

SUCCESSFUL TRANSCATHETER EMBOLIZATION OF SPLENIC ARTERY PSEUDOANEURYSM IN ACUTE NECROTISING PANCREATITIS

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ABSTRACT:

Splenic artery pseudoaneurysm is a rare condition commonly arises as a sequelae of pancreatitis. Pseudoaneurysm is clinically silent until it ruptures. Thus, untreated pseudoaneurysm carries a high mortality rate up to 90%. We present a case of necrotising pancreatitis complicated with unruptured splenic artery pseudoaneurysm, which was found incidentally from computed tomography (CT) of abdomen. Patient was presented with symptomatic anemia and bleeding from the abdominal drain. We proceeded with embolization of pseudoaneurysm by using Histoacryl glue. The embolisation was successful but complicated with partial splenic parenchymal infarction secondary to glue reflux. Despite that, patient was discharged home well. Transcatheter embolization is considered the current treatment of choice for pseudoaneurysm as it provides an alternative to conventional surgery due to its low morbidity and mortality rates. In this case report, we want to share our experience in the approach of the splenic artery pseudoaneurysm management.

Keywords: splenic artery, pseudoaneurysm, pancreatitis, interventional radiology

INTRODUCTION:

Splenic artery pseudoaneurysm is a rare condition that is commonly detected incidentally from radiological imaging. It typically results from the enzymatic autodigestion of the arterial wall by pancreatitis. Untreated pseudoaneurysm is prone to rupture with a high mortality rate of up to 90% (1). Transcatheter embolisation is a treatment of choice due to its high successful rate and lower morbidity and mortality rates than conventional surgery (1,2). In this case report, we want to share our experience in the approach of the splenic artery pseudoaneurysm management.

CASE REPORT:

A 59-year-old man was a chronic alcoholic drinker, admitted with epigastric pain. Glasgow-

Imrie score deteriorated within 48 hours of hospitalisation. Computed tomography (CT) abdomen showed evidence of acute necrotising pancreatitis with peripancreatic collections (Figure 1). Immediate CT guided drainage of the peripancreatic collections done by the interventional radiology (IR) team. Following that, the patient was discharged well. He was readmitted again 3 weeks later for bleeding from the abdominal drain, hypotensive episode with blood pressure of 100/50mmHg and symptomatic anaemia with a haemoglobin level of 6.9 g/dL. Repeated CT revealed unruptured splenic artery pseudoaneurysm (Figure 2A), which was confirmed upon selective splenic angiogram (Figure 2B). The pseudoaneurysm appears arising from the lower pole branch of the

splenic artery. The splenic artery was cannulated with a 1.9Fr microcatheter with its tip placed near the ostium of the lower pole branch due to vascular tortuosity. Embolisation was done with 10% Histoacryl glue mixed with lipiodol. There was reflux of glue into the main and upper pole branch of splenic artery (Figure 3A). Post embolisation angiogram showed non opacification of the upper pole branch, main splenic artery and the pseudoaneurysm with visible collateral arterial supply seen from the left

gastric artery and gastroepiploic artery (Figure 3B). Resolution of splenic artery pseudoaneurysm with 40% viable splenic parenchyma at the upper and lower pole is confirmed by the follow-up CECT abdomen 3 days post embolisation (Figure 3B). Following one-month post-embolisation, patient was in a good condition, asymptomatic with normal haemoglobin level of 10.6g/dL and sonographic evidenced of resolved peripancreatic collections.

