CASE REPORT

Aortoduodenal syndrome in a patient receiving maintenance haemodialysis

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SUMMARY

An 83-year-old man receiving maintenance haemodialysis presented with abdominal pain, fever and emesis. He was initially diagnosed with acute cholecystitis. His pain and fever improved with fasting and antibiotics, but he continued to suffer from anorexia and emesis. Enhanced abdominal CT scan showed evidence of superior mesenteric artery (SMA) syndrome versus obstruction of the third part of the duodenum caused by abdominal aortic aneurysm (AAA), the so-called aortoduodenal syndrome. An upper gastrointestinal contrast study revealed duodenal dilation and blockage of the third part of the duodenum. The AAA continued to enlarge over the subsequent 3 months and the intra-abdominal visceral fat volume decreased over 1 month. The aortomesenteric angle and distance remained within normal ranges. Ultimately, the patient was diagnosed with aortoduodenal syndrome. In the present case, a duodenal obstruction was caused by the combination of an enlarged AAA and reduced intra-abdominal visceral fat in a patient receiving maintenance haemodialysis.

INVESTIGATIONS

An abdominal CT demonstrated evidence of SMA syndrome versus obstruction of the third part of the duodenum caused by the AAA (figure 1C). An upper gastrointestinal contrast study showed duodenal dilation and obstruction of the third part of the duodenum at the right side of the AAA. The AAA enlarged from 43 to 48 mm over the next 3 months. Moreover, the intra-abdominal visceral fat volume decreased from 52.7% to 46.6% over the next month without weight loss (due to his fixed dry weight setting during haemodialysis). Three-dimensional CT angiography revealed that the aortomesenteric angle was maintained at 51.5° and the aortomesenteric distance was stable at approximately 12 mm (figure 2A–C). Because of these findings, the patient was diagnosed with aortoduodenal syndrome rather than SMA syndrome.

TREATMENT

The patient underwent cholecystectomy, T-tube drainage for residual common bile duct stones and palliative gastrojejunostomy.

BACKGROUND

Duodenal obstruction caused by an abdominal aortic aneurysm (AAA) is a rare clinical entity and causes a clinical syndrome consisting of postprandial epigastric pain, nausea, vomiting, anorexia and weight loss.^{1–4} Aortoduodenal syndrome is one cause of duodenal obstruction. The mechanism of obstruction is thought to be direct compression of the duodenum by aneurysmal pressure against the abdominal wall or the superior mesenteric artery (SMA).¹ We report a case of aortoduodenal syndrome in a patient receiving maintenance haemodialysis.

CASE PRESENTATION

An 83-year-old man with chronic renal failure due to nephrosclerosis, who was receiving haemodialysis three times a week, presented with abdominal pain, fever and bilious vomiting. He had a medical history significant for myocardial infarction status postpercutaneous coronary intervention, hypertension, chronic hepatitis B, cholelithiasis and AAA (figure 1A). He was diagnosed with acute cholecystitis based on his clinical examination and radiographic imaging (figure 1B). His pain and fever improved with fasting and antibiotics, but he continued to suffer from anorexia and bilious vomiting.

OUTCOME AND FOLLOW-UP

Surgical intervention eliminated the patient's emesis but he remained anorexic. A postoperative upper gastrointestinal contrast study demonstrated that, although contrast passed smoothly through the efferent loop, the duodenal dilation remained (figure 3). A follow-up CT 1 month after surgery showed that the AAA had enlarged from 48 to 55 mm and the duodenal dilation had worsened (figure 1D). The patient died of acute heart failure secondary to ventricular fibrillation on postoperative day 69.

DISCUSSION

SMA syndrome is caused by a low aortomesenteric angle resulting in vascular compression of the third part of the duodenum.^{5–7} It has been reported that an aortomesenteric angle of less than 25° and a distance of less than 8 mm correlates with SMA symptoms.^{6, 8} In our patient, the aortomesenteric angle was 51.5° and the aortomesenteric distance was approximately 12 mm. A contrast study revealed that the obstruction was present at the right edge of the AAA. The patient was thus diagnosed with aortoduodenal syndrome but not SMA syndrome. It is important to distinguish between aortoduodenal and SMA syndromes, given their similar clinical presentation, because each syndrome has a different therapeutic strategy.

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Figure 1 Time series of abdominal CT images (arrowhead indicates the duodenum). No duodenal dilation was observed on images obtained 3 months prior to symptom onset (data not shown) (A). Mild duodenal dilation at the onset of acute cholecystitis (B). Duodenal dilation before surgery (C). Worsened duodenal dilation 1 month after surgery (D).

Figure 2 Aortomesenteric angle (A) and distance (B). The lateral (C) and frontal (D) views of three-dimensional CT angiography.

Figure 3 Postoperative contrast study via T-tube. Postoperatively, the duodenal dilation remained and contrast medium returned to the stomach on stomach decompression.

In the present case, the duodenal obstruction was caused by a combination of enlarged AAA and reduced intra-abdominal visceral fat. Owing to the presenting symptoms of emesis and anorexia and the finding of gallstones on imaging, the patient was initially diagnosed with acute cholecystitis. Although the first abdominal CT scan showed mild duodenal dilation, this was thought to be due to duodenal paresis caused by acute cholecystitis rather than obstruction caused by the AAA. The patient's intra-abdominal visceral fat volume decreased from 52.7% to 46.6% over the next month. However, with the exception of inflammatory markers, there was almost no change in serum markers such as total protein, albumin or electrolytes. Moreover, the patient's body weight remained stable, likely because he continued to be dialysed to his dry weight. Unfortunately, his ongoing haemodialysis may have concealed his underlying physical condition, resulting in a delay in definite diagnosis.

In order to reduce surgical stress and shorten the operative time in our high-risk patient, we performed a palliative gastrojejunostomy for aortoduodenal syndrome. Although there was a report of endovascular aneurysm repair (EVAR) for aortoduodenal syndrome, we did not consider EVAR as an aneurysmal sac depressurisation because AAA in the present case was large, with marked calcification and suspected shaggy aorta, and we believe the application of EVAR for aortoduodenal syndrome remains to be well established.^{9–11} The patient's postoperative course had an unfavourable short-term outcome; despite improvement in his emesis he had persistent anorexia, necessitating the continuous administration of intravenous fluids. Previous reports have found a high failure rate of gastrointestinal bypass for duodenal obstruction caused by AAA.² Although the surgical risk was deemed too high in our patient, he might have benefited from direct AAA repair, as this has been

shown to result in good outcomes.^{2–4} In the case of SMA syndrome, duodenojejunostomy has been recommended; the success rate of this procedure has been reported to be 80–90%.^{6 7 12–15} Our patient might have benefited from duodenojejunostomy for gastric decompression and also for complete release of the duodenal obstruction.^{7 15}

In conclusion, our experience indicates that aortoduodenal syndrome should be taken into consideration in haemodialysis patients with a known AAA who present with bilious emesis and anorexia. Additionally, curative aortic surgery should be performed in patients with aortoduodenal syndrome, if possible.

Learning points

- ▶ Aortoduodenal syndrome is a rare clinical entity.
- ▶ Aortoduodenal syndrome should be taken into consideration in haemodialysis patients with a known abdominal aortic aneurysm who present with bilious emesis and anorexia.
- ▶ Haemodialysis may conceal underlying physical conditions and can lead to a delay in the diagnosis of aortoduodenal syndrome.
- ▶ If possible, curative aortic surgery should be performed in patients with aortoduodenal syndrome.

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Competing interests None.

Patient consent Obtained.

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