

CASE REPORT

Coil Migration to the Duodenum 1 Year Following Embolisation of a Ruptured Giant Common Hepatic Artery Aneurysm

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Introduction: Transcatheter arterial embolisation is often performed for the treatment of visceral artery aneurysms. Here, the case of a patient who developed the rare complication of coil migration into the intestinal tract is reported, and a review of the literature is presented.

Case report: A 30 year old woman with a ruptured giant common hepatic artery aneurysm, who had been treated with transarterial coil embolisation 1 year previously, was admitted to hospital complaining of passing the coils on defecation. Abdominal Xray and gastroscopy showed the migration of the coils through a duodenal fistula. Open repair was performed with the coils successfully removed and the duodenal fistula closed with omentopexy. At the 3 year follow up, there were no signs or symptoms of complications.

Conclusion: Based on observations from this case, although coil migration to the intestinal tract is exceedingly rare, aneurysm rupture with enteric fistula can lead to coil migration.

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INTRODUCTION

Hepatic artery aneurysm (HAA) is the second most common splanchnic aneurysm. It is associated with high morbidity and mortality because of the high risk of rupture, with most patients being asymptomatic before rupture.¹ Treatment options include transarterial embolisation (TAE), reconstructive surgery, and ligation depending on the size and location of the aneurysm. Coil migration is a rare, late complication of TAE. Only seven cases of coil migration to the gastrointestinal tract after TAE of an aneurysm or pseudoaneurysm have been reported.^{2–8} The case of a patient who developed coil migration to the duodenum via a fistula 1 year following TAE of a ruptured giant common hepatic artery aneurysm (CHAA) is presented. The patient consented to the publication of this report.

CASE REPORT

A 30 year old woman was referred to hospital with a giant CHAA 1 year earlier. She had previously complained of epigastric pain. A previous physician performed an upper gastrointestinal endoscopy that revealed no abnormal

findings. Computed tomography (CT) showed a 6 cm CHAA and dissection of the coeliac artery (Fig. 1). Laboratory tests were normal. Autoimmune and connective tissue diseases were not suspected. Radical treatment of the visceral aneurysm required an upper gastrointestinal tract approach because the giant CHAA was close to the duodenum and pancreas. On admission, the epigastric pain disappeared and further detailed examination was planned. Two days following admission, massive haematemesis occurred and the patient developed shock. Emergency CT revealed an increase in the diameter and rupture of the aneurysm into the duodenum. Since TAE can achieve haemostasis more swiftly than the surgical approach, it was selected in this case to provide immediate haemostasis despite the young age of the patient. Angiography was performed under local anaesthesia via the right femoral artery. During angiography of the common hepatic artery, only the left hepatic artery (HA) arose from the aneurysm (Fig. 2A). The right HA was supplied by the right gastroepiploic artery. After selectively catheterising the aneurysm, TAE was performed using isolation techniques and sac packing with the placement of platinum coils in the distal common and left HA, aneurysm sac, and proximal HA. The right HA was not embolised. Finally, the collateral arterial blood supply of the liver was assessed (Fig. 2B). Following TAE the haematemesis resolved. However, upper gastrointestinal endoscopy revealed a CHAA–duodenal fistula (Fig. 3A). The fistula was gradually occluded (Fig. 3B) using proton pump inhibitor and antibiotic infusions. C-reactive protein was maximally

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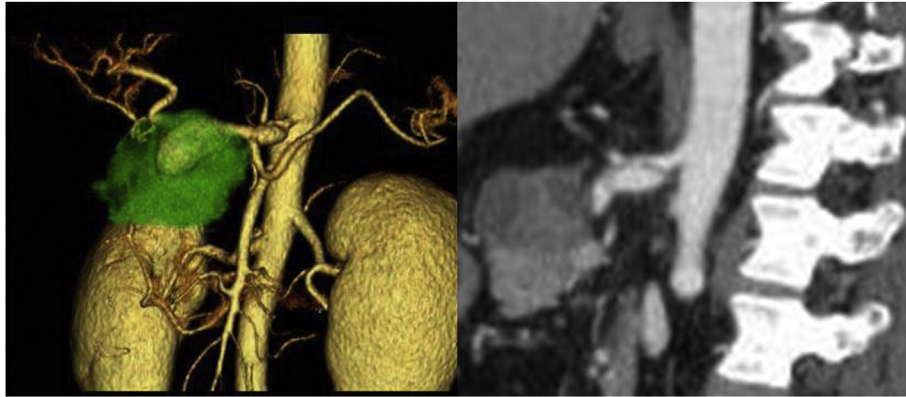


Figure 1. Contrast enhanced computed tomography showing a 6 cm common hepatic artery aneurysm and coeliac artery dissection.