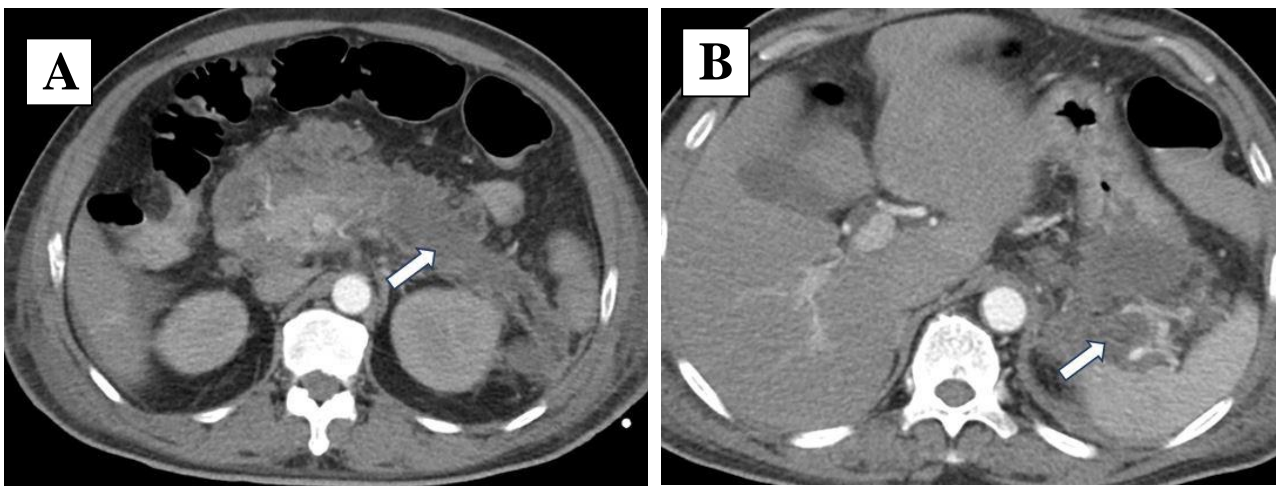


Figure 1: Contrast enhanced CT abdomen shows peripancreatic collections (white arrow in A) extending until splenic hilum (white arrow in B).

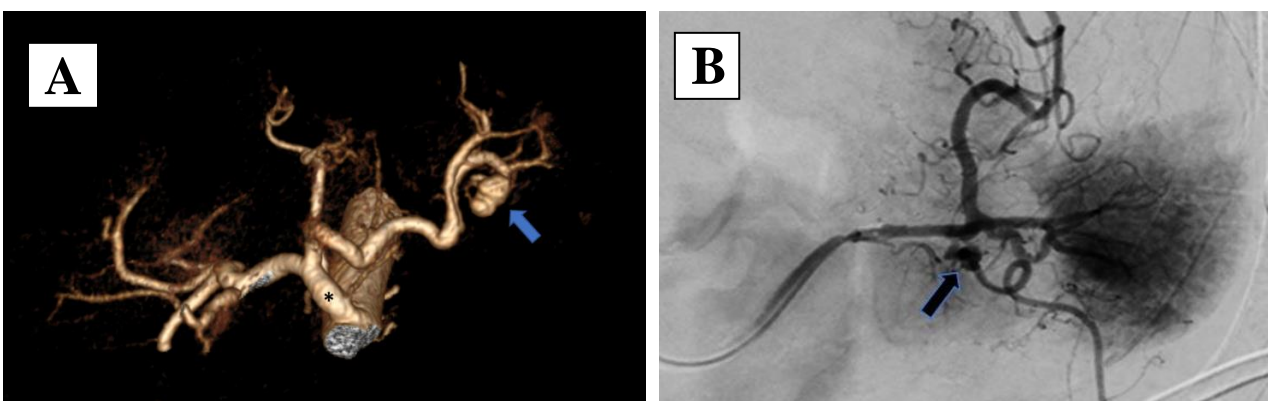


Figure 2: (A) Volume rendering computed tomography angiography (CTA) abdomen shows splenic artery pseudoaneurysm (blue arrow) arising from lower pole branch of splenic artery. Note the coeliac trunk (*) (B) Selective splenic angiogram confirmed the diagnosis of splenic artery pseudoaneurysm (black arrow).

