Case Report
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대한영상의학회지

# Omental Torsion and Infarction with Right Inguinal Hernia: A Case Report

## 우측 서혜부 탈장과 동반된 대망염전과 대망경색: 증례 보고

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Omental torsion and infarction are rare causes of acute abdominal pain, and it is often difficult to diagnose these conditions preoperatively. There are several reports showing that computed tomography is useful to diagnose these conditions. Here, we report a case of a 59-year-old man with omental infarction due to secondary omental torsion associated with an untreated inguinal hernia. Preoperative computed tomography showed a fatty mass in the right lower quadrant and a right inguinal hernia containing torsion of the greater omentum. He underwent laparoscopic partial omentectomy and herniorrhaphy, and the postoperative course was uneventful.

**Index terms**
Omentum
Torsion Abnormality
Abdomen, Acute
Hernia, Inguinal
Computed Tomography

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## INTRODUCTION

Torsion of the greater omentum rarely causes acute abdominal pain. In this condition, the pedicle of the omental apron twists on its longer axis, resulting in compromised vascularity. On contrast-enhanced computed tomography (CT) of the abdomen, the presence of a mass with heterogeneous fat tissue and the whirl sign that resembles concentric lines inside the greater omentum are the typical characteristics of omental torsion (1). Although omental torsion is rarely diagnosed preoperatively, it is important for clinicians and radiologists to have knowledge of this condition because it mimics the common causes of acute surgical abdomen.

Here, we report a rare case of surgically proven omental torsion and infarction associated with an untreated inguinal hernia, which were diagnosed with preoperative CT.

## CASE REPORT

A 59-year-old man presented to our hospital with acute right lower abdominal pain that had started 4 hours previously. He had no underlying disease and no other associated symptoms, such as nausea, vomiting, and diarrhea. His vital signs were assessed immediately. His body temperature was 36.6°C, pulse rate was 98 beats per minute, blood pressure was 165/83 mm Hg, and respiratory rate was 16 breaths per minute. Physical examination revealed marked tenderness over the right lower quadrant and a right inguinal mass. Clinical laboratory studies indicated leukocytosis (white blood cell count, 10270/mm$^3$). Although an intravenous painkiller and fluid therapy were administered, his right lower quadrant pain worsened. Abdominal radiography showed nonspecific distribution of bowel gas without any sign of bowel obstruction. Abdominal CT was performed using a 64-channel multi-detector CT system (Aquilion; Toshiba, Tokyo,

Japan), and the contrast medium used was Iohexol (IO-Brix; Taejoon Pharm, Seoul, Korea). CT examination revealed a 3.5 × 2.2 × 3.8 cm fatty mass with central soft-tissue attenuation and a peripheral halo in the right lower quadrant over the right lateral aspect of the sigmoid colon (Fig. 1A). The mass did not show a whirling pattern. A part of the fatty structure was found to extend into the right inguinal hernia sac (Fig. 1B). Bowel herniation, bowel wall thickening, and obstruction were not observed. CT also showed that the appendix was dilated to 10 mm with mild wall thickening. Based on these findings, he was diagnosed with omental infarction secondary to a right inguinal hernia, and he underwent surgery for correction of inguinal hernia and resection of the infarcted omentum.

During surgery, the greater omentum was found to be twisted several times between the level of the sigmoid colon and the right inguinal canal (Fig. 1E). Infarction was noted in the proximal portion of the twisted omentum. Therefore, laparoscopic partial omentectomy (Fig. 1F) and herniorrhaphy were performed. Pathology examination indicated necrosis and hemorrhage in the resected omentum. We also resected the appendix,

