CASE REPORT

Cystic artery pseudoaneurysm following acute necrotising pancreatitis

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SUMMARY

Cystic artery pseudoaneurysm is a rare pathology. Of the 20 cases reported so far, chronic cholecystitis and iatrogenic biliary injury form the majority of causes. Currently, there is no published report of such pseudoaneurysms caused secondary to pancreatitis, hence the management in such a scenario is unclear. We hereby present the first such report of cystic artery pseudoaneurysm occurring as a sequel of acute necrotising pancreatitis. A 33-year-old man who recovered from a recent attack of acute pancreatitis was readmitted for melena and fever. Computed tomography of abdomen revealed blood in the gall bladder with pericholecystic blush and resolving pancreatic necrosis. Percutaneous transarterial embolisation of the cystic artery was done. This stabilised the patient but persistent sepsis and clinical deterioration warranted a surgical exploration and cholecystostomy. Hence, transarterial embolisation followed by surgery in selected cases can be an ideal management protocol.

BACKGROUND

Cystic artery pseudo aneurysm is a rare condition, with less than 20 cases reported so far. Predominant causes include acute cholecystitis, iatrogenic biliary injury and pericholecystic arteriovenous malformations. Presentation is usually in the form of haemobilia and melena, or rarely as an intraperitoneal haematoma.¹ If left untreated, it can cause lethal sequelae in the form of biliary obstruction, biliary sepsis, acute pancreatitis or even haemodynamic instability in case of massive bleeding. Acute necrotising pancreatitis are notorious for causing visceral artery pseudoaneurysms² but there has been no literature report of acute pancreatitis causing cystic artery pseudoaneurysm.

Cystic artery pseudoaneurysm with underlying acute pancreatitis can make the management of this condition very challenging. While persistent haemobilia can lead serious consequences like cholangitis, biliary sepsis and aggravation of acute pancreatitis, doing early surgery on the other hand, significantly adds to the morbidity due to underlying pancreatitis. Thus, the management requires a comprehensive multi-disciplinary approach of surgeons and radiologists. We hereby, share our experience in management of a case of cystic artery pseudo aneurysm secondary to acute pancreatitis. This case also widens the already lengthy list of

potential complications which can occur following acute pancreatitis.

CASE PRESENTATION

A 33-year-old man, chronic alcoholic, presented to us with 3 days history of severe abdomen pain and vomiting. Serum amylase and lipase levels were elevated. After initial resuscitation, a computed tomography (CT) of the abdomen was taken which showed non-enhancing heterogeneous areas of necrosis (<30%) in the head and body of pancreas with extensive peripancreatic fat stranding, consistent with acute necrotising pancreatitis and a normal gall bladder (figure 1). He responded well to conservative measures, had a smooth recovery, and was discharged within a week of admission.

After 3 weeks, he presented again to the casualty with complaints of melena and fever. On examination, he had pallor but no abdominal signs.

INVESTIGATIONS

Blood investigations revealed low haemoglobin (5.4 g/dL), raised bilirubin levels (3.0 mg/dL), raised liver enzymes (AST/ALT—91/82 IU/mL) and raised alkaline phosphatase (324 IU/mL).

Ultrasound abdomen showed grossly distended gall bladder with hyperechogenic fluid suggestive of blood.

An emergency CT angiogram was done which revealed blood inside the gall bladder (haemocholecyst) and blush around the gall bladder neck in the region of right hepatic artery (figure 1). Minimal residual pancreatic necrosis was also noted.

DIFFERENTIAL DIAGNOSIS

Bleeding peptic ulcers, erosive gastritis, haemorrhagic/ruptured pseudocysts.

TREATMENT

Conventional angiogram through right femoral retrograde approach was performed which showed a small pseudo aneurysm arising from the distal aspect of cystic artery with active contrast extravasation into the gall bladder. The cystic artery was super selectively engaged and embolized with gel foam (figure 2A).

Post procedure, the patient was haemodynamically stable with no clinical or biochemical evidence of on-going blood loss. However, 3 days after the procedure, he started having febrile episodes not responding to broad spectrum antibiotics.

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Figure 1 (A) Computed tomography (CT) showing acute pancreatitis with normal gall bladder during the index admission. (B) CT showing haemocholecyst with resolving acute pancreatitis and minimal pancreatic necrosis.