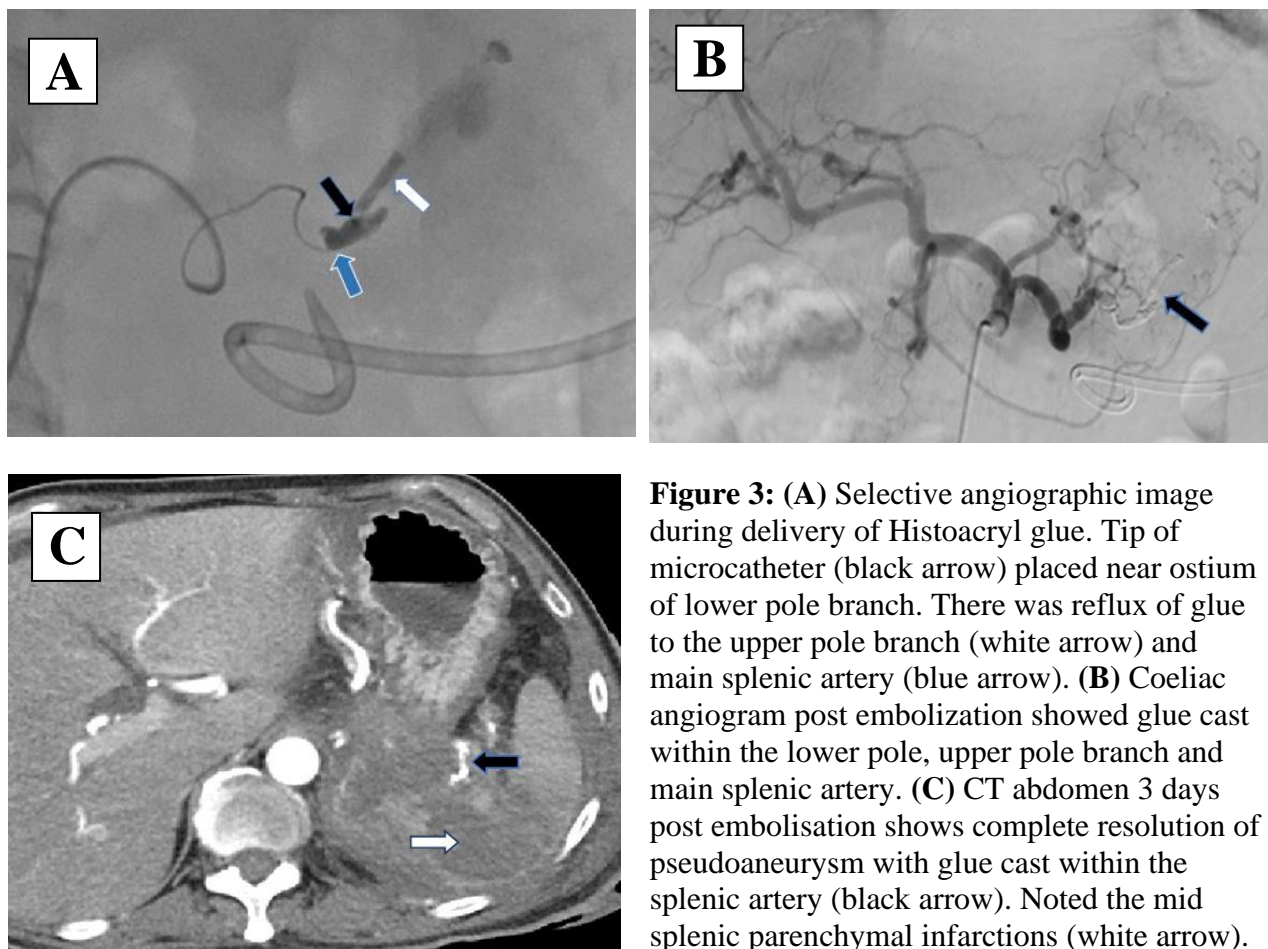


Figure 3: (A) Selective angiographic image during delivery of Histoacryl glue. Tip of microcatheter (black arrow) placed near ostium of lower pole branch. There was reflux of glue to the upper pole branch (white arrow) and main splenic artery (blue arrow). (B) Coeliac angiogram post embolization showed glue cast within the lower pole, upper pole branch and main splenic artery. (C) CT abdomen 3 days post embolisation shows complete resolution of pseudoaneurysm with glue cast within the splenic artery (black arrow). Noted the mid splenic parenchymal infarctions (white arrow).

DISCUSSION

Splenic artery pseudoaneurysm predominantly occurs as a sequela of pancreatitis. The pancreatitis leads to enzymatic autodigestion, which disrupts and weakened the intimal and medial layers of the arterial wall (1,2). Splenic artery is the commonest site for pseudoaneurysm following an event of pancreatitis due to its ordinary course where it runs along the pancreas towards the spleen (3,4). Pancreatic pseudocyst, on the other hand is the other complication of pancreatitis which may induce pseudoaneurysm formation.

