhagic omentum. Histological section confirmed the presence of haemorrhage and necrosis within omental fatty tissue (Figure 4). No underlying cause leading to torsion was identified.

DISCUSSION

Torsion of the greater omentum is a rare clinical entity. It can be primary or secondary. Primary torsion without any underlying cause is less common. Possible

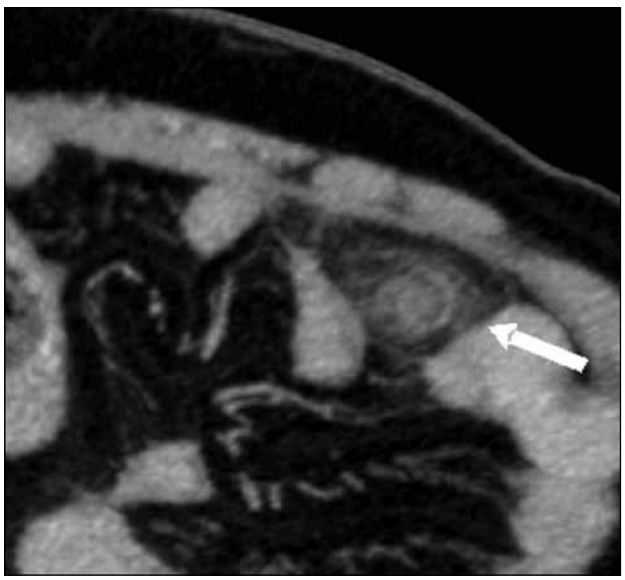

Figure 1. A post-contrast computed tomographic axial scan showing concentric density at the left lower quadrant of the abdomen (white arrow), suggestive of Whirl's sign.

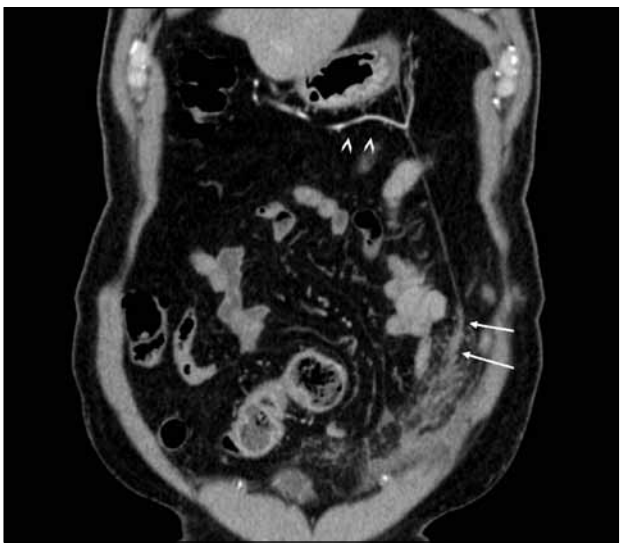

Figure 3. A curved coronal reformatting post-contrast computed tomographic scan. The vascular pedicle (arrows) can be traced back to the left gastroepiploic artery (arrowheads).

Figure 2. An axial scan obtained at a more inferior level than Figure 1. Fatty mass with internal stranding at the left lower quadrant of the abdomen (arrows), which lies anterior to the sigmoid colon (arrowheads).

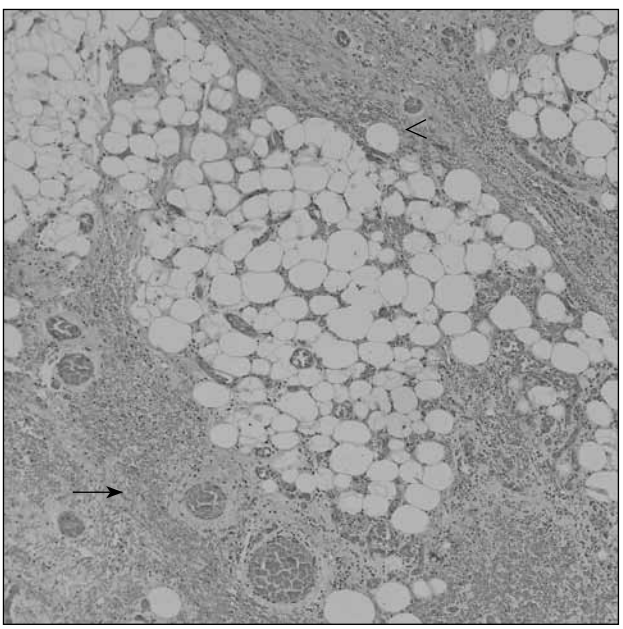

Figure 4. Histology showing extensive haemorrhage (arrow) and infarcted fatty tissue (arrowhead).

