

Management of Hemorrhagic Pancreatitis Secondary to Multiple Vascular Aneurysmal Rupture: A Case Report

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Abstract

Introduction: Peripancreatic vascular complications secondary to acute pancreatitis can lead to hemorrhagic pancreatitis, an unusual complication of pancreatitis with an incidence of 1.3%. Carrying a potential risk of death, this complication necessitates a multidisciplinary approach.

Case: A 46-year-old gentleman presented to our hospital with necrotizing pancreatitis complicated by a pseudocyst a month prior to presentation. During hospitalization, the patient had a sudden decrease in his level of consciousness accompanied by a reduction in hemoglobin levels. Hemorrhagic pancreatitis with bleeding from three major vessels was diagnosed by computed tomography angiography. The bleeding was controlled with angiographic embolization. We present here the radiological findings and interventional techniques used to control life-threatening hemorrhagic pancreatitis.

Conclusion: Hemorrhagic pancreatitis is a life-threatening emergency for which treatment with angiographic embolization should be commenced as soon as possible. Prompt diagnosis, team collaboration, and nonsurgical interventions could be lifesaving.

Key words: Acute pancreatitis, hemorrhagic pancreatitis, interventional radiology, pancreatic pseudocyst.

Introduction

Pancreatitis is a disease with different presentations, ranging from mild abdominal pain to severe complications that can lead to death. It may be localized to the site of the pancreas, extend to adjacent organs, or show systemic involvement (1). According to the Atlanta classification, acute pancreatitis can be assessed by computed tomography (CT) for the amount of local damage secondary to inflammation by assessing for peripancreatic fluid collections, pancreatic and peripancreatic necrosis (sterile or infected), pseudocysts, walled-off necrosis (sterile or infected), and peripancreatic vascular complications (2-4). Nearly 15% of patients with pancreatitis will develop some degree of necrotizing pancreatitis (5). One of the sequelae of peripancreatic vascular complications is hemorrhagic pancreatitis, a rare complication thought to be caused by rupture of a pseudoaneurysm, enzymatic digestion of vessels (in pancreatic necrosis), or bleeding into a pseudocyst (4). A study of 1,356 patients admitted with acute pancreatitis demonstrated that only 1% (14 cases) were complicated with hemorrhage. The mortality rate in this group was high, reaching 36% if hemorrhage occurred (5 of the 14 patients), 80% (4 of 5 patients) if the bleeding was within a week of presentation (6). Hemorrhagic pancreatitis is a challenging complication, has the potential risk for death, and necessitates multidisciplinary teamwork by interventional radiologists, gastroenterologists, and surgeons (7). In this case report, we present a case of hemorrhagic pancreatitis with a rare finding of bleeding from three vessels from three different origins.

Case

Our patient was a 46-year-old gentleman with no past medical history, who presented to our institution after prolonged admission for severe idiopathic pancreatitis in a different hospital. On presentation, he reported abdominal pain associated with vomiting and weight loss. He had earlier been given a diagnosis of acute necrotizing pancreatitis and was managed conservatively. Given that his symptoms did not resolve, medical advice was sought from our center and the patient was transferred. Upon transfer, the patient was vitally stable with epigastric tenderness. His hemoglobin level was 12.5 g/dL, amylase 710 U/L, and lipase 6595 U/L. Within 24 hours, he developed severe abdominal pain and a decreased level of consciousness. He became hemodynamically unstable, looked pale and drowsy, and had a distended and rigid abdomen. His workup revealed a decrease in hemoglobin levels from 12.5 to 9.7 g/dL. Immediate resuscitation with blood products was initiated and urgent chest and abdominal angiographic imaging performed. Imaging showed blood oozing from a small vessel in the region of the pancreatic neck, the development of a pancreatic pseudocyst, and an 11cm wide hematoma in the upper abdomen and anterior to the tail of the pancreas, compressing the stomach. The arterial phase showed a contrast blush in the region of the celiac trifurcation, probably from small capillaries of the left gastric and splenic arteries, with a loss of attenuation

