Rupture of Splenic Artery Pseudoaneurysm with Pancreatitis: A Rare Case Report

Taekyung Kang[1] *and Mi-Jin Kang*[2]

[1]Department of Emergency Medicine, Inje University Sanggye Paik Hospital, Seoul, Korea

[2]Department of Radiology, Inje University Sanggye Paik Hospital, Seoul, Korea

Correspondence to: Mi-Jin Kang; email: s2621@paik.ac.kr

Received: 25 Nov 2021; Revised: 18 Jan 2023; Accepted: 20 Jan 2023; Available online: 30 Jan 2023

Summary

Vascular involvement of pancreatic pseudocyst is a rare complication that can potentially result in a fatal outcome. If there is vascular involvement, the splenic artery is most often involved; its rupture and massive bleeding into the peritoneal cavity or retroperitoneal space can lead to hypovolemic shock. We report on a 66-year-old-male patient, who initially presented with atypical chest pain and was diagnosed with a rupture of the splenic artery pseudoaneurysm resulting from chronic pancreatitis. The patient was successfully treated by transcatheter arterial embolization (TAE).The patient's condition improved and he was finally discharged without complications 22 days after admission. The splenic arterial involvement in the patient with pancreatic pseudocyst is an uncommon complication. Chest pain with pleuritic symptom is often misdiagnosed as cardiovascular or pulmonary disease. Proper management depending on hemodynamic stability can prevent a life-threatening event.

Keywords: Pseudoaneurysm, Pseudocyst, Splenic artery, Transcatheter arterial embolization

Ann Afr Surg. 2023; 20(2): 69-73
DOI: http://dx.doi.org/10.4314/aas.v20i2.6

Conflict of interest: None
Funding: None

Introduction

Pancreatic pseudocysts are a common complication of acute, chronic, and traumatic pancreatitis and may occur in 7% of acute pancreatitis and 30–40% of chronic pancreatitis. Alcohol is considered to be the cause of over 80% of all incidences of chronic pancreatitis (1). The head and the body of the pancreas are the most common locations of pancreatic pseudocysts; however, in a few incidences pancreatitis occurs in the extrapancreatic space. Pancreatitis can also be present in organs not adjacent to the pancreas or the extraperitoneal space such as the pleura, mediastinum, and pelvis (2). It can also develop complications such as secondary infection, septicemia, splenic vein thrombosis, and bleeding into the cystic lumen (3, 4). Pseudoaneurysms as a complication of pancreatic pseudocyst is rare but can be life-threatening when they rupture. Although an unruptured pseudoaneurysm is asymptomatic, it presents with abdominal pain and hemodynamic instability when it ruptures. Computed tomography (CT) and angiography are useful for the diagnosis of a pseudoaneurysm. Endovascular intervention is a safe and efficient option for a ruptured pseudoaneurysm.

Here, we report the case of a 66-year-old-male patient who presented with atypical chest pain and was

diagnosed with a rupture of a splenic artery pseudoaneurysm resulting from a pancreatic pseudocyst.