Suspecting gall bladder gangrene owing to cystic artery embolisation, a sonogram was taken which showed loss of vascularity in the gall bladder and a 12×7 cm heteroechoic collection in the gall bladder fossa. In view of sepsis and clinical deterioration, he underwent an emergency laparotomy which revealed a sloughed out gall bladder cast with dense adhesions to adjacent omentum, transverse colon and duodenum and a huge haematoma plug. After thorough peritoneal washes and haematoma evacuation, a tube drainage of the gall bladder fossa was performed as a damage control procedure. Lesser sac was not entered as the patient had resolving pancreatic necrosis with no radiological signs of retroperitoneal infection.

The patient recovered well after the surgery and was discharged with cholecystostomy tube in situ. The biliary fistula, formed as a sequelae to drainage, was tackled later with an Endoscopic Retrograde Cholangio-Pancreaticography (ERCP) and biliary stenting following which it got obliterated and the drain was removed.

Visceral artery pseudoaneurysms are uncommon but life threatening surgical emergencies. Of the 20 cases of cystic artery pseudoaneurysm which have been reported worldwide, most of them have been secondary to cholecystitis or iatrogenic biliary injury.^{3–6}

Pseudoaneurysms are notorious for their ability to erode through hollow viscera and cause melena with significant blood loss. These can occur as a late complication of acute pancreatitis, affecting major visceral arteries (hepatic artery, splenic artery and gastroduodenal artery). Involvement of cystic artery has not been known to occur so far.

Due to rarity of such presentation and lack of evidence, the management remains subjective and tailored to the patient's condition. It is reasonable and paramount to consider a gastroscopy in a patient presenting with melena/upper gastrointestinal (GI) bleeding. However, the concerns get deviated in the background of recent acute pancreatitis. In such patients, who present with a significantly low haemoglobin and a clinical evidence of on-going blood loss, our protocol is to consider a cross-sectional imaging first followed by a bedside upper GI endoscopy. This helps to pick up a pseudoaneurysm early, which is a far more dreaded complication than peptic ulcers or erosive gastritis, and often present with a similar clinical picture (haematemesis/melena).⁷ A CT angiogram also reveals the development of a local complication, like a pseudocyst or bleeding into a pseudocyst, if any.

The presence of pseudoaneurysm with underlying sterile pancreatic necrosis makes the scenario very challenging. Once

Figure 2 (A) Conventional angiogram revealing the pseudoaneurysm of cystic artery and active extravasation into the gall bladder. (B) Angioembolised cystic artery with arrest of on-going bleeding/contrast extravasation.

diagnosed, a conventional angiogram offers real-time visualisation of the pseudoaneurysm and therapeutic embolisation in the same sitting.^{8,9} We suggest that attempting an embolisation is worthwhile as it helps to maintain haemodynamic stability and potentially postpones the need of an immediate laparotomy which might add to the morbidity in acute pancreatitis. However,

we wish to emphasise that a surgical exploration should not be delayed if the patient develops signs of sepsis and clinical deterioration. Based on the intraoperative findings and general condition of patient, the decision can vary between a cholecystectomy or a drainage alone as a damage control procedure.

Contributors MT conceived of the case. MT and PS initiated the study design. RM and NPK helped with implementation. All the authors contributed to refinement of the case reporting protocol and approved the final manuscript.

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Learning points

- ▶ Acute pancreatitis is notorious to cause pseudoaneurysms of major visceral arteries. This can lead to life-threatening intraluminal or intraperitoneal haemorrhage. Our case suggests that even small calibre vessels can be affected by pancreatitis. Thus, cystic artery pseudoaneurysm adds to the list of potential complications which can occur after acute pancreatitis.
- ▶ Computed tomography angiogram is an excellent investigation to diagnose visceral artery pseudoaneurysms and identify the underlying causative abdominal conditions like acute pancreatitis. It acts as a road map to plan minimally invasive or surgical interventions, whichever is optimal.
- ▶ With the advent of radiological interventions, therapeutic angioembolisation has become an index management option for the management of these pseudoaneurysms.
- ▶ Gangrenous cholecystitis is an anticipated complication following cystic artery angioembolisation. Initial line of management should be a cholecystostomy as a laparotomy adds to the morbidity with underlying sterile pancreatic necrosis. Surgical exploration, however, should not be delayed if the patient develops signs of sepsis.

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