of the distal splenic artery. No splenic artery aneurysm was present, and no pulmonary embolism was detected. (Figure 1) Urgent angio-embolization was arranged, and the patient was sent to the interventional radiology suite. Examination of the celiac and superior mesenteric arteries by conventional angiography revealed a contrast blush along the distribution of the left gastric, splenic, and inferior pancreatic arteries (Figure 2,3,4). A 2.8 Fr Progreat microcatheter (Terumo) was used to select the arteries and coiling was performed with 2 × 5 mm Tornado microcoils (Cook) for the left gastric and splenic artery, followed by embolization using Gel Foam for the inferior pancreatic arteries. Post coil insertion and embolization, angiographic results revealed no blush at the distribution of the feeding vessels (Figure 5). After the procedure, the patient was transferred to the intensive care unit for observation and close monitoring. The following day, abdominal CT angiography was arranged because of a decrease in hemoglobin levels from 9.5 to 6.8 g/dL. Radiological imaging showed a wedge-shaped splenic infarction and no signs of active bleeding. Patient was observed the following days, and recovered from the bleeding with a steady rise in his hemoglobin level. He was transferred to the floor once fully conscious and vitally stable. His general condition improved, started mobilization, tolerated food, and was able to pass normal bowel motions. Given no obvious cause of the pancreatitis, the gastrointestinal team recommended an IgG4 test to exclude autoimmune pancreatitis, but the results were negative. The case was discussed by the gastrointestinal multidisciplinary board, which recommended managing the pseudocyst conservatively. The patient was discharged home to be followed as an outpatient. During his first follow up in a few weeks, the patient was completely asymptomatic with resolution of all abdominal symptoms.

