Double Splenic Artery Pseudoaneurysm with Pancreatic Pseudocyst: A Therapeutic Stalemate

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Abstract

Pseudoaneurysm is a rare but a potentially fatal complication associated with chronic pancreatitis. The presence of concomitant aneurysms has been reported rarely and poses a therapeutic challenge owing to the technical difficulty in accessing the distal aneurysm by endovascular means and increased chances of rupture and bleeding. Here, we report an unusual presentation of simultaneous occurrence of two pseudoaneurysms on the splenic artery (SA). A 50-year-old male, a known case of chronic pancreatitis, presented with acute abdominal pain and a pulsating epigastric lump. A diagnosis of double pseudoaneurysm of SA with a concomitant pseudocyst was made based on contrast-enhanced computed tomography and was confirmed by angiography. The endovascular coil embolization by the standard sandwich-technique was expected to increase the risk of expansion and rupture of the distal pseudoaneurysm, and hence was managed by adapting a modified endovascular technique, following which patient made uneventful recovery. Double pseudoaneurysm of SA associated with chronic pancreatitis is an unusual presentation. Conventional endovascular treatment used for single aneurysm may not be feasible in the presence of two aneurysms, and it needs to be tailored according to the physical site, size, and the anatomy of the vasculature associated with the aneurysms.

Keywords: Double pseudoaneurysm, embolization, endovascular, pancreatitis, splenic artery

Introduction

Pancreatic pseudoaneurysm is one of the rare vascular complications associated with pancreatitis and pancreatic surgeries. It occurs as a result of erosion of pancreatic or peripancreatic arteries due to local inflammation and necrosis. Although the incidence of pseudoaneurysm in chronic pancreatitis is only 10%, a mortality rate of 40% has been reported owing to the lethal complications such as rupture and hemorrhage.[1] Most common site for visceral artery pseudoaneurysm is the splenic artery (SA) (60%–65%) followed by gastroduodenal, pancreaticoduodenal, hepatic, and left gastric arteries, respectively.[2] However, the presence of more than one pseudoaneurysm of the same vasculature is very rare. To the best of our knowledge, there are only two cases of double SA pseudoaneurysm in the literature.[3,4] Two diagnostic modalities were used for identifying the pseudoaneurysms in these reports.

With advances in the interventional radiology techniques, endovascular methods have replaced the traditional surgical procedures as the first line of treatment of pseudoaneurysms.[3] However, treatment of concomitant SA pseudoaneurysms poses a therapeutic challenge due to difficulties in accessing the distal aneurysm apart from the increased risk of aneurysm rupture and splenic infarcts.

We report a case of double pseudoaneurysm of SA in a patient of chronic pancreatitis with pseudocyst who was successfully managed by adapting a modified endovascular technique.

Case Report

A 50-year-old male patient, an alcoholic and a known case of chronic pancreatitis, presented with acute abdominal pain of 10-day duration which was radiating to the back. There was no history of hematemesis, melena, fever, or jaundice. Abdominal examination revealed a 6 cm tender mass in the abdomen. Contrast-enhanced computed tomography showed a pulsating mass in the tail of the pancreas. Angiography revealed a neck communication to the aneurysm by a hypervascular link, suggestive of an arteriovenous fistula (AVF) (Figure 1). The endovascular coil embolization by the standard sandwich-technique was expected to increase the risk of expansion and rupture of the distal pseudoaneurysm, and hence was managed by adapting a modified endovascular technique, following which patient made uneventful recovery. Double pseudoaneurysm of SA associated with chronic pancreatitis is an unusual presentation. Conventional endovascular treatment used for single aneurysm may not be feasible in the presence of two aneurysms, and it needs to be tailored according to the physical site, size, and the anatomy of the vasculature associated with the aneurysms.
the epigastrium with transmitted pulsations. His laboratory parameters were all within normal range except for a serum amylase level of 600 IU/ml. Ultrasonography of the abdomen showed multiple calcifications, the possibility of concomitant pseudocyst and two SA pseudoaneurysms. Contrast-enhanced computed tomography (CECT) of the abdomen revealed two SA pseudoaneurysms of 9.7 cm × 6 cm and 5.5 cm × 4 cm located posterior to the tail of pancreas and near upper pole of splenic hilum [Figure 1] which was confirmed by angiography. The patient was managed conservatively for pancreatitis and was taken up for endovascular management of the pseudoaneurysms.

