



Splenic pseudo-aneurysm complicating acute pancreatitis: Endovascular trans-catheter embolisation with coils and N-butyl cyanoacrylate



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A B S T R A C T

Splenic aneurysms are rare but life-threatening complications of acute pancreatitis. The main risk is aneurysmal rupture and subsequent death from haemorrhage if not treated promptly.

For a long time, surgery has been the mainstay of definite treatment of splenic aneurysms. In this report, we highlight a partially ruptured splenic aneurysm which was successfully treated via endovascular trans-catheter embolisation using N-butyl cyanoacrylate glue and metallic coils.

Case presentation

A 56-year-old gentleman presented to the emergency department with epigastric pain.

His vital signs were within normal physiological limits: pulse (88 bpm, regular), RR (16/min), temperature (36.8 °C), BP (135/82 mmHg) and oxygen saturation (98% on air).

Initial neurological and cardio-respiratory examinations were normal.

Examination of the abdomen revealed generalised tenderness and mild guarding especially over the epigastrium. Normal bowel sounds were present with no rigidity or hepato-splenomegaly however.

Over a 3-hour period, his condition had significantly deteriorated, becoming hypotensive (BP = 90/54), tachycardic (pulse = 110) and tachypneic (RR = 22).

On analysis of initial laboratory results, WBCs (14.6×10^9), neutrophils (13.4×10^9), amylase (605 U/L) and LDH (1381 U/L) levels were all raised. His PaO₂ (7.8 kPa) on blood gas analysis was normal.

Using the Glasgow scoring criteria for acute pancreatitis, he scored 3 out of 8 due to his age (> 55), LDH (> 600 units/L) and PaO₂ (< 8 kPa). A score > 2 indicates severe acute pancreatitis.

He was therefore transferred to the intensive care unit where he required fluid and oxygen resuscitation to restore haemodynamic balance. His [Hb] at this point was 13 g/dL.

Following this initial resuscitation period, he was transferred to the emergency surgical unit (ESU).

NICE recommends performing a CT scan within 24 h of presentation in suspected acute pancreatitis. A CT scan performed 8 h following admission to the ESU showed severe pancreatitis (Fig. 1).

NICE also recommends performing an USS to rule out gallstone disease as a causative factor of acute pancreatitis.

An USS performed 18 h following admission to the ESU reported a gall bladder containing multiple gallstones (Fig. 2).

A second CT scan was performed 3 days later to assess the degree of pancreatitis following treatment.

As demonstrated in Fig. 3, the level of inflammation had increased especially around the tail of the pancreas. The scan also reported haematoma in the anterior abdomen.

A week into admission, the patient's inflammatory markers were still high (WBCs = 14.8×10^9 , CRP = 53). His [Hb] had also dropped significantly from 13 g/dL to 10.7 g/dL and platelet count from $370 \times 10^9/L$ to $180 \times 10^9/L$.

A multi-disciplinary meeting between doctors in intensive care, radiology, gastroenterology, general and vascular surgery was held. Following this discussion, it was decided a surgical or endovascular approach was required for definite treatment of clinical picture.

Firstly, a digital subtraction angiogram involving the main splenic artery was performed (Fig. 4).

Consent was sought from the patient. Using the Seldinger technique, a 5 French diagnostic catheter was passed via the left common femoral artery through the left coeliac axis into the splenic artery. An initial flush revealed a saccular aneurysm in a distal branch (Fig. 4). This was seen to be the leaking point for the haematoma seen on the previous CT scan. A total of six 5mm platinum coils were laid into the distal aspect of the splenic artery via a 5 French sheath serving as the guidewire. With the view of preventing migration of the coils, the leaking splenic artery aneurysmal branch was further embolised with the injection of N-butyl cyanoacrylate glue (NBCG). The technique of the injection was