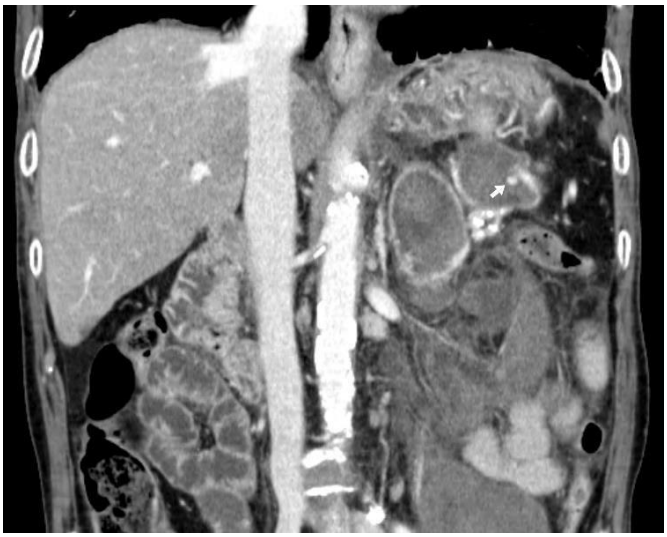
Case presentation

A 66-year-old-male patient was transferred to our emergency department with sudden onset of chest pain that was suspected to be an acute myocardial infarction. The patient had a current history of chronic alcohol consumption and smoking; however, there was no other remarkable medical history involving acute or chronic pancreatitis. The patient had felt new onset mid-sternal chest pain 1 day prior. The characterization of chest pain was continuous and pressing in the substernal and epigastric area. There was no other history of palpitation, dyspnea, nausea, or vomiting.

Initial vital signs showed blood pressure at 124/79 mm Hg, pulse rate of 91 beats/min, respiratory rate of 22 breaths/min, and a body temperature of 36.6°C. Physical examination indicated no particular abnormal finding on his chest. There was mild distension and tenderness in the epigastric region of the abdomen. Electrocardiogram showed normal sinus rhythm without ST segment changes. The initial laboratory study revealed anemia with a hemoglobin level of 8.5 g/dL (normal range 13–17 g/dL), inflammation with C-reactive protein (CRP) of 2.5 mg/dL (normal range <0.3 mg/dL), increased pancreatic enzymes with serum amylase level of 162 U/L (normal range 22–80 U/L), and lipase level of 308 U/L (normal range 0–67 U/L). Other laboratory investigations were normal. Laboratory and physical findings indicated suspected acute pancreatitis due to chronic alcohol consumption.

Abdominal CT showed pancreatic swelling and peripancreatic infiltration with multiple parenchymal calcification, ductal stone, and ductal dilatations in the pancreas, suggestive of acute exacerbation of chronic pancreatitis. In addition, there was a multiloculated cyst (Figure 1) with enhancing wall involving the pancreas tail, spleen, and the left retrocrural area. The cyst seemed tobe arising from the pancreas tail, thus we concluded it tobe a pancreatic pseudocyst. The inferior wall of the pseudocyst was disrupted and the fluid content was leaked out to the left retroperitoneum. The attenuation of the fluid within the pseudocyst was increased, and the pseudocyst was abutting the posterior wall of the splenic artery. Also, there was a small avid enhancing, irregular margined sac-like structure (Figure 2) on the upper portion of the pseudocyst.

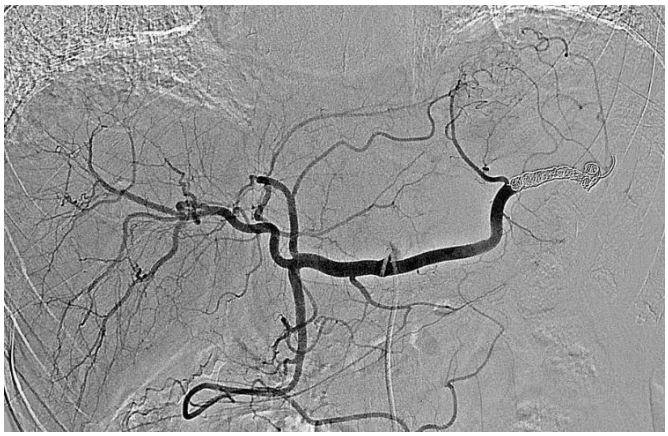
Figure 1. (A). Contrast-enhanced CT demonstrated pseudocyst (arrowheads) with enhancing wall arising from the tail of the pancreas with a small irregular wall enhancing focus (black arrow), probably arising from the splenic artery (white arrows).



(B) Coronal CT also showed a pseudoaneurysm with a small irregular wall enhancing focus (arrow) within the pseudocyst.

Thus the possibility of rupture of the pseudoaneurysm into the pseudocyst was entertained. Therefore, we decided to perform conventional angiography to confirm the diagnosis and treat the pseudoaneurysm or rupture of the pseudoaneurysm.

Figure 2. (A) Celiac angiogram demonstrated a small pseudoaneurysm arising from the inferior portion of the splenic artery (arrow).