Pseudoaneurysm is clinically silent. The patient may present with non-specific symptoms such as hematemesis, hematochezia or melena (2,4). In the current case report, the patient has minimal intermittent bleeding from the abdominal drain, which is one of the earliest signs of impending rupture. The manifestation of

gastrointestinal bleeding is likely due to hemosuccus pancreaticus (1,4). This is a rare condition, occurs due to ruptures of the splenic artery pseudoaneurysm into the pancreatic duct through a fistula and drain into the duodenum via Ampulla of Vater (4). The pseudoaneurysm secondary to pancreatitis appear to be the leading cause of this condition.

Pseudoaneurysm has a thin wall, making the risk of rupture is high. Therefore, early detection and prompt treatment are necessary regardless of its size and irrespective of whether the patient is symptomatic or asymptomatic (2,3). The untreated ruptured splenic pseudoaneurysm carries high mortality rates up to 90%. Transcatheter embolisation is the current treatment of choice for pseudoaneurysm as it is minimally invasive and provides an alternative to conventional surgery. It has high success rates and low post-procedural mortality rates (5,6).

Angiography is also convenient in detecting the accurate location of the pseudoaneurysm, assessing the collateral flow, evaluating the suitability prior to embolisation and appear to be the more accessible approach to the pseudoaneurysm when the conventional surgery would be more complex procedure (5-7).

Few embolisation materials, namely stent, coils, glue (cyanoacrylate), gelfoam and sclerosing agents, are widely available (6,7). The commonly used embolic material is stent. It can be placed in various anatomical sites and can preserve the arterial patency; however, it is not suitable for tortuous vessels such as splenic arteries (6,7,8). Meanwhile, coils and glue are suitable for embolisation of end-artery and tortuous vessel like splenic artery. Similarly, both glue and coils causing occlusion of the inflow, outflow of the pseudoaneurysmal sac by inducing thrombosis (7,9). Glue is especially beneficial for instantaneous vascular occlusion than coils or stent. The cyanoacrylate glue induces thrombosis by polymerization into a cast once it is in contact with the blood plasma (10). Glue also can be delivered more distally if the targeted vessels are small or tortuous (5,9). In this case, the lower pole splenic artery branch is cannulated near the ostium, we unable to selectively advanced the microcatheter into the pseudoaneurysm due to tortuosity. Thus, decision made to embolize the pseudoaneurysm from the ostium by using glue as a primary agent.

Adequate training and expertise are needed in handling the glue as non-targeted embolisation, catheter trapping, and fragmentation may occur as a complication (9). The risk of non-targeted embolisation was high in this case because the position of the microcatheter tip was proximal and near the ostium. Therefore, reflux of glue was anticipated from the beginning. Other than that, the glue concentration used in this case may also play a role in inducing the reflux into main and upper pole branch of splenic artery. Glue and lipiodol mixed concentration were adjusted based on

targeted vessel diameter, catheter tip distance to targeted lesion and blood flow velocity. However, 10% Histoacryl glue-lipiodol mixed concentration used in this case might be lower than the recommended concentration. High glue-lipiodol concentration of around 30% to 50% will be more suitable for rapid polymerization time and occlusion, as well as preventing the mixture from reflux and migration (10).

In this case, the glue was reflux into the main and upper pole branch of splenic artery. Therefore, approximately half of the spleen was infarcted while the remaining received collateral supplies from the left gastric artery and gastro-epiploic artery. Splenic infarction and postembolisation infection are considered least serious complications following endovascular treatment. Other than optimal glue concentrations, reflux and migration of glue can also be prevented by correct injection techniques. Delivery of glue can be controlled by slow but continuous injection to allow the glue cast to fill the vascular lumen. Glue delivery also should be stopped when the blood flow already arrested. Unintended glue adherence and migration can also be prevented by immediate retraction of the catheter after glue injections (10). Meanwhile, splenic infection in this case is prevented by prophylactic antibiotic given prior the procedure. Despite successful embolisation of the pseudoaneurysm, patient was ended up with partial splenic infarction. However, patient has early recovery and was discharged home well. Thus, endovascular treatment is helpful and reliable in reducing the high-risk complication, postoperative morbidity and mortality rate than conventional surgery (8, 9, 10).

CONCLUSION

The accurate diagnosis and prompt treatment of the splenic artery pseudoaneurysm is crucial in providing the best possible patient's outcome. With regards to this, transcatheter embolisation is the ideal approach in preventing invasive surgery.

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