Figure 1: Pancreatic pseudocyst with a large hematoma

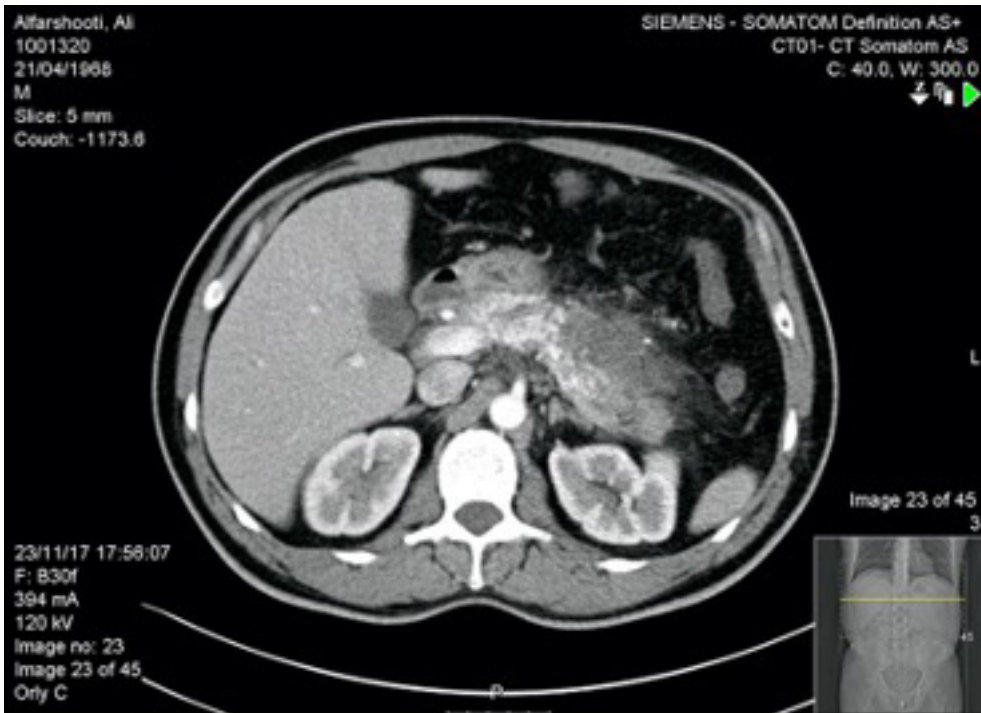


Figure 2: Contrast blush outside left gastric artery

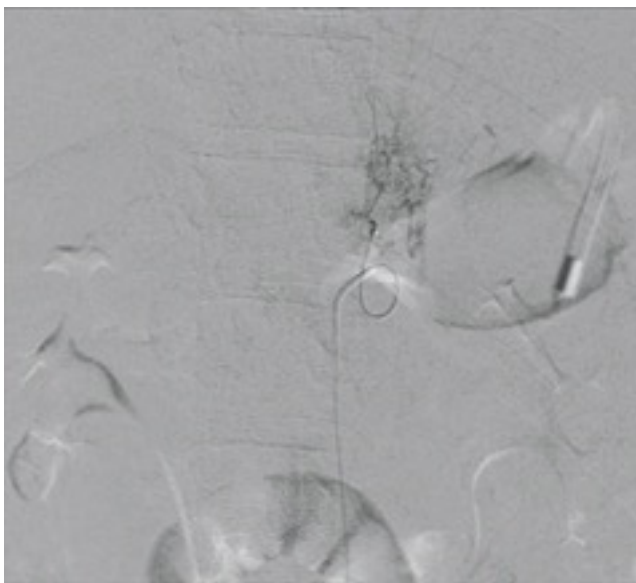


Figure 3: Contrast blush outside splenic artery

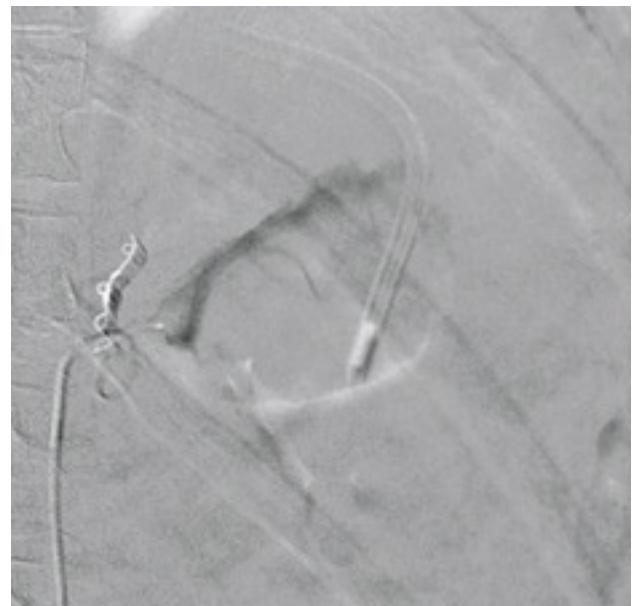
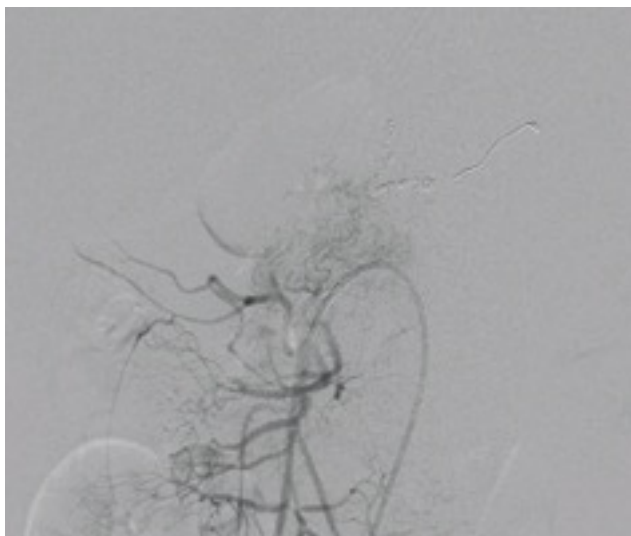
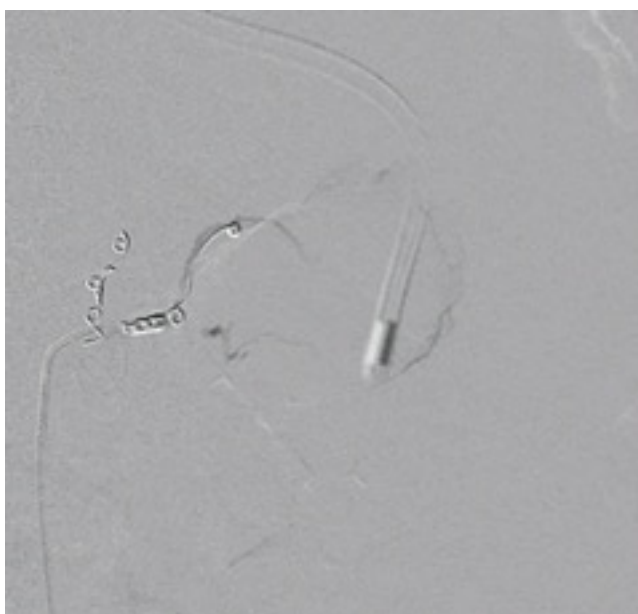


