

Incarcerated recurrent inguinal hernia as a cause of secondary torsion of the greater omentum: a rare case report and literature review

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Abstract

Torsion of the greater omentum is a rare condition with a low incidence. However, secondary torsion of the greater omentum caused by an incarcerated recurrent inguinal hernia is extremely rare. Such torsion is fairly difficult to diagnose preoperatively because the symptoms are not typical and can mimic those of other causes of acute abdominal disease. If only the incarcerated inguinal hernia is treated, associated torsion of the greater omentum may be missed. We herein report a case of secondary torsion of the greater omentum caused by an incarcerated recurrent inguinal hernia. Exploratory laparotomy was performed because the preoperative computed tomography findings suggested torsion of the greater omentum. The diagnosis of torsion of the greater omentum was confirmed intraoperatively. The patient developed no recurrence throughout the 5-year follow-up.

Keywords

Secondary torsion of greater omentum, primary torsion of greater omentum, exploratory laparotomy, inguinal hernia, computed tomography, case report

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Introduction

Torsion of the greater omentum is a very rare acute abdominal disease. It is caused by rotation of the greater omentum along its longitudinal axis, resulting in disturbance of the blood circulation. This rare condition is more common in middle-aged men.^{1,2} It usually occurs on the right side

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and in a clockwise direction, and the torsion is often complete and sustained.^{3,4} Once the diagnosis of secondary torsion of greater omentum has been confirmed, exploratory laparotomy should be performed in principle. The present case is being reported to increase the awareness and deepen the impression of this disease for clinicians in clinical practice.

Case report

A 38-year-old man presented to our hospital with a 3-day history of rapid-onset right lower quadrant abdominal pain accompanied by nausea but no vomiting, intestinal dysfunction, or fever. His medical history included right inguinal hernia repair 30 years previously.

On physical examination, his vital signs were stable. Abdominal examination revealed an old surgical skin scar in the right inguinal region, which contained a mass of about $5 \times 3 \times 2$ cm. The mass was constant in size, was immovable, and could not be pushed back into the abdominal cavity. It had high tension, a clear boundary and no local inflammation. Some tenderness was present in the right lower abdomen, right inguinal region, and right scrotum. Mild rebound pain was present in the lower right abdomen, but no muscle tension or shifting dullness was present.

Laboratory tests showed a white blood cell count of $14.25 \times 10^3/\mu\text{L}$ and C-reactive protein level of 99.8 mg/L. The remaining routine blood examination findings were normal.

An ultrasound scan revealed a fluid dark area from the right scrotum to the groin area; the ultrasound findings were otherwise unremarkable. An abdominal computed tomography (CT) scan revealed twisting of the greater omentum along the same spiral axis, spotty areas of increased fat density in the omentum, and blurring of the edge of the omentum. These CT findings suggested a right inguinal greater omentum hernia and greater omental torsion (Figures 1–3).

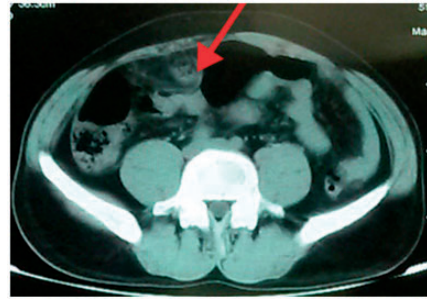


Figure 1. Computed tomography images of right inguinal greater omental hernia and greater omental torsion (red arrow).

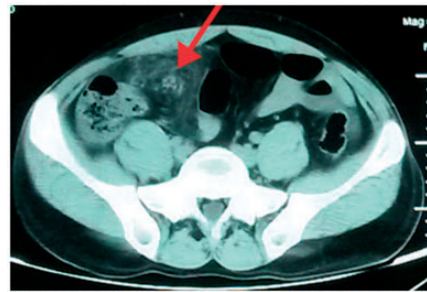


Figure 2. Computed tomography images of right inguinal greater omental hernia and greater omental torsion (red arrow).



Figure 3. Computed tomography images of right inguinal greater omental hernia and greater omental torsion (red arrow).

