



Omental Infarction Associated with Rib Cage Anomaly in Achondroplasia: Report of a Rare Case

늑골 기형이 동반된 연골무형성증 환자에게서 발생한 대망 경색: 드문 증례 보고

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Omental infarction, a rare cause of acute abdominal pain, is usually difficult to diagnose before surgery. Several studies have shown that CT is useful in diagnosing an omental infarction. We report the first case of an omental infarction secondary to rib cage anomaly associated with achondroplasia. Preoperative CT revealed a fatty mass in the anterior perihepatic space and anterior flaring of the ribs. The patient, a 41-year-old man, was diagnosed with omental infarction in the anterior perihepatic space and treated with intravenous painkillers. After discharge, because of recurrent abdominal pain, he was readmitted and successfully underwent laparoscopic partial omentectomy. The mass was confirmed to be an infarcted omentum with fat necrosis and hemorrhage. Thus, omental infarction should be considered as a differential diagnosis for acute abdominal pain, especially in patients with achondroplasia. Contrast-enhanced abdominal CT can help in correctly diagnosing a suspected omental infarction.

Index terms Omentum; Infarction; Acute Abdomen; Computed Tomography, X-Ray; Achondroplasia

INTRODUCTION

Omental infarction rarely causes acute abdominal pain. On contrast-enhanced CT of the abdomen, omental infarction presents as a well-defined solitary ovoid or triangular fatty mass adjacent to the large bowel loops, with whorled patterns of the heterogeneous or linear fat strands, and fat infiltration can be seen around the infarction (1, 2). A whorled vascular pedicle may also be identified. Even though omental infarction is seldom diagnosed preoperatively, awareness of this condition is important to clinicians and radiologists because it can easily mimic the common causes of acute abdominal

Received November 13, 2018

Revised January 9, 2019

Accepted January 23, 2019

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pain that need surgical treatment.

We report the first case of a surgically and histopathologically proven omental infarction associated with rib cage anomaly in an achondroplasia patient, which was diagnosed by pre-operative CT.

CASE REPORT

A 41-year-old man visited our emergency department with acute abdominal pain which had started 5 days ago in the right upper quadrant. He had been diagnosed with achondroplasia and had no other associated symptoms. His vital signs were immediately assessed and were in the normal range. Physical examination showed tenderness at the right upper quadrant without definite Murphy's sign. Clinical laboratory examination showed increased erythrocyte sedimentation rate (28 mm/hr) and C-reactive protein (1.5 mg/dL).

Abdominal radiography showed a nonspecific distribution of bowel gas. Abdominal CT was performed immediately. The CT examination revealed a $4.2 \times 1.4 \times 4.4$ cm fatty mass with central mixed soft-tissue attenuation in the anterior aspect of the liver, IV and VIII segments (Fig. 1A, B). Both ribs of the patient showed anterior flaring, which formed a space in the anterior perihepatic space for omentum to be caught in. The CT also showed an ill-defined arterial enhancing lesion and indentation at the adjacent liver parenchyma. Based on these findings, he was diagnosed with omental infarction in the anterior perihepatic space. After applying fluid therapy with an intravenous painkiller, the pain in his right upper quadrant improved. After discharge from our hospital, he complained of recurrent abdominal pain and decided to undergo surgical resection. Two weeks later, he underwent surgery for resection of the infarcted omentum.

