Unusual presentation of more common disease/injury

Pancreatitis-associated pseudoaneurysm of the splenic artery presenting as lower gastrointestinal bleeding: treatment with transcatheter embolisation

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Summary

Pancreatitis is a known cause of pseudoaneurysms of the peripancreatic arteries, which can rarely rupture into various adjacent structures and become a source of life-threatening bleeding. The management is challenging and requires an individualised approach and multidisciplinary care. Herein, we present the case of a 24-year-old man in whom a splenic pseudoaneurysm ruptured into the adjacent infected pseudocyst, communicating with the colon by a fistulous tract, causing massive lower gastrointestinal bleeding. This was successfully managed by transcatheter arterial embolisation (TAE).

BACKGROUND

Bleeding into the colon is an extremely uncommon complication of pancreatitis-associated pseudoaneurysm rupture. Rupture of the pseudoaneurysm into adjacent structures, including pseudocysts, the abdominal cavity, the gastrointestinal tract and the pancreatic duct is a potentially fatal complication. Timing of the rupture is unpredictable; prompt diagnosis and correct management is crucial. A high index of suspicion is required to make an early diagnosis. Optimal treatment in such cases remains controversial; surgical management can be difficult because of haemodynamic instability or pancreatitis-induced adhesions, and transcatheter arterial embolisation (TAE) is an accepted alternative.

CASE PRESENTATION

A 24-year-old man presented with nausea, vomiting and constant epigastric pain radiating to his back. He had a history of hypertension, diabetes and hypertriglyceridaemia. Laboratory blood tests showed elevated levels of serum amylase and lipase, with mild leukocytosis. Diagnosis of acute pancreatitis secondary to hypertriglyceridaemia was made and appropriate management was initiated. The patient showed gradual improvement over 2 weeks. However, several attempts to start enteral feeding failed and he started to spike fever with abdominal distension and diffuse pain. Repeat laboratory studies showed elevating white blood cells. Contrast-enhanced CT scan of the abdomen and pelvis revealed a large hypodense fluid collection, with enhancing capsule and multiple pockets of air representing a pseudocyst with a superimposed infection (figure 1B). The infected pseudocyst was drained percutaneously and the patient showed gradual improvement. However, after removal of the draining tube, recurrent minimal amount of pussy discharge was noted through a skin sinus and a sinogram followed by a plain CT scan of

the abdomen showed opacification of a small residual pseudocyst and the transverse colon in keeping with a pseudocysto-colic fistula. Several days later, the patient started to pass minimal amount of fresh blood per rectum, intermittently. Colonoscopy and upper endoscopy was performed to locate the bleed. The upper endoscopy was normal. However, the colonoscopy revealed the presence of blood within the colon, with no identifiable source of bleeding. Contrast-enhanced CT scan of the abdomen and pelvis was performed and showed colonic wall thickening and enhancement involving the transverse colon and the splenic flexure. Inflammatory or ischaemic colitis was suspected. However, the patient continued to have rectal bleed and to drop the haematocrit over a period of 2 days. CT angiography of the abdomen and pelvis was performed showing a splenic artery pseudoaneurysm, with no evidence of contrast extravasation (figure 1A). The patient was immediately transferred to the angiography suite. Selective coeliac

Figure 1 (A) Contrast-enhanced CT scan of the abdomen and pelvis at the level of the splenic artery shows a focal region of homogeneous enhancement within the pseudocyst (arrow) similar to that of the abdominal aorta representing a splenic artery pseudoaneurysm. (B) Coronal reconstruction shows a large collection with enhancing capsule and multiple pockets of air representing a pseudocyst (asterisk).

Figure 2 (A) Selective splenic angiography before embolisation shows pseudoaneurysm arising from the splenic artery (arrow). (B) Selective splenic angiography after embolisation shows multiple coils (arrowhead) across the neck of the pseudoaneurysm which is completely isolated.

angiography was performed showing the pseudoaneurysm (figure 2A). The splenic artery was selectively catheterised using a five-french angiocatheter after which isolation of the pseudoaneurysm was planned. The distal splenic arterial branch arising directly from the pseudoaneurysm was selected using a 3F microcatheter system and TAE was performed using coils. Postembolisation angiography demonstrated complete exclusion of the pseudoaneurysm and adequate flow distally in the splenic artery (figure 2B). Continuous supportive management with intravenous antibiotics and parenteral feeding resulted in gradual improvement of the patient's condition. The patient was started on enteral feeding and eventually discharged home after 50 days of hospitalisation.

DISCUSSION

Pancreatitis is the most common cause of pseudoaneurysms arising from the peripancreatic arteries.¹ In addition, pseudoaneurysms involving the peripancreatic arteries can be traumatic, iatrogenic or secondary to peptic ulcer disease.¹ The splenic artery, because of its contiguity with the pancreas, is the most common artery involved, followed in decreasing order of frequency by gastroduodenal, pancreaticoduodenal, hepatic and left gastric arteries.²⁻³ Two mechanisms have been described for pancreatitis-associated pseudoaneurysm formation, which may overlap and coexist.⁴ The first is direct damage of vascular structures by the spread of pancreatic enzymes resulting in necrotising arteritis. The second is the presence of a longstanding pseudocyst, which may cause vascular erosion from enzymes within the pseudocyst, direct compression or ischaemia. The risk of rupture of a splenic artery pseudoaneurysm can be as high as 37%, with the death rate ranging between 12% and 57% if treated and approaching 90% when untreated or unrecognised.⁵⁻⁶ In our case, the patient who was diagnosed with necrotising pancreatitis and infected pseudocyst formation, presented with intermittent lower gastrointestinal bleeding and the initial CT scan suggested an inflammatory or ischaemic origin of the bleed, which was minimal and intermittent initially. No vascular abnormality was identified at that time, most likely because the CT images were obtained in the venous phase limiting the sensitivity of the scan. However, continuous bleeding necessitated a CT angiography that showed a small splenic artery pseudoaneurysm. Heightened clinical suspicion in patients with pancreatitis and acute abdominal pain, decreasing haematocrit, haemodynamic instability and/or