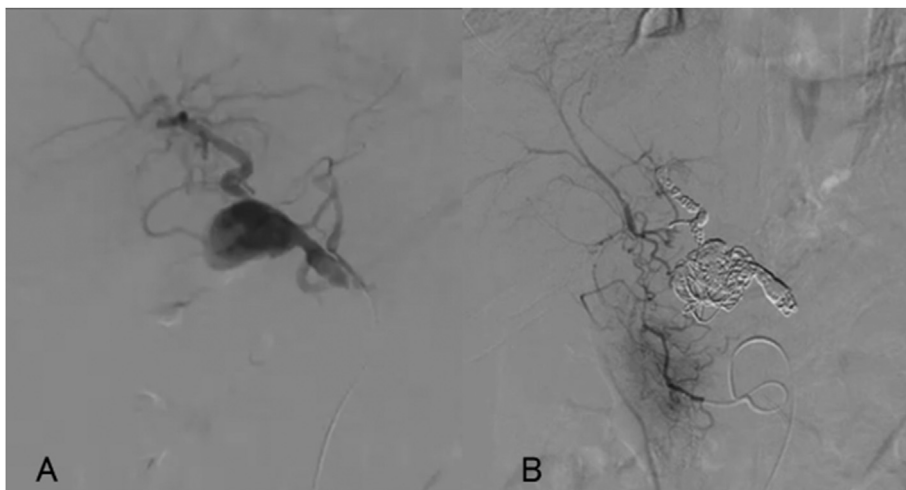


Figure 2. (A) Common hepatic artery angiography showed only left hepatic artery arising from the aneurysm. (B) After TAE, coils were placed into the aneurysm sac, proximal and distal HA. The right hepatic artery was supplied by the right gastroepiploic artery.

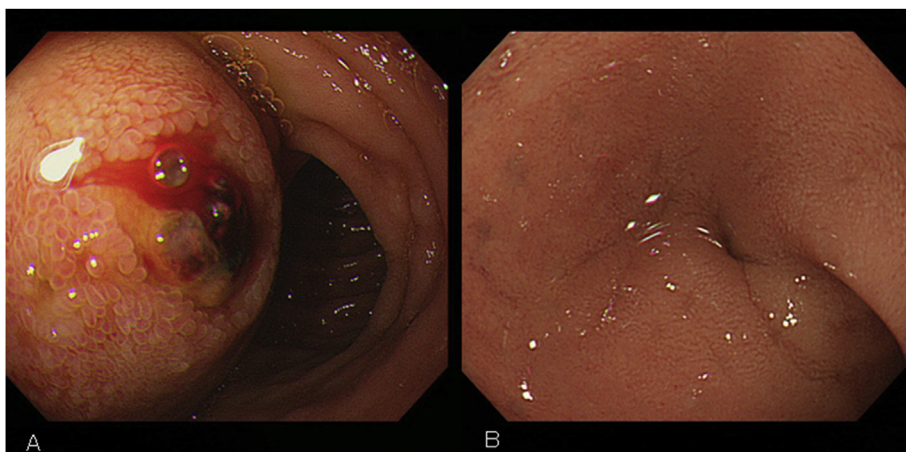


Figure 3. (A) Upper gastrointestinal endoscopy showing a common hepatic artery aneurysm—duodenal fistula following transcatheter arterial embolisation. (B) The fistula and aneurysm gradually shrank by post-operative day 30.

elevated to 7.19 mg/dL; however, its levels were normalised by post-operative day 13. The CHAA sac shrank following embolisation and the fistula developed into a scar that was confirmed several times via gastrointestinal endoscopy. Since there were no findings of infection, radical treatment

was not required. The patient was discharged on post-operative day 30 following an uneventful course.

During outpatient clinical follow ups, no recurrent haematemesis or other complications were observed for up to 1 year. The size of the aneurysm was not measured because

of the use of platinum coils. Later the patient was readmitted to the hospital complaining of passing coils on defecation. Plain abdominal radiography and upper gastrointestinal endoscopy demonstrated that the coils had penetrated the duodenum (Fig. 4). Magnetic resonance angiography showed no blood flow in the aneurysm. Although blood tests were normal, open closure of the fistula at laparotomy was used because of the risk of coil infection. During the operation, severe adhesions were noted around the second part of the duodenum. Only the anterior aneurysm wall could be resected and the coils were removed from the aneurysm and duodenum. Finally, the duodenal fistula was successfully closed using omentopexy. Bacteria were not detected on the removed coils. Post-operative recovery was complicated by an infection of the abdominal wound, which was debrided on day 8. The wound gradually closed, and the patient was discharged on post-operative day 30. At the 3 year follow up, there were no signs or symptoms of complications.