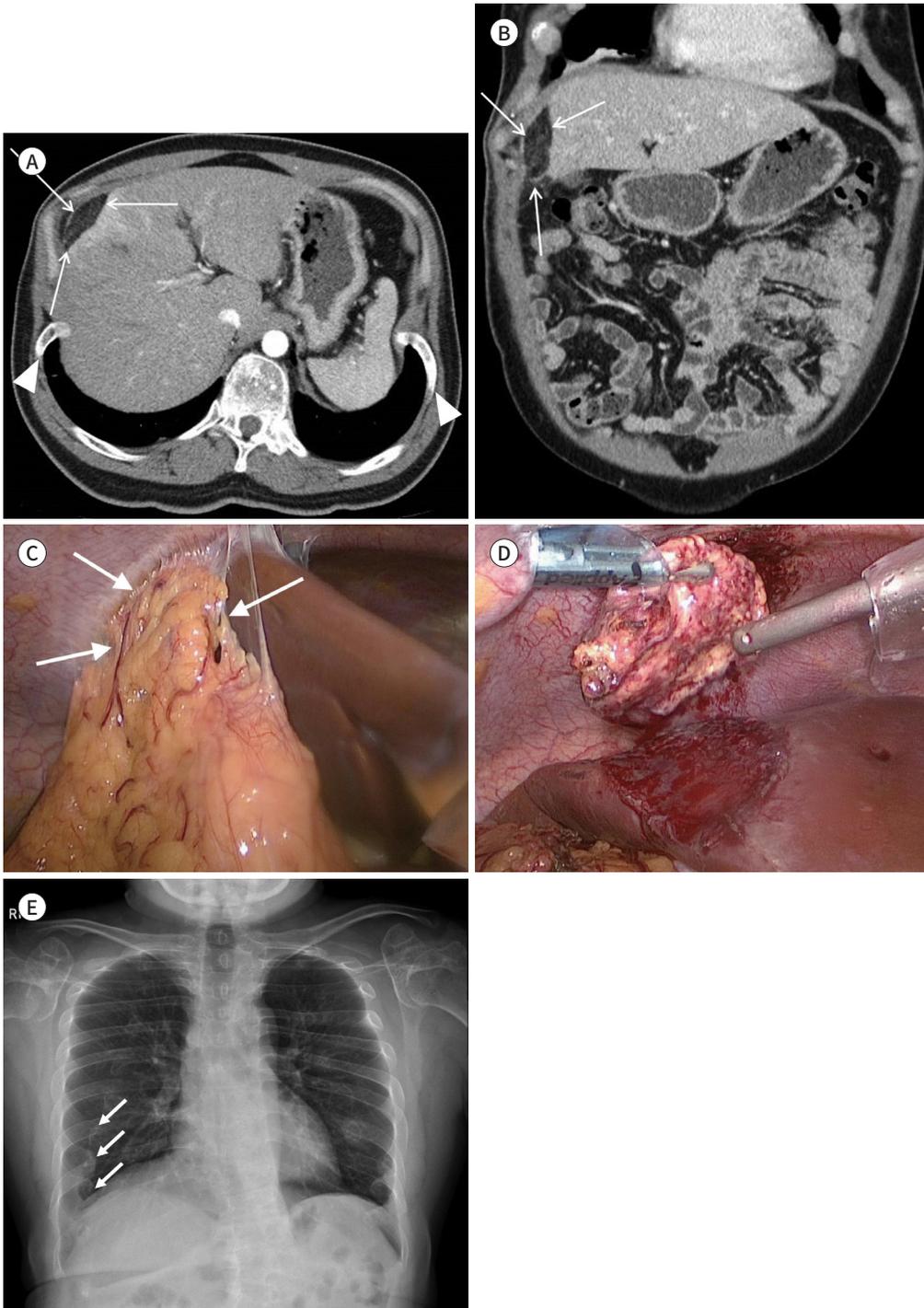
During surgery, the greater omentum was found between the anterior abdominal wall and the liver surface. The trapped segment was grossly necrotic and had adhered to the abdominal wall and the adjacent liver surface (Fig. 1C, D). Therefore, laparoscopic partial omentectomy was performed and the pathological results showed necrosis and hemorrhage in the resected omentum. There was no specific event after surgery, and he was discharged from the hospital 2 days postoperatively.

DISCUSSION

Achondroplasia is the most common form of short-limb dwarfism in humans. The clinical features of achondroplasia are so distinctive that they can be easily identified clinically and radiologically at birth, as well as later in life (3). Achondroplasia patients usually have a small chest in the thorax. The ribs are short and wide with concavity at the ends (4). This anomaly is also described as shortening and anterior flaring of ribs, which is shown in our patient's chest radiograph (Fig. 1E).