We performed an exploratory laparotomy through a right paramedian incision with the patient under general anesthesia. We found that the omentum was twisted

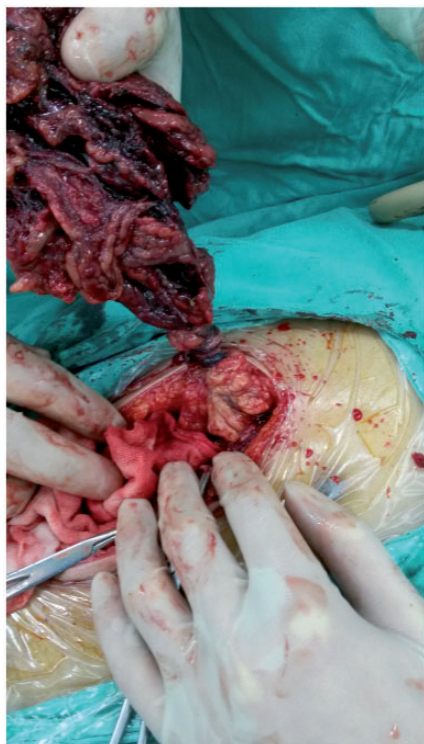


Figure 4. Greater omental torsion and necrosis.

twice in a clockwise direction and that the omentum had an extensive hemorrhagic infarction (Figures 4 and 5). Additionally, a greater omental torsion was present between the superior point of attachment to the transverse colon and the inferior point of attachment to the right inguinal hernia sac (Figure 6). The hernia sac protruded through the inner ring of the inguinal canal on the lateral side of the inferior epigastric artery. A small amount of peritoneal effusion was also found in the abdominal cavity. The other abdominal organs showed no abnormalities. We performed a partial omentectomy and repaired the inner ring in the abdominal cavity without using mesh. Postoperative pathologic examination showed hemorrhagic necrosis of the greater omentum with neutrophil infiltration. The patient recovered well and was discharged 8 days later.

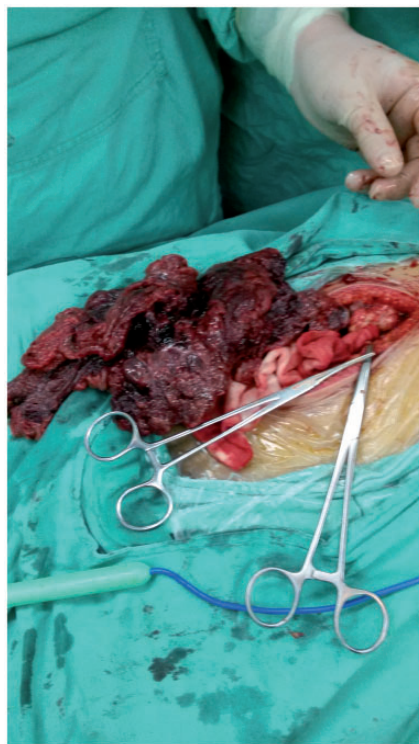


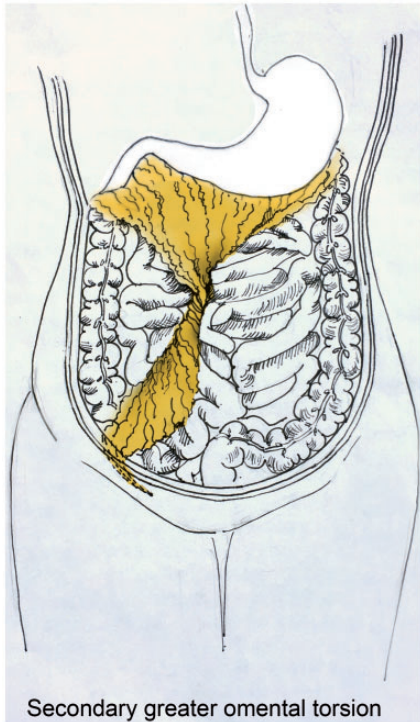
Figure 5. Greater omental torsion and necrosis.

Five years after surgery, no mass was found in the right inguinal area, and no acute abdominal symptoms such as abdominal pain or distension were observed during the 5-year follow-up.

The whole treatment process described in this report conformed to the Chinese diagnostic and therapeutic norms and did not require ethical approval. Verbal consent was obtained from the patient.

Discussion

The pathogenesis of greater omental torsion is unclear. The omental torsion affects venous return, leading to distal greater omental hyperemia and edema. As the torsion progresses, it causes arterial occlusion and leads to acute hemorrhagic infarction and greater omental necrosis.¹

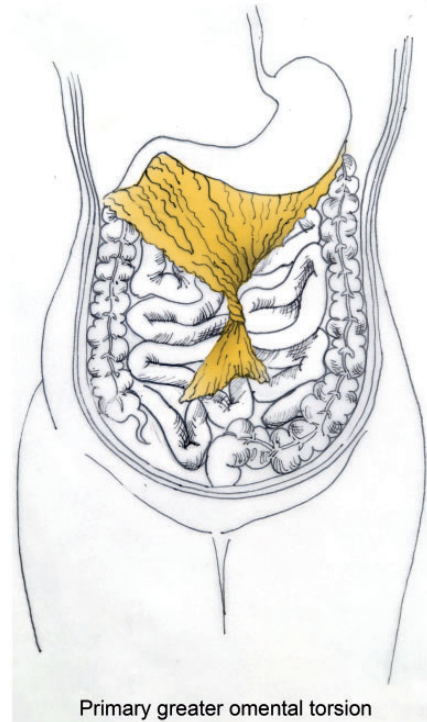


Secondary greater omental torsion

Figure 6. Secondary greater omental torsion.