predisposing factors include obesity, malformation of the greater omentum with tongue-like projections, a bifid / accessory omentum, and vascular abnormality (e.g. redundant omental veins).[2] Secondary torsion, the more common entity, occurs with underlying abnormalities such as hernial sacs, tumours, and foci of inflammation or adhesions.

Omental torsion usually occurs on the right side of the greater omentum, due to its greater mobility. Left-sided torsion has been reported but is less common.[3] Twisting of the omentum gives rise to mechanical obstruction and hence congestion of venous return. Subsequently inflammation develops with the formation of adhesions and finally necrosis from venous and arterial obstruction.[4]

The greater omentum is a double layer of peritoneum extending downward from the greater curvature of the stomach and proximal part of duodenum and covers the small bowel. The appearance on CT is a band of fatty tissue just beneath the anterior abdominal wall and anterior to the stomach, transverse colon, and small bowel.[5] The greater omentum is entirely supplied by the right and left gastroepiploic artery. The right gastroepiploic artery is a branch of gastroduodenal artery which is a branch of common hepatic artery that arises from the coeliac trunk. The left gastroepiploic artery is a branch of splenic artery, which also originates from the coeliac trunk (Figure 5). The right and left gastroepiploic vessels anastomose with each other within the greater omentum along the greater curvature. The width of the greater omentum depends on the patient's build and hence is more easily identified in obese individuals.

The "vascular pedicle sign" has been described in the literature. It consists of a central-enhancing rod-like structure around which smaller mesenteric vessels twist. The "vascular pedicle" in this case can be identified and traced as originating from the epiploic vessels on coronal reformatting (Figure 3). Thus a definitive diagnosis of omental torsion can be made preoperatively. Tracing of the twisted vasculature is not possible in every case but is usually easier in obese individuals.