Omental infarction is an uncommon, but important, cause of acute abdominal pain, which often imitates other surgical conditions. It may be classed as primary which has no identifiable etiology, or secondary with other existing intra-abdominal causes (5, 6). Despite the classification, similar histopathological changes, involving edema and congestion due to

Fig. 1. Omental infarction in a 41-year-old achondroplasia patient, complaining with acute abdominal pain. **A-E.** Axial (**A**) and coronal (**B**) CT scans show a fatty mass (arrows) with central mixed soft-tissue attenuation in the anterior aspect of the liver (segments IV and VIII). CT scans also show an ill-defined arterial-enhancing lesion and indentation at the adjacent liver parenchyma. The axial (**A**) CT scan also shows anterior flaring of both ribs (arrowheads). The intraoperative image (**C**) shows the greater omentum found between the anterior abdominal wall and liver surface; the trapped segment is grossly necrotic and is adhered to the abdominal wall and adjacent liver surface (arrows). The surgeon successfully resected the trapped and infarcted omentum and controlled liver surface bleeding with argon plasma coagulation (**D**). The posteroanterior chest radiograph (**E**) shows shortening of anterior ribs and anteriorly flared ribs (arrows). A horizontal arrangement of rib is also seen, probably due to kyphoscoliosis, which is accompanied by achondroplasia.



venous stasis and thrombosis, progresses to hemorrhagic necrosis, which leads to extravasation of serosanguineous peritoneal fluid (7, 8).

In our case, the patient was diagnosed with achondroplasia, and he showed anterior flaring of both ribs on chest radiograph and CT. We assume that the anterior flaring of the ribs made space between the anterior abdominal wall and the anterior surface of the liver, and interposition of the omentum occurred due to this free space. This looked similar to the pathophysiology of Chilaiditi sign, which is characterized by colonic interposition between the liver and the diaphragm. Hepatic, intestinal, and/or diaphragmatic etiologies contribute to the pathogenesis of Chilaiditi sign. Variations in normal anatomy or an existing anatomical anomaly can lead to the pathological interposition of the colon (9). We also think that this trapped omentum underwent a similar pathology of omental infarction which mentioned above. Considering the pathophysiology of omental infarction, we expected that the omentum would easily get caught in the free space if the entrance was narrow.

To our knowledge, our report is the first case of an omental infarction associated with rib cage anomaly in an achondroplasia patient, which correlates with both radiological and histopathological findings. The management of omental torsion is debatable. Some authors support conservative management, whereas others advocate that surgical treatment is advantageous, especially considering the advanced laparoscopic technologies (10). Our patient's symptoms improved immediately with painkillers via intravenous fluid therapy, so he wanted to observe the progress. Finally, he decided to have surgical resection due to recurrent severe abdominal pain despite the use of oral analgesic.

In conclusion, although omental infarction is a rare cause of acute abdominal pain, it should be considered as one of the differential diagnoses for acute abdomen, especially in patients with achondroplasia. In some cases of suspected omental infarction, contrast-enhanced abdominal CT can assist in the diagnosis.

Conflicts of Interest

The authors have no potential conflicts of interest to disclose.

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늑골 기형이 동반된 연골무형성증 환자에게서 발생한 대망 경색: 드문 증례 보고

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대망 경색은 급성 복통의 드문 원인 중 하나로, 수술 전 진단이 어렵다. 이전의 여러 연구를 통해 컴퓨터단층촬영(CT)이 대망 경색을 진단하는 데 유용하다는 것이 알려져 있다. 저자들은 늑골 기형이 동반된 연골무형성증을 진단받은 41세 남자 환자에게서 발생한 속발성 대망 경색을 보고하고자 한다. 환자는 급성 복통을 주소로 응급실 방문 후 시행한 조영증강 CT에서 그물막 경색을 진단받았다. 환자는 통증 조절 후 귀가하였으나, 통증이 지속되어 재내원하여 수술적 제거를 시행하였고 최종 병리검사에서 확진되었다. 드문 원인인기는 하지만 급성 복통을 호소하는 환자, 특히 연골무형성증이 있는 환자에게서 대망 경색을 감별진단 중 하나로 고려해야 한다는 점과, 조영증강 CT가 대망 경색을 정확히 진단하는 데 도움이 될 수 있다는 점을 함께 보고하고자 한다.

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