CASE REPORT

Inferior pancreaticoduodenal artery pseudoaneurysm in a patient with calculous cholecystitis: A case report

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Abstract

BACKGROUND
Pancreaticoduodenal artery (PDA) aneurysms are extremely rare. The complicated clinical presentations and high incidence of rupture make it difficult to diagnose and treat. PDA pseudoaneurysms often rupture into the gastrointestinal tract and result in life-threatening gastrointestinal hemorrhage.

CASE SUMMARY
A 69-year-old man was admitted to our hospital due to right upward abdominal pain. A computed tomography (CT) scan demonstrated acute cholecystitis and choledolithiasis. Percutaneous gallbladder drainage was performed subsequently. He was discharged after 3 d and readmitted to hospital for cholecystectomy as arranged 1 mo later. A repeat CT scan revealed an emerging enhancing mass between the pancreatic head and the descending duodenum. Then, he suffered hematochezia and hemorrhagic shock suddenly. Emergency percutaneous angiogram was performed and selective catheterization of the superior mesenteric artery demonstrated a pseudoaneurysm in the inferior PDA. Coil embolization was performed and his clinical condition improved quickly after embolization and blood transfusion. He underwent laparoscopic cholecystectomy and was discharged from hospital after surgery under satisfactory conditions.

CONCLUSION
PDA pseudoaneurysms are uncommon. Acute haemorrhage is a severe complication of pseudoaneurysm with high mortality which clinicians should pay attention to.

Key words: Calculous cholecystitis; Inferior pancreaticoduodenal artery pseudoaneurysm; Gastrointestinal haemorrhage; Coil embolization; Case report
INTRODUCTION
Pancreaticoduodenal artery (PDA) aneurysms are extremely rare, accounting for only 2% of all visceral artery aneurysms[1]. PDA aneurysms are divided into pseudoaneurysms or true aneurysms. PDA pseudoaneurysms have been associated with pancreatitis, abdominal trauma, septic emboli, iatrogenic injuries, penetrating duodenal ulcers, and malignancies[2]. The complicated clinical presentations and high incidence of rupture make it difficult to diagnose and treat. They often rupture into the gastrointestinal tract and result in life-threatening gastrointestinal hemorrhage[3]. Here we report an interesting case of emerging PDA pseudoaneurysm in a patient after percutaneous cholecystostomy.

CASE PRESENTATION

Chief complaints
A 69-year-old man presented to the emergency department with severe right epigastric pain and vomiting.

History of present illness
The patient had experienced right epigastric pain repeatedly in recent 2 years. He has not been checked up in any other hospital before.

History of past illness
He underwent inguinal herniorrhaphy 10 years ago and without other medical history.

Personal and family history
A significant personal or family medical history did not exist.

Physical examination upon admission
Clinical examination revealed tenderness and rebound pain in the upper abdomen. The Murphy’s sign was positive. A surgical scar of about 4 cm in length can be seen in each of the bilateral inguinal regions.

Laboratory examinations
The results of laboratory examinations are as follows: white cell count, 28.80 × 10^9/L; neutrophil ratio, 91.99%; aspartate transaminase, 123 U/L; alanine aminotransferase, 104 U/L; glutamyl transpeptidase, 116 U/L; albumin, 27.20 g/L; direct bilirubin, 12.70 μmol/L; C-reactive protein, 217.00 mg/L; CA125 (OVL), 65.03 U/mL; CA199 (GIIO), 46.30 U/mL; and amylase, 47 U/L.

Imaging examinations
A computed tomography (CT) scan demonstrated acute cholecystitis and cholecystolithiasis (Figure 1A and 1B). In view of the patient’s poor clinical condition,
percutaneous gallbladder drainage instead of cholecystectomy was performed subsequently. He was discharged 3 d after percutaneous cholecystostomy and readmitted to hospital for cholecystectomy as arranged 1 mo later. However, a repeat CT scan of the abdomen revealed an emerging 3.8 cm × 3.9 cm × 3.0 cm mass between the pancreatic head and the third portion of the duodenum (Figure 1C and 1D). Contrast-enhanced CT suggested that the enhancing mass was probably a hematoma (Figure 1E and 1F). The patient suffered hematochezia and hemorrhagic shock suddenly the next day after CT scan. Emergency percutaneous angiogram was performed and selective catheterization of the superior mesenteric artery demonstrated a pseudoaneurysm in the inferior PDA (Figure 2A).

**FINAL DIAGNOSIS**

Digestive tract hemorrhage, hemorrhage of ruptured PDA pseudoaneurysm, and acute cholecystitis with stones.

**TREATMENT**

We performed coil embolization successfully (Figure 2B and 2C). The patient recovered well after embolization and blood transfusion. Subsequent gastroduodenal endoscopy revealed a 1.0 cm × 1.2 cm depressed lesion with blood clots in the third portion of the duodenum and the surrounding mucosa of the lesion swelled (Figure 3A). Repeated gastroduodenal endoscopy 5 d later showed that the lesion was reduced distinctly and the mucosa was congestive (Figure 3B). After his clinical condition was stable, he underwent laparoscopic cholecystectomy and was discharged from hospital after surgery under satisfactory conditions.