(B) After successful embolization, angiogram showed the presence of metallic microcoils in the splenic artery and the complete obliteration of pseudoaneurysm.

The condition of the patient deteriorated after the CT exam. Follow-up vital signs were a blood pressure of 96/60 mmHg, 88 beats/min, respiratory rate at 20/min, and a body temperature of 36.8℃. The patient remained stable after 2 units of packed red cells were transfused. He was later transferred to the intensive care unit (ICU) where his blood pressure dropped to 85/45 mmHg. We then performed an angiography with transcatheter arterial embolization (TAE) to reduce the risk of intraoperative massive bleeding. On celiac angiogram, there was a tiny vascular outpouching lesion with an irregular wall arising from the inferior portion of the splenic artery. Finally, we could confirm a pseudoaneurysm of the splenic artery. The long segment of the distal splenic artery was abutting the pseudocyst based on CT images, thus the possibility of additional erosion was suspected. Thus, all this segment was included in embolization using interlock microcoil. After embolization, complete obliteration was noted in the distal splenic artery and pseudoaneurysm. After the successful embolization, the vital signs of the patient improved and the hemoglobin level recovered to 10.8 g/dL. Thus, the clinicians decided on conservative management of the pseudocyst. However, the patient presented with high fever and severe pain in the left epigastric area 2 days later. Follow-up CT revealed an increased amount of hematoma in the left pararenal space and progressing splenic infarction. We decided to perform ultrasound- guided percutaneous catheter drainage (PCD) to remove a large hematoma and maintain antibiotic therapy to prevent infectious complications. The size of the hematoma decreased and pain was relieved after successful PCD. The patient was finally discharged without complications 22 days after admission.

Discussion

The vascular involvement of a pancreatic pseudocyst is a rare but potentially fatal complication that can occur in nearby blood vessels such as the splenic, gastroduodenal, pancreaticoduodenal, hepatic, and left gastric arteries (5). In the literature, pseudoaneurysms occur in about 10% of patients with a pancreatic pseudocyst and have a 2–10% risk of rupture (6, 7). Pancreatic pseudocysts in acute or chronic pancreatitis contain enzyme-containing fluid rich in amylase and other pancreatic enzymes. The anatomical location can cause enzymatic lysis of the nearby vessel walls and lead to various vessel injuries (8). Bleeding into a contained space or organ can create a pseudoaneurysm. It can lead to contained hematoma when active extravasation stops. A flank rupture of pseudoaneurysm can result in massive bleeding into the intraperitoneal cavity (9).

The most common symptoms of splenic pseudoaneurysm rupture are pain and tenderness in the left-upper quadrant or flank. Upper gastrointestinal bleeding signs like hematemesis, hematochezia, or melena are commonly reported due to fistula formation in the stomach or duodenum. The rupture and massive bleeding into the peritoneal cavity or retroperitoneal space can lead to hypovolemic shock. A relatively rare chest pain with pleuritic symptom, often misdiagnosed as pulmonary embolism, was presented (10).

Contrast-enhanced CT is the best diagnostic tool to detect vascular complications of pancreatic pseudocyst. On CT, splenic pseudoaneurysm shows an arterial phase-enhancing outpouching from the splenic artery or one of its intrasplenic branches. Unlike true aneurysm, this component typically shows a more irregular margin and may be surrounded by hematoma.

Ultrasonography (US) is another method for diagnosis in the emergency room due to its advantages of wide accessibility and no need of contrast media. Contrast-enhanced US is also a good option in patients with impaired renal function (11). Unlike an iodine-based contrast, a sonographic contrast offers the advantage of not inducing nephropathy. However, both diagnostic tools can miss a small pseudoaneurysm and mistake a pseudoaneurysm as pancreatic pseudocyst or other fluid collection. In this situation, angiography is used because it offers vascular supply and collateral blood flow information, as well as prompt intervention such as TAE when the bleeding is detected (12, 13). Therefore, most patients suspected of vascular injuries undergo angiography.