gastrointestinal bleeding with no obvious intraluminal cause in combination with appropriate diagnostic modalities is mandatory for early and precise diagnosis. Secondary haemorrhage from pseudoaneurysms, which is usually devastating and needs immediate intervention, may involve the pancreatic duct (haemosuccus pancreaticus), retroperitoneum, peritoneum, adjacent organs (stomach, colon) or a pseudocyst which coexists in 41% of cases.¹⁻⁴

Clinically, rupture of or bleeding from splenic artery pseudoaneurysms typically manifests as abdominal pain, silent anaemia with melena, intermittent or massive haematochezia or haematemesis.¹ Our patient presented with lower gastrointestinal bleeding, which was eventually explained by bleeding from the pseudoaneurysm into the pseudocyst communicating with the colon by a fistulous tract. This presentation has been rarely reported in the literature.¹ Diagnosis can be made with several radiological techniques, which each has its advantages and limitations, including grey scale and colour Doppler sonography, MRI and MR angiography, CT angiography and direct catheter angiography. Detection of active gastrointestinal bleeding and localisation of the source can be accurately achieved by CT angiography which provides a rapid, non-invasive and highly reproducible imaging modality.⁷⁻⁸ The current studies support the inclusion of CT angiography in the diagnostic algorithm of acute gastrointestinal haemorrhage, which enhances the sensitivity and specificity of the imaging modality.⁷⁻⁸ Direct catheter angiography, which allows imaging of small vessels and concomitant treatment, has been assumed to be the gold standard for diagnosis and characterising the exact anatomic site. However, since gastrointestinal haemorrhage can be intermittent, the identification of the source of bleeding or the haemorrhagic lesion serves to determine the suitability of conventional angiography and direct the interventional radiologist during mesenteric catheterisation after localising the bleeding source.⁷ Acquisition of precontrast CT images will help to depict any pre-existing intraluminal hyperattenuating material.⁸ Peripancreatic pseudoaneurysms may show increased attenuation on unenhanced scans, and the perfused portion will enhance strongly after contrast infusion. In the arterial phase, splenic artery pseudoaneurysms appear as focal regions of enhancement in the low-density intracystic fluid.

Splenic artery pseudoaneurysms have been traditionally managed with open surgical resection or ligation, partial pancreatectomy and/or splenectomy.⁹ However, surgery

can be complicated as peripancreatic inflammation and adhesions prevent identification and isolation of the bleeding vessel and cause complete inability to control bleeding.¹⁰ Transcatheter intervention, mainly by embolisation, has been recently considered the treatment of choice, especially in patients with a high surgical risk and when surrounding tissue inflammation are estimated to prevent surgery, while controversy still exists because of a 10–15% failure rate.⁹ In haemodynamically stable patients, embolisation gives good immediate results in 67–100% of cases.^{11–12} The patient in our case was relatively stable although he was continuously dropping the haematocrit; TAE was thought to be more favourable than surgical intervention. Several techniques for the interventional treatment of pseudoaneurysms have been reported in the literature. The first is embolisation proximal to the pseudoaneurysm. Although it is technically easy, it requires a longer time to produce complete thrombosis of the pseudoaneurysm because of reverse blood flow via collateral vessels, leaving the pseudoaneurysm at risk for rupture.¹³ Embolisation of the aneurysm neck can spare the blood flow of the parent artery limiting the risk of splenic infarction; however, fragility of the pseudoaneurysm wall may induce rupture during infusion of the embolising material.¹⁴ Embolisation of the normal portions of the artery both distal and proximal to the pseudoaneurysm with coils, which achieve permanent embolisation without increasing the intravascular pressure, is generally believed to be the best procedure. To avoid splenic infarction, care must be taken to spare the collateral circulation supplying the spleen.

Major complications reported after TAE include acute exacerbation of chronic pancreatitis, splenic infarction, pancreatic abscess, bowel ischaemia and migration of occluding device, all of which are rare.^{1–15} Failure of percutaneous treatment can result from the inability to catheterise the vessel, arterial spasm or rupture of the pseudoaneurysm.¹⁵ Finally, it has been recommended that all splenic artery pseudoaneurysms be repaired, regardless of size or symptoms as the timing of rupture is unpredictable.¹

Competing interests None.

Patient consent Obtained.

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Learning points

- ▶ Pseudoaneurysms of peripancreatic arteries may arise as a complication of pancreatitis.
- ▶ It can result in life-threatening haemorrhage when ruptured into adjacent abdominal structures, the timing of which is unpredictable. The clinical presentation can be variable and urgent diagnosis is essential.
- ▶ CT angiography is a sensitive and a specific non-invasive imaging modality in detection of ongoing gastrointestinal haemorrhage of unknown origin. It provides beneficial information to determine the suitability of catheter-directed angiography and guide mesenteric catheterisation.
- ▶ All splenic artery pseudoaneurysms should be repaired, regardless of size or symptoms.
- ▶ Transcatheter arterial embolisation (TAE) is a favourable choice due to recent advancements of interventional radiology and especially when surrounding pancreatitis-induced adhesions are estimated to prevent surgery.

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