Greater omental torsion can be divided into primary and secondary torsion. Primary torsion of the greater omentum appears when the reversible thickening of the greater omentum revolves around the proximal fixed point with no secondary intraperitoneal lesions.¹ Such torsion is unipolar with only one fixation point and one free end (Figure 7). The cause of primary torsion of the greater omentum is unclear. It is generally associated with factors such as strenuous exercise, sudden change of position, cough, inflammation, edema, excessive fat deposition (obesity), or anatomical abnormalities.⁵

Secondary torsion of the greater omentum is mostly caused by adhesion between the greater omentum and a preexisting lesion in the abdominal cavity, such as a tumor, inflammatory lesion, hernial sac, or postoperative incision or scar.^{2,3,6} This type



Primary greater omental torsion

Figure 7. Primary greater omental torsion.

of omental torsion is bipolar (Figure 6) and is located between two fixation points.³ In the present case, we considered the following possible causes of the greater omental torsion. (1) The omentum repeatedly herniated into the hernia sac and eventually adhered to the hernial sac. (2) The omentum may have been improperly sutured or ligated in the hernial sac during the first operation, leading to the formation of a distal fixation point.

All causes of increased intra-abdominal pressure, whether primary or secondary, can be considered as triggers.⁷ Such causes include ingestion of a large amount of food, strenuous exercise, sneezing, coughing, abdominal surgery or trauma, sudden change of body position, intestinal peristalsis caused by oversaturation, and pregnancy.⁸

The clinical manifestations of primary and secondary torsion of the greater

omentum are similar. The main symptom is sudden abdominal pain with progressive aggravation, accompanied by gastrointestinal symptoms such as nausea and vomiting. Activity can worsen the pain. The body temperature and white blood cell count are either normal or slightly increased; however, these findings lack specificity.

Routine examination methods such as X-ray and ultrasonography are of little significance in the diagnosis of greater omental torsion; however, CT may be helpful. The CT finding of greater omental torsion is a large abdominal fatty mass with a characteristic spiral pattern, whirling pattern, or hyperattenuated streaks.^{9,10}

The treatment methods of greater omental torsion include conservative and surgical treatments. Conservative treatment includes prophylactic antibiotics, analgesics, and similar measures. However, if persistent abdominal pain and fever are present, surgery should be performed. Successful cases of conservative treatment for primary omental torsion have been reported.^{11–13} For secondary greater omental torsion, because of the presence of intraperitoneal lesions, surgical treatment should be performed once secondary greater omental torsion has been diagnosed.^{14–17}

To prevent omental vein embolization from worsening the condition because it is mistaken for extrusion, the operation should be performed gently and the extent of omental resection should be 2 to 3 cm above the actual torsion. To avoid a large amount of toxins flowing back into the blood through the omental vein and aggravating the symptoms of postoperative poisoning, the necrotic omentum should not be restored before resection.

Notably, two issues of secondary torsion of the greater omentum caused by an incarcerated recurrent inguinal hernia should be carefully considered: the incarcerated hernia and the omental torsion. Inguinal incisions are often used during surgical

repair of an incarcerated inguinal hernia. In this way, not only can the hernia contents be recovered or resected, but the posterior wall of the inguinal canal can also be repaired by the Bassini method, with a shorter operation time and less bleeding. Importantly, however, the omental torsion may be overlooked through the inguinal incision. Therefore, if torsion of the greater omentum is considered, an exploratory laparotomy should be performed through a median abdominal incision, parmedian incision, or transrectus incision instead of an inguinal incision.

Conclusion

Greater omental torsion is rare in the clinical setting. However, greater omental torsion caused by an incarcerated recurrent inguinal hernia is even more rare. This condition is very difficult to diagnose based on its clinical manifestations. No specific examination method is available for this condition, although CT examination can effectively improve the diagnosis rate. Once the diagnosis of secondary greater omental torsion has been confirmed, surgical treatment should be performed in principle. If torsion of the greater omentum caused by an incarcerated recurrent inguinal hernia occurs, exploratory laparotomy should be performed, and a transinguinal incision for surgery should be avoided.

Declaration of conflicting interest

The authors declare that there is no conflict of interest.

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