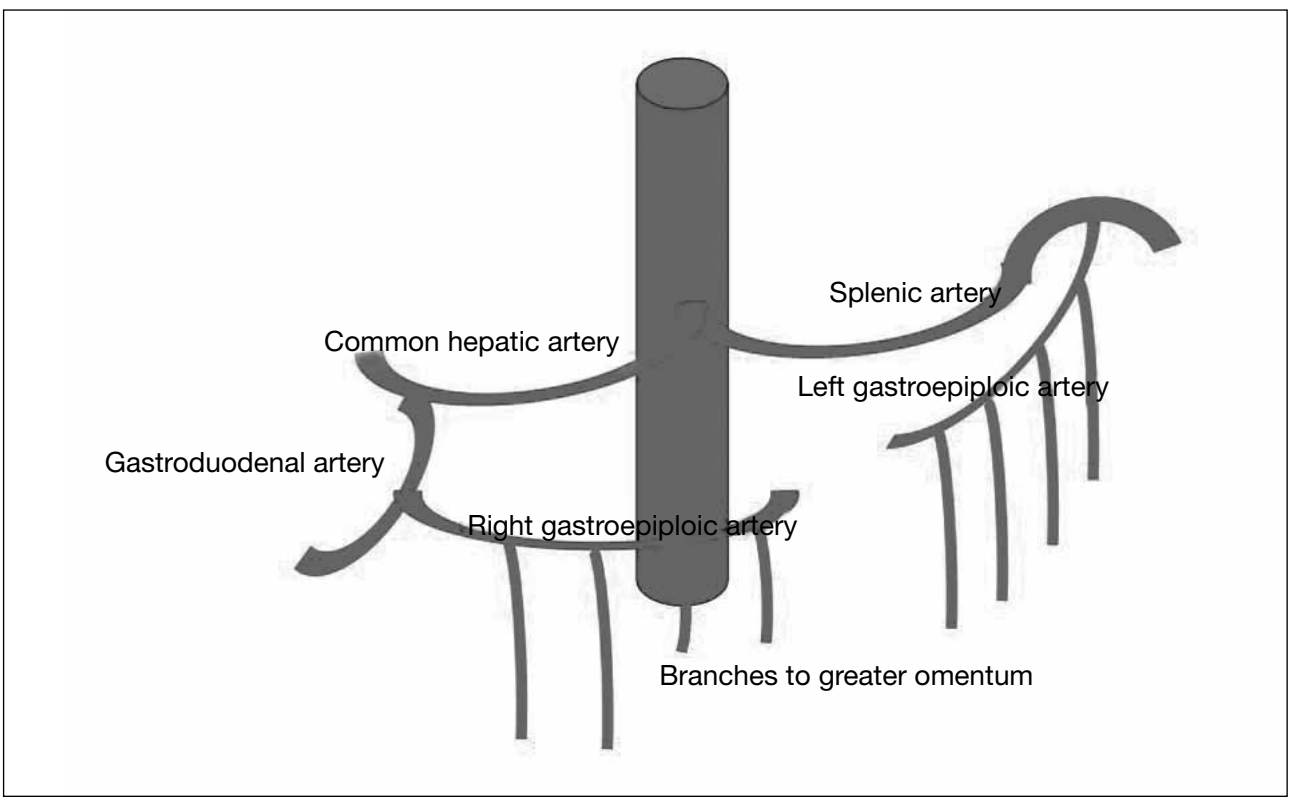

Figure 5. Blood supply of the greater omentum: simplified diagram of the coeliac trunk showing splenic artery and common artery only. The left gastroepiploic artery originates from the splenic artery. The right gastroepiploic artery originates from the gastroduodenal artery, which is a branch of common hepatic artery.

The "whirl sign", which consists of concentric hyperdense circular lines, has also been described in the literature and is suggestive of omental torsion.[6] However, this sign can also be encountered in other conditions, such as small bowel volvulus.[7] In case of small bowel volvulus, the twisted structure is the small bowel mesentery. The small bowel mesentery can be identified by the vasa recta which originates from the superior mesenteric artery.

The twisted vasculature, though specific for torsion, may not be identified in every patient. Other non-specific signs of omental torsion include a fatty mass, interspersed with hyperattenuating streaks.[8] In such cases, the differential diagnosis includes omental infarction without torsion, diverticulitis and epiploic appendagitis.

Omental infarction can be associated with obesity, trauma, overeating, overexertion, laxative use, surgery, sudden postural change, and congestive heart failure. Clinically it presents with right lower quadrant pain, leukocytosis and fever. It is not distinguishable from omental torsion on imaging, unless the twisted vasculature of omental torsion is identified. In diverticulitis, the affected bowel loop inevitably shows thickened walls,[9] which is not common in omental infarction. In addition, inflamed diverticulae and paracolic abscess may be identified in diverticulitis.

Epiploic appendagitis appears as a well-circumscribed oval mass surrounded by a high attenuation ring anterior to the sigmoid. A high attenuation central point or line can be visualised centrally, and is thought to be a thrombosed vein.[10] The presence of a hyperdense ring should help to distinguish it from omental torsion. Also its size is usually 1.5 to 3.5 cm.[11]

On ultrasonography, omental torsion may be seen as a moderately hyperechoic, solid, non-compressible ovoid or cake-like lesion that corresponds to the site of greatest tenderness.[12]

Regarding magnetic resonance imaging, a case report described a fatty structure twisting around a rod of hypodensity on T1-weighted imaging, as well as hypointensity within the fatty mass suggestive of oedema or necrosis.[13]

Although conservative management for omental infarction has been suggested for selected patients,[12] laparotomy / laparoscopy remains the gold standard of diagnosis and treatment. Albuz et al[14] has suggested that delayed treatment may lead to the formation of intra-abdominal abscesses, sepsis, and adhesions.

In summary, torsion of the greater omentum is a rare clinical event. Knowledge of the characteristic CT appearance aids in preoperative diagnosis.

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