CASE REPORT

Left-sided omental infarction: a rare cause of abdominal pain, discovered by CT scan

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SUMMARY

Omental infarction in adults is a rarely occurring phenomenon, with left-sided omental infarction being even more seldom. The importance of this case report lies in raising awareness of the diagnosis omental infarction as a cause of acute abdomen among doctors who work in the emergency department, in order to prevent unnecessary surgical interventions as conservative treatment generally solves the problem. Omental infarction is the result of vascular obstruction and ends in tissue ischaemia. Because of the rich vasculature of the greater omentum, anastomoses reorganise the vascularisation, which explains the mostly benign course of omental infarction. By adding omental infarction to the list of differential diagnoses in patients who present with acute abdominal pain, future management of patients with an acute abdomen can be adjusted for the optimal approach to not overlook any surgery-requiring diagnosis as well as to prevent overtreatment.

BACKGROUND

Acute abdominal pain is a common problem in patients who visit the emergency department (ED) as approximately 4%–6% of ED patients report this problem as main complaint.^{1 2} Of these patients, 10% has an acute abdomen: acute onset of abdominal pain for which emergency surgery is often required, and which is mostly the result of abdominal inflammation, ischaemia or perforation.^{3 4} The most common causes of acute abdomen are acute appendicitis (14%), bowel obstruction (13%), urinary tract disorders (9%), acute diverticulitis (8%) and cholecystitis (5%).¹

Making a correct diagnosis is a constant challenge for ED doctors who aim to prevent unnecessary surgical interventions without missing diagnoses that need to be treated surgically without delay. Imaging is often necessary to establish a correct diagnosis, and imaging with CT has proven very useful in the management of acute abdominal pain.¹

Infarction of the greater omentum is a rare cause of acute abdomen. Up until now, approximately 400 patients with omental infarction have been published.⁵ Patients with omental infarction often present with pain in their right lower or upper abdominal quadrant, which is the main reason why they are misdiagnosed with appendicitis, cholecystitis or right-sided diverticulitis. The most common symptoms of omental infarction are non-specific: acute abdominal pain in the right lower quadrant, anorexia, nausea, vomiting, diarrhoea and fever.

Laboratory tests are non-specific as well: elevated leucocytes and slightly elevated levels of C reactive protein (CRP).⁶ Therefore, omental infarction cannot be distinguished from other diagnoses without the help of imaging techniques. As treatment of omental infarction can often be conservative, making this diagnosis is important to avoid unnecessary surgery.

The characteristic signs of omental infarction at CT are a well-circumscribed, non-enhancing, fatty mass with heterogeneous attenuation and focal fat stranding surrounding the lesion. This mass is usually situated between the colon and the anterior abdominal wall, usually in the right lower quadrant and is usually larger than 5 cm.⁷

In most cases, omental infarction is caused by rotation or torsion of the omentum, which in turn induces strangulation and obstruction of vessels, and eventually leads to omental necrosis with or without inflammation. Primary torsions are caused by malformations or congenital omental vascular anomalies.^{5 8 9} More frequently, however, secondary torsions are seen and these are associated with previous laparotomy, attachment of the omental tissue to tumours, presence of intra-abdominal scar tissue, cysts or intra-abdominal inflammation. Omental infarction without torsion can be induced by abdominal trauma, mesenteric artery occlusion, obesity or congestive heart failure.^{10 11}

Both primary and secondary omental torsion result in venous stasis, followed by formation of an omental thromboembolism, which may lead to omental infarction. Subsequently, omental fat oedema and congestion develop, which lead to haemorrhagic necrosis of abdominal fat and extravasation of peritoneal fluid.¹² Omental infarction is, however, a rare phenomenon, because multiple intra-abdominal collateral arteries are present, and only when these collaterals are not functioning properly, infarction develops.¹³ When the collaterals are able to reorganise the omental blood supply, conservative treatment will in most cases be successful.

CASE PRESENTATION

An 81-year-old woman was referred to our ED with complaints of 3 days persisting, acutely developed worsening pain at the left lower quadrant of her abdomen. The pain was of lancinating, non-colic character, which aggravated by movement. She had experienced some minimal bright red rectal blood loss during the preceding days, just as she had during the preceding year, but she never noticed melena.

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Figure 1 CT scan ((A) transversal, (B) sagittal) showing arrows pointing at indurated fat adjacent to the abdominal wall.

She had no fever, cold shivers, nausea, vomiting nor changes in micturition or bowel movements. Her medical history included hypertension, hypercholesterolaemia and a uterus extirpation long ago.