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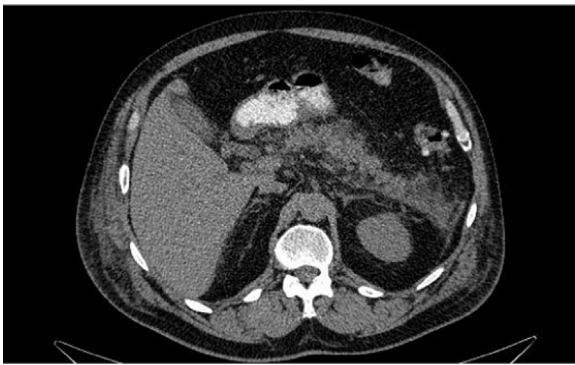


Fig. 1. An abdominal CT scan. Bulky heterogeneous pancreas with severe peri-pancreatic inflammation extending to region of splenic hilum.



Fig. 4. A digital subtraction angiography. Aneurysm well demonstrated in a distal splenic artery branch. Extravasation and hypoperfusion of anterior half of spleen also seen.

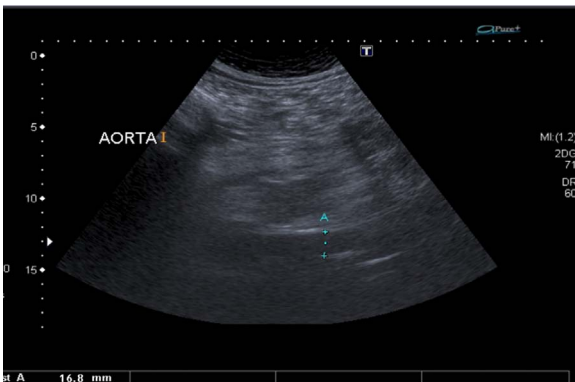


Fig. 2. An abdominal ultrasound scan. Fatty liver and gallstones.



Fig. 3. An abdominal CT scan. Severe peri-pancreatic inflammation. A region of high attenuation extending into the mesentery within the anterior abdomen can also be seen. This is in keeping with an intra-abdominal haematoma possibly from the spleen.

as follows: i. proximal aspect of the ‘coiled’ aneurysm selected with microcatheter ii. NBCG injected continuously until body of aneurysm filled iii. NBCG injection stopped and microcatheter withdrawn.

Case discussion

Splenic aneurysms represent 60% of all visceral aneurysms [1]. In acute pancreatitis, 3–10% go on to rupture if not managed effectively [2].

Many ruptured aneurysms are surgically repaired. This is often associated with complications such as emergency splenectomy, distal pancreatectomy associated with high morbidity and mortality rates [3].

The first reported trans-catheter embolisation of splenic aneurysms was reported four decades ago. Since then, the use of endovascular techniques for a treatment of such rare complication of acute pancreatitis has gathered pace. Modern interventions utilise stent grafting and coils. Indeed, endovascular means of repair of splenic aneurysms carries a higher success and lower morbidity and mortality rates compared to traditional surgical means [4].

The use of glue with metallic coils is a new idea. The success rates for this combination has been reported to be as high as 94–100% [5,6]. The main reason for this is the use of N-butylcyanoacrylate (NBCG), a non-absorbable liquid ester, polymerises rapidly in the presence of ionic substances such as blood from the leaking aneurysm and saline injected into the aneurysm during the procedure [7].

In this report, the patient’s haemoglobin and platelets had dropped significantly throughout his stay in hospital, normal coagulation could not be expected if a laparotomy was performed due to high risk of bleeding. Indeed, definite treatment under normal haemostatic state was achieved with the use of NBCG and coils.

One of the main reasons NBCG is not used a lot in the repair of splenic aneurysms is that the interventional radiologist must be able to determine both the ratio of iodised oil to NBCG and the volume that needs to be used. In this case, a great deal of attention is required to operate [8].

Although surgical approach remains the gold standard, the use of N-butylcyanoacrylate and coils is capable of definitive treatment in splenic aneurysm and coagulopathy complicating a case of acute pancreatitis.

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