**Intervention**

Through right trans femoral access, the coeliac artery was engaged with a 6F Renal Double Curve Catheter (Medtronic) and SA was selectively engaged through a 4F Yashiro Glide catheter (Terumo). Angiography revealed two large pseudoaneurysms one in the proximal SA and the second one at the hilum. A 2.7 F Progreat Coaxial Microcatheter was advanced over 0.021 inch guidewire into the distal SA beyond the second aneurysm. Two 0.018 inch, 3 cm Hilal Embolization Microcoils (Cook Medical) 3 mm coils were deployed distal and proximal to the pseudoaneurysm at the splenic hilum to exclude the feeder vessel [Figure 2]. For occluding the SA proximal to the proximal pseudoaneurysm, a vascular plug application was attempted, but could not be negotiated due to the right-angled origin of SA. Hence, 0.038 inch MReye embolization coils (Cook Medical) 10 cm coils were deployed distal to, and across the neck and proximal to the pseudoaneurysm, up to the origin of the SA thus excluding it [Figure 3]. Check angiogram showed no dye filling the SA beyond the coils and pseudoaneurysms [Figure 4]. The patient made uneventful recovery and remains asymptomatic during a follow-up of 12 months, and CECT revealed complete aneurysm thrombosis.

The therapeutic challenge expected was that the standard procedure of deploying coils distal and proximal to exclude the proximal aneurysm would increase the risk of expansion and rupture of the distal aneurysm owing to the collateral supply. Moreover, negotiation of the catheter through the thin walled 2 mm distal SA to access distal aneurysm was technically demanding and associated with risk of rupture.

**DISCUSSION**

Pancreatic pseudoaneurysms have a very unpredictable course, and likelihood of developing sudden fatal complications hence should be diagnosed and addressed promptly. Concomitant presence of more than one pseudoaneurysm on the SA is very unusual and poses a therapeutic challenge.[3,4]

Endovascular techniques are considered safe and effective and have replaced the traditional surgical methods of aneurysm repair.[4] Among the endovascular techniques described for the treatment of pseudoaneurysms, metallic coil embolization by sandwich technique is the preferred choice thereby preventing backflow from the collateral circulation.[6] However, the use of this technique is not suitable for multiple pseudoaneurysms as there is an increased risk of expansion and rupture of the distal aneurysm due to the collateral supply.

There are only two reports of double pseudoaneurysm of the SA in the literature. Seicean et al. reported a case of double SA pseudoaneurysm associated with splenic infarct in a patient of chronic pancreatitis.[3] In this report, in view of the associated risks and the coexistent splenic infarct, endovascular procedures were not carried out and SA ligation with splenectomy and pancreatic pseudocyst excision was done. Badour et al. reported yet another case of concomitance of splenic pseudoaneurysm which was managed by endovascular coil embolization.[4] In this report, the distal aneurysm was occluded by deploying multiple microcoils across its neck followed by the conventional sandwich technique for the proximal aneurysm. Unlike the previous cases, vascular plug negotiation was attempted to occlude the proximal SA in our case but was deferred owing to the variations in the anatomy of the vasculature. We used the sandwich technique to exclude the distal one and

![Figure 1](image1.png)

**Figure 1:** (a) Contrast-enhanced computed tomography of abdomen showing concomitant splenic artery (black arrow) pseudoaneurysms (a, c) and pancreatic pseudocyst (b). (b) Contrast-enhanced computed tomography of the abdomen (reconstructed image) showing the proximity of the proximal pseudoaneurysm (a) with the origin of splenic artery (black arrow)

![Figure 2](image2.png)

**Figure 2:** (a) Angiography showing the distal splenic artery pseudoaneurysm (orange arrow). (b) Angiography postembolization showing the 2.018 microcoils (red arrows) across the distal pseudoaneurysm
adapted a modification of the same for tackling the proximal pseudoaneurysm. Our experience with this case demonstrates that it is feasible to manage concomitant SA pseudoaneurysms successfully by adapting the endovascular techniques rather than opting for traditional surgical repair.

In the previous reports, a combination of two different diagnostic modalities was utilized for the identifying the double pseudoaneurysms of the SA. Seicean et al. had used a combination of contrast enhanced transabdominal ultrasound and CECT and Badour et al. utilized CECT and angiography to make the diagnosis.[3,4] In our case, both the aneurysms were diagnosed by CECT, and it was later confirmed by angiography. Although angiography has both diagnostic and therapeutic roles in the management of SA pseudoaneurysms, the diagnostic role of CECT should not be underestimated and helps in planning the endovascular procedure.

**Conclusion**

Double pseudoaneurysm of SA associated with chronic pancreatitis is an unusual presentation. Conventional endovascular treatment used for single aneurysm may not be feasible in the presence of two aneurysms, and it needs to be tailored according to the physical site, size, and the anatomy of the vasculature associated with the aneurysms.

**Declaration of patient consent**

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

**Financial support and sponsorship**

Nil.

**Conflicts of interest**

There are no conflicts of interest.

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