DISCUSSION

The aetiology of HAA is similar to that of other splanchnic aneurysms with 32% due to atherosclerosis, 24% to mediointimal degeneration, 22% to trauma, and 10% to mycosis.¹ HAA has rarely been associated with inflammatory or connective tissue diseases and liver transplantation.⁹ In the present case, the aetiology was suspected to be a dissecting aneurysm because of the presence of coeliac trunk dissection on CT. However, the true histopathology remained unknown and endovascular treatment was selected as first line treatment. During the second open repair, the presence of severe adhesions prevented adequate specimen collection. Recently, TAE has often been performed for the treatment of visceral artery aneurysms. An alternative endovascular treatment in patients with visceral arterial aneurysms is stent grafts. Compared with TAE, using stent grafts can shorten the procedure time, and preserve distal blood flow.¹⁰ However, a limitation of this treatment is that it cannot be employed in the case of small diameter vessels. The most common

complication following TAE is re-bleeding, which requires repeated embolisation or open surgery. However, coil migration is a rare complication. Only seven reports document coil migration into the gastrointestinal tract after TAE of an aneurysm or pseudoaneurysm.²⁻⁸ In four cases, the coils migrated into the stomach,²⁻⁵ one into the rectum,⁶ one into the oesophago-jejunal anastomosis after total gastrectomy,⁷ and one into the sigmoid colon.⁷ The intervals between TAE and coil migration were reported from 3 weeks to 10 years.^{3,4,6} Three cases were asymptomatic, abdominal pain was detected in other three cases, and only one case developed fatal haematemesis. Five cases were reportedly pseudoaneurysms including four splenic artery aneurysms and one gastroduodenal artery aneurysm. Another two cases were true aneurysms including the coeliac artery and internal iliac artery. Radical treatment performed was gastrectomy in two cases.^{2,5} In one case, a splenic artery pseudoaneurysm was recognized after total gastrectomy, and platinum coils were placed in the pseudoaneurysm in- and outflow arteries. Nine months later, the patient developed epigastric pain, and endoscopy showed the coils had migrated into the jejunum. The migrated coils were successfully removed by endoscopic extraction using hot biopsy forceps.⁷ There have been recent reports of endoscopic extraction. The treatment was minimally invasive if there was no infection.^{7,11} Another four cases were treated conservatively, but one case developed fatal haematemesis. In the end, the patient died of recurrent haematemesis, and the autopsy showed abscess formation around the migrated coils.⁴ Causes of coil migration were uncertain. These reports suggest that coil migration is more likely to occur in pseudoaneurysms and aneurysms that are close to the gastrointestinal tract and cases of arterial-enteric fistula. Coil packing of an aneurysm was a risk factor because only the coils that were placed into the aneurysm migrated into the gastrointestinal tract, while those placed into inflow and outflow branch did not.²⁻⁸

In this case, a CHAA duodenal fistula was recognised after TAE. TAE was regarded as temporary haemostasis, and

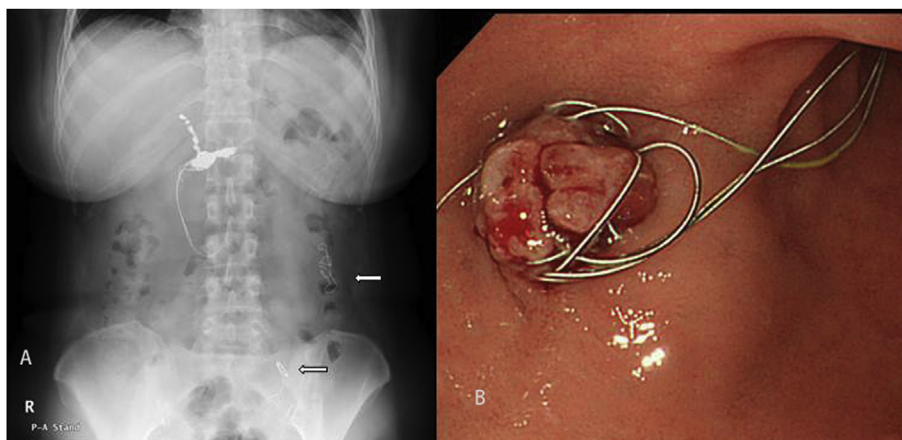


Figure 4. (A) Plain abdominal radiography showing migrated coils in the duodenum and descending and sigmoid colon (arrow). (B) Upper gastrointestinal endoscopy showing the penetration and migration of the coils through the duodenal fistula.

radical therapy should have been performed in the early post-operative period.

CONCLUSION

Although coil migration to the intestinal tract is exceedingly rare, the risk is higher in TAE of ruptured aneurysms with enteric fistula.

CONFLICT OF INTEREST

None.

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