Figure 4: Contrast blush outside inferior pancreatic artery**Figure 5: Successful embolization**

Discussion

Hemorrhagic pancreatitis is an uncommon disease. However, understanding of this presentation is vital because of its fatal sequelae in addition to the high mortality rate (4). Although, the pathophysiology behind this hemorrhagic presentation was explained by different theories (3,4), none are established.

The typical presentation of hemorrhagic pancreatitis includes a sudden drop in hemoglobin levels, findings of bleeding without obvious cause, or a sudden increase in peripancreatic fluid shown on radiological images (8, 9). Moreover, if the patient did not present in the acute setting, the diagnosis would be difficult. This fact remains true despite this era of imaging modalities (10). Doppler ultrasonography is practical as an initial modality; it might show the pulsatile pseudoaneurysm or turbulence of flow inside it (11). It's available bedside and cost-effective. Its drawbacks are that it is operator dependent

and has an artifact in obese and in patients with ileus. In regards to computed tomography (CT), administering contrast material with this modality acts as a good tool in determining the presence of necrosis. On the other hand, CT without contrast is highly specific with specificity reaching 90% (12, 13). CT angiography is highly sensitive in more than 90% of cases and is recommended as the initial diagnostic image in such cases (14). Angiography is superior in detecting and localizing the site of vascular lesions and used as a therapeutic tool (15,16).

The pathophysiology of the hemorrhagic presentation of pancreatitis can be ensued due to a pseudoaneurysm, enzymatic digestion of vessels, or bleeding into a pseudocyst (4). The latter was the mechanism of hemorrhage in this case report. Splenic artery is the most common involved vessel in hemorrhagic pancreatitis with mortality of 33.3% (18, 19), followed by the pancreaticoduodenal and gastroduodenal arteries and (19, 20) less common involved arteries are the short gastric, left gastric, left

inferior phrenic, right gastroepiploic, superior mesenteric, jejunal branches, (arising from superior mesenteric artery), replaced right hepatic (20, 21), middle colic (16, 20) celiac, renal, intercostal, and hepatic arteries (21, 22, 23). In our review of the literature cases with hemorrhage, almost always had bleeding from one distinct artery, in contrast to our patient who had significant hemorrhage from the splenic, left gastric, and the inferior pancreatic arteries simultaneously. Acute hemorrhage from 3 different arteries in such a case is difficult to explain. However, it might be hypothesized by an increase in the digestive enzymes in the pseudocyst.