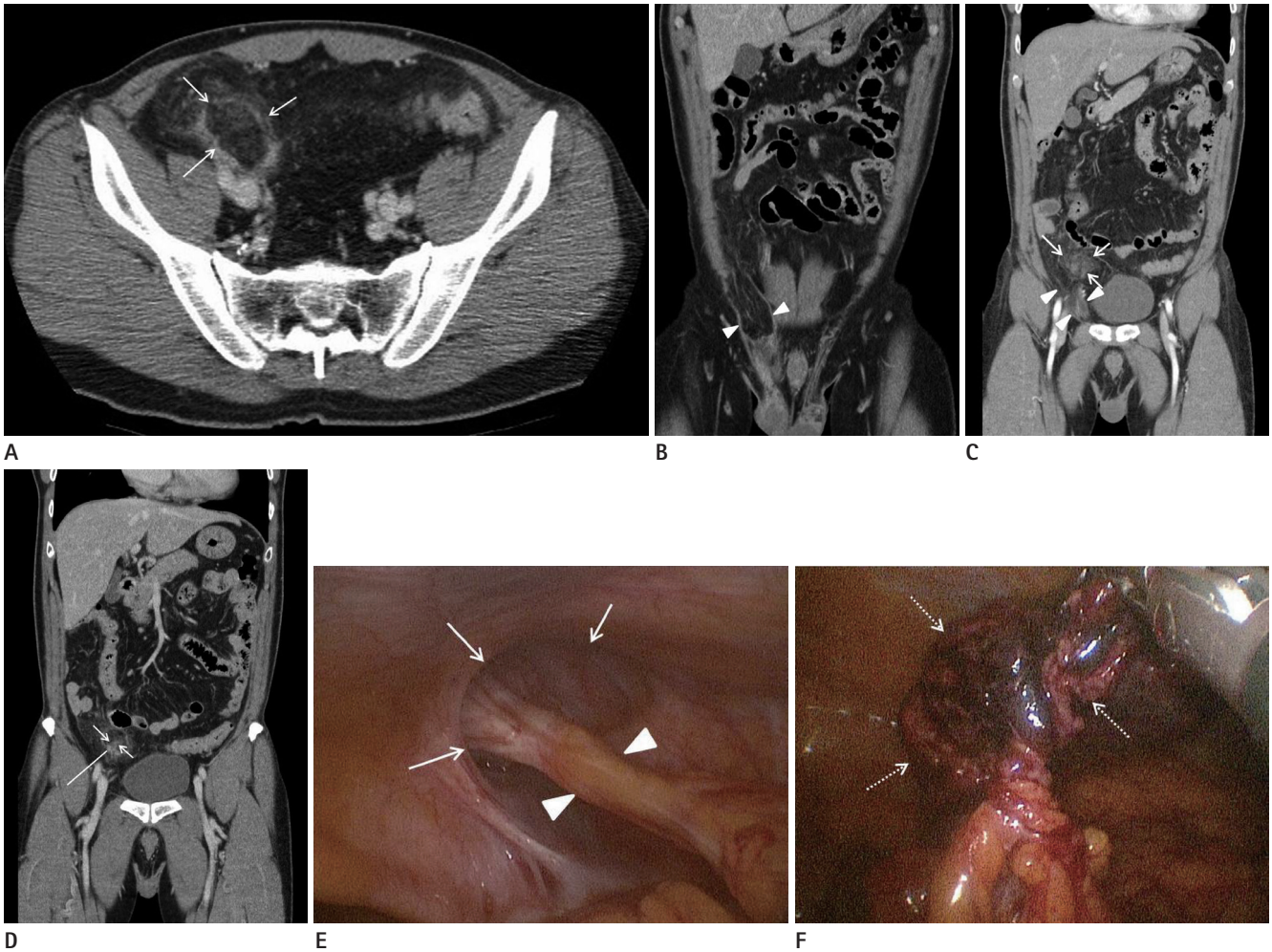


**Fig. 1.** A 59-year-old man with omental infarction due to secondary omental torsion associated with an untreated inguinal hernia.
**A.** Axial CT scan shows a fatty mass (arrows) with central soft-tissue attenuation and a peripheral halo in the right lower quadrant, adjacent to the sigmoid colon.
**B–D.** On Coronal CT scan **(B)**, a part of the fatty structure extends into the right inguinal hernia sac (arrowheads). The proximal portion of the herniated fatty structure (arrowheads) and the proximal portion of the omental torsion (arrows) are seen **(C)**. A small dot-like soft tissue structure (line) which is suspected to be the torsion knot is noted in the juxta-proximal portion of the herniated omentum with distended venous structure extending into the ovoid-shaped mass with surrounding fat infiltration (arrows) **(D)**.
**E, F.** Laparoscopic finding of the inguinal hernia and infarcted omentum. Defect in the right external inguinal ring (arrows) was found and the greater omentum (arrowheads) entered into the inguinal hernia site **(E)** and the infarcted omentum (dotted arrows), proximal to the twisted part **(F)**, was seen during surgery.

and the pathology examination shows appendiceal mucocele. The postoperative course was uneventful, and he was discharged from the hospital 2 days after surgery.