INVESTIGATIONS

Physical examination revealed a blood pressure of 185/80 mm Hg and a regular pulse of 65 beats per minute. Her body temperature was 37.0°C and her body mass index was 30.1 kg/m². Auscultation of the abdomen revealed normal bowel sounds, but soft pressure of the stethoscope caused worsening of the abdominal pain and we noticed some muscular guarding. There was no pain in the kidney areas. Rectal examination was normal, except for some skin tags.

Laboratory studies showed a haemoglobin of 8.4 mmol/L (normal range: 7.5–10 mmol/L), a white cell count of $8.5 \times 10^9/L$ (normal range: $4.0\text{--}10.0 \times 10^9/L$) and a slightly elevated CRP of 22 mg/L (normal range <10 mg/L) and lactate dehydrogenase of 273 U/L (normal range: 135–225 U/L). The remaining blood values were normal. The ECG showed a normal sinus rhythm, without any abnormalities in conduction or repolarisation.

Ultrasound showed some induration of the intra-abdominal fat adjacent to the anterior abdominal wall at the painful location. This induration was difficult to evaluate because of the patients' habitus, and therefore, a CT scan was made (figure 1). This scan showed an area of slightly heterogeneous fatty tissue with a maximum diameter of 4.7 cm, which was surrounded by some fat stranding in the left ventral margin near the ventral abdominal wall. The nearby descending colon and sigmoid showed some diverticula, but the area of fat stranding was not directly adjacent to the bowel nor to the diverticula, and more adjacent to the abdominal wall. Therefore, the diagnosis of omental infarction was favoured over epiploic appendagitis.

DIFFERENTIAL DIAGNOSIS

Composing a differential diagnosis is one of the first goals when a patient presents at the ED with acute abdominal pain. A diagnostic tool that can distinguish between the top differential diagnoses is the CT scan.¹⁴ In our patient, the CT scan showed omental fat stranding nearby the sigmoid and descending colon. These structures showed a few diverticula, but the fat induration was not typically located around these

diverticula, which excluded the diagnosis of acute diverticulitis.¹⁵ No intra-abdominal free air was seen, which excluded abdominal perforation. A normal appendiceal lumen and wall, without fat stranding around the appendix, excluded acute appendicitis. In addition, there were no signs of acute cholecystitis.^{12 16} In addition, epiploic appendagitis was considered, but since there was no direct connection to the bowel wall, this diagnosis was judged unlikely.

TREATMENT

Since omental infarction seems to be a self-limiting condition as conservative treatment was reported to be successful, we choose to treat the patient conservatively.^{5 17} We prescribed analgesics and planned outpatient clinic appointments after 4 days and again after 4 weeks.

OUTCOME AND FOLLOW-UP

At the outpatient clinics, she reported that within 3 days, she was completely free of complaints and her LDH levels returned to normal again. The left-sided omental infarction that occurred in this patient turned out to be idiopathic. Our patient had no recent laparotomies and no (vascular) malformations were seen at CT.

DISCUSSION

The use of imaging techniques for the work-up of acute abdomen is important for excluding other causes of acute abdominal pain. The CT scan resulted in the diagnosis of a benign, self-limiting condition in our patient, which in turn avoided an unnecessary surgical intervention.

A review of the literature shows a disunity between authors regarding the designated treatment of omental infarction. Arguments in favour of conservative medical management are the often self-resolving character of omental infarction, especially since omental infarction is described to be self-limiting (proven with CT) even after 1–3 years follow-up, as well as the safety and effectiveness of conservative treatment, which protects patients from unnecessary surgical intervention.^{18 19} Arguments in favour of surgical intervention are a shorter length of hospitalisation compared with conservative treatment (2 vs 4 days), which will be supported by patients and will save money. In addition, (laparoscopic) treatment is favoured by some because it allows for

confirmation of the radiological findings. In conclusion, non-operative management, which includes analgesics, is recommended in patients who present early in the course of their illness. Intervention is required when the patient's condition worsens or when there are doubts on the diagnosis.²⁰

A slightly elevated level of LDH was found in our patient, which can be explained by the tissue damage matching with the omental infarction and accompanying cell death leading to release of LDH from the cells. However, this finding has not been described in the literature on this topic.

Learning points

- ▶ Omental infarction should be included in the list of differential diagnoses in patients with acute abdominal pain.
- ▶ Although omental infarction is a rare condition, left-sided omental infarction is even more seldom.
- ▶ Diagnosing omental infarction with its benign and usually self-limiting course is important in preventing unnecessary surgical interventions.
- ▶ For diagnosing omental infarction, using imaging techniques like CT can confirm an omental infarction as well as exclude differential diagnoses.

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