**OUTCOME AND FOLLOW-UP**

Two months after discharge, repeated gastroduodenal endoscopy showed that the lesion disappeared and the mucosa recovered (Figure 3C). He has been doing well without further complication for the last 6 mo.

**DISCUSSION**

Aneurysms of the splanchnic artery are extremely rare with an incidence of about 0.2% of the population[4]. PDA aneurysms account for 2% of all splanchnic artery aneurysms. They are usually asymptomatic. But when PDA aneurysms rupture, the clinical manifestations may range from non-specific abdominal pain to gastrointestinal hemorrhage and hemorrhagic shock. PDA pseudoaneurysms can occur after pancreatitis, abdominal trauma, septic emboli, iatrogenic injuries, penetrating duodenal ulcers, and malignancies, and they often rupture into the gastrointestinal tract[2,3]. However, true aneurysms of the PDA are usually associated with coeliac axis stenosis, and rupture into the retroperitoneal space[5]. Hemorrhage results from PDA pseudoaneurysms is a fatal complication. The mortality has been reported as greater than 25%[6]. Diagnosis of aneurysms can be made if the presence of an abdominal mass or bruit is found. Abdominal ultrasonography, CT, and magnetic resonance imaging are useful in detecting aneurysms. Angiography plays a vital role and is considered the gold standard for diagnosis of aneurysms. The risk of rupture of PDA aneurysms is not dependent on the size. Hence, it is advocated that all PDA aneurysms, regardless of size, should be treated actively once the diagnosis is established[7].

This case we reported here is really rare. The patient did not have a PDA pseudoaneurysm at first while an emerging PDA pseudoaneurysm was found by accident 1 mo later. It is hard to explain the pathogenesis of PDA pseudoaneurysm in this patient in such a short time. Although most of PDA pseudoaneurysms are due to pancreatitis and trauma, this patient did not exhibit acute or chronic pancreatitis and he did not undergo blunt or penetrating abdominal trauma. The pseudoaneurysms of the cystic artery and hepatic artery secondary to cholecystitis or percutaneous intervention of biliary tract have been reported[8]. However, no studies have showed the relationship between calculous cholecystitis or interventional procedures of the biliary tract and PDA pseudoaneurysms.

The major treatments for pseudoaneurysms consist of surgery or angiographic...
Figure 1 Computed tomography images. A: Coronal computed tomography (CT) image showing the gallstones (white arrow) and acute cholecystitis; B: Axial CT image showing the normal morphology of the pancreas and that there was no mass between the pancreatic head and the duodenum; C and D: Coronal (C) and axial (D) CT images revealing an emerging 3.8 cm × 3.9 cm × 3.0 cm mass (white arrow) between the pancreatic head and the third portion of the duodenum; E and F: Coronal (E) and axial (F) contrast-enhanced CT images showing a 4.4 cm × 3.2 cm × 3.0 cm, well defined, ovoid, enhancing mass (white arrow) between the pancreatic head and the duodenum.

embolisation. Surgery used to be the accepted gold standard for treatment of pseudoaneurysms. Angiography plays a crucial role in making accurate diagnosis, with the additional benefit of therapy in some cases[10]. For example, once the source of hemorrhage is identified on angiography, percutaneous transcatheter angiographic embolization is recommended in hemodynamically stable patients. Compared with surgery, endovascular embolization is a less invasive and shorter procedure with a good success rate and associated with a shorter hospital stay[11]. However, the risk of endovascular interventions should be considered. Reported complications include migration of coils, aneurysmal rupture, aneurysmal reperfusion, inadvertent occlusion of other vessels, and infection[7].

Pseudoaneurysms of the PDA that rupture into the duodenum causing massive hemorrhage are rare and life-threatening. In this case, the patient was successfully treated with the accurate diagnosis and effective coil embolization. Clinicians should consider the possibility of ruptured pseudoaneurysms in patients with active gastrointestinal bleeding. The familiarity of this disease and appropriate treatments will save lives timely.
CONCLUSION

In conclusion, we have reported a rare case of a patient who did not have a PDA pseudoaneurysm at first while an emerging PDA pseudoaneurysm was found by accident 1 mo after percutaneous gallbladder drainage. The pseudoaneurysms of the PDA ruptured into the duodenum, causing life-threatening hemorrhage. The patient was successfully treated by effective coil embolization. The report of this case may arise awareness among clinicians regarding pseudoaneurysms as a possible cause of gastrointestinal bleeding.
Figure 3  Gastroduodenal endoscopy. A: Gastroduodenal endoscopy revealed a 1.0 cm × 1.2 cm depressed lesion with blood clots (white arrow) in the third portion of the duodenum and the surrounding mucosa of the lesion swelled; B: Gastroduodenal endoscopy 5 d later showed that the lesion was reduced distinctly (white arrow) and the mucosa was congestive; C: Gastroduodenal endoscopy showed that the lesion disappeared (white arrow) and the mucosa recovered two months after discharge.

ACKNOWLEDGEMENTS
The authors sincerely thank Mr. Yu Zhang for his support and excellent assistance in this work.

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