## DISCUSSION

Omental torsion is a rare cause of acute abdominal pain. It usually affects the right side of the omentum, because the right side is longer, more mobile, and less richly vascularized with poor collateralization than the left side (2).

Omental torsion can be classified as primary or secondary torsion, and the latter condition is more common. Primary omental torsion is associated with local omental anomalies, such as a bulky, bifid, and accessory omentum, or with abnormally redundant omental veins. Secondary omental torsion is associated with an inguinal hernia (most common), adhesions to cysts, tumors, inflammatory foci, scars, or internal or external herniation. In both types of torsion, the precipitating factors are similar and include either a sudden increase in the intra-abdominal pressure due to exertion, coughing, or sneezing; change in body position; or occupation-related vibrating tools. These events may cause a sudden shift of the omentum, which may result in torsion (3, 4). Omental torsion can also be divided into "unipolar" and "bipolar." In cases of unipolar omental torsion, the proximal omentum remains fixed, and the other tongues are free. In cases of bipolar omental torsion, the proximal and distal omenta are fixed (5). In our patient, complete torsion of the greater omentum was noted with necrosis secondary to its presence in a right inguinal hernia. Torsion of the greater omentum occurs in the juxta-proximal portion of the herniated omentum (Fig. 1C, D) and this finding was confirmed with laparoscopic surgery (Fig. 1F). With these CT and surgical findings, our case is verified to be of bipolar omental torsion.

Omental infarction occurs owing to its rotation in the transverse plane, which may cause vascular compromise with strangulation, necrosis, or infarction (6). Omental torsion is a rare cause of omental infarction, and it has been reported that torsion occurs when a portion of the omentum twists upon itself, leading to vascular compromise (7).

As omental torsion and infarction most frequently affect the right side of the omentum, both these conditions can mimic other common causes of acute surgical abdomen, such as acute appendicitis, diverticulitis, ovarian cysts, acute cholecystitis, and perforated peptic ulcers.

Omental torsion and infarction are rarely diagnosed preoperatively; however, preoperative diagnosis of these conditions is becoming more frequent with the increasing use of CT for the diagnosis of acute abdominal conditions (8). A fatty mass with a whirling pattern in the greater omentum has been reported to be a typical CT finding of omental torsion. However, this characteristic appearance is not observed in all patients with omental torsion. It has been reported that the whirling pattern may not be apparent in cases in which the axis of rotation is not perpendicular to the transverse scanning plane. Instead, there are concentric circular lines within the mass secondary to the torted vascular structures, which comprise the whirl sign (9). These findings were also found in our case (Fig. 1D), and it was helpful to diagnose omental torsion.

Omental infarction demonstrates a variety of findings on CT. Commonly, it appears as a solitary, well-defined, triangular or ovoid mass between the abdominal wall and the transverse or ascending colon, with a heterogeneous and sometimes whorled pattern of linear fat strands, and fat infiltration may be present around the infarction (10). In our case, we could observe most of the findings of omental infarction mentioned above (Fig. 1D).

The association between omental torsion and inguinal hernia has been mentioned in previous reports; however, to the best of our knowledge, this is a rare case of omental infarction associated with both inguinal hernia and omental torsion.

In conclusion, omental torsion and infarction are rare causes of acute abdominal pain; however, they should be included in the differential diagnosis of acute abdomen, especially in patients with an untreated inguinal hernia. In some cases of suspected omental torsion, contrast-enhanced abdominal CT can be helpful for making the diagnosis.

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## 우측 서혜부 탈장과 동반된 대망염전과 대망경색: 증례 보고

김유성* · 김태형

대망염전과 대망경색은 급성복부통증을 유발하는 드문 원인으로 수술 전 진단이 어렵다. 최근 이들의 진단에 전산화단층촬영술이 유용하다는 일부 보고가 있다. 우리는 치료하지 않은 서혜부 탈장과 동반된 대망염전을 보인 59세 남자 환자의 증례를 보고하고자 한다. 수술 전 전산화단층촬영 소견에서 우측 하복부의 지방 종괴와 우측 서혜부 탈장이 확인되었다. 위 환자는 부분적 대망절제술 및 탈장봉합술을 시행받았고, 수술 후 특별한 부작용은 나타나지 않았다.

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