A method of management is decided based on the patient's hemostability. Surgery is the main stream of treatment; however, endovascular intervention, including placement of stents or coil embolization, is a first option for pseudoaneurysm rupture. Many case reports currently show that TAE has been performed successfully in patients with hemodynamic instability (14). TAE is also considered to control active bleeding before surgery and enable a more conservative management. Surgical resection still remains the treatment of choice when the hemodynamic status of a patient is unstable or endovascular therapy has failed (15).

In this paper, we reported the case of a splenic artery pseudoaneurysm by involvement of pancreatic pseudocyst. And the patient was successfully treated by TAE. The rupture of the splenic pseudoaneurysm is a rare complication that requires accurate and prompt diagnosis owing to its potential to be misdiagnosed as chest pain of cardiac or pulmonary origin. Proper management depending on hemodynamic stability can prevent a life-threatening event. Thus, the radiologist and emergency physician should be familiar with the clinical manifestation and CT finding for accurate diagnosis and treatment.

Ethical consideration

Informed consent was acquired from the patient for publication of the case report.

Author contributions

TK led in the conceptualization and writing of the first draft while MK contributed to reviewing and editing the original draft.

References

1. Imrie CW, Buist LJ, Shearer MG. Importance of cause in the outcome of pancreatic pseudocysts. Am J Surg 1988; 156(3 Pt 1): 159-–62.
2. Khaladkar SM, Waghmode AM. Unusual locations of pancreatic pseudocysts in lumbar triangle, psoas muscle and intercostal space, and obturator externus. J Clin Imaging Sci. 2018; Aug 24;8: 33.
3. Misra D, Sood T. Pancreatic Pseudocyst. 2022 Aug 8. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022 Jan–.
4. Anand A, Gunjan D, Agarwal S, et al. Vascular complications of chronic pancreatitis: a tertiary center experience. Pancreatology. 2020 Sep; 20(6): 1085-–1091.
5. Bhasin DK, Rana SS, Sharma V, et al. Non-surgical management of pancreatic pseudocysts associated with arterial pseudoaneurysm. Pancreatology 2013; 13(3): 250-–3.
6. Abdulrahman A, Shabkah A, Hassanain M, et al. Ruptured spontaneous splenic artery aneurysm: a case report and review of the literature. Int J Surg Case Rep 2014; 5(10):754-–7.
7. Parks RW, Tzovaras G, Diamond T, et al. Management of pancreatic pseudocysts. Ann R Coll Surg Engl 2000; 82(6): 383-–7.

8. Goordeen A, Sharbatji M, Khalid S, et al. A case of pancreatic pseudocyst complicated by pseudoaneurysm. Cureus. 2018 Apr 20; 10(4): e2512.
9. Overton-Hennessy ZC, Devane AM, Fiester S, et al. Ruptured splenic artery pseudoaneurysm causing hemorrhage into a pancreatic pseudocyst. Am J Forensic MedPathol. 2022 Mar 1; 43(1): 76-–80.
10. Purushothaman K, Borowski DW. Unusual presentation of spontaneous splenic haematoma due to severe pancreatitis: a cautionary tale. BMJ Case Rep. 2012;; 2012: bcr2012007271.
11. Ierardi AM, Petrillo M, Capasso R, et al. Urgent endovascular ligature of a ruptured splenic artery pseudoaneurysm in a patient with acute pancreatitis: a case report. J Med Case Rep. 2015; 9: 6.
12. De Rosa A, Gomez D, Pollock JG, et al. The radiological management of pseudoaneurysms complicating pancreatitis. JOP. 2012; 13(6): 660-–6.
13. Hyare H, Desigan S, Brookes JA, et al. Endovascular management of major arterial hemorrhage as a complication of inflammatory pancreatic disease. J Vasc Interv Radiol 2007; 18(5): 591-–6.
14. Tessier DJ, Stone WM, Fowl RJ, et al. Clinical features and management of splenic artery pseudoaneurysm: case series and cumulative review of literature. J Vasc Surg. 2003; 38(5): 969-–74.
15. Chiang KC, Chen TH, Hsu JT. Management of chronic pancreatitis complicated with a bleeding pseudoaneurysm. World J Gastroenterol. 2014; 20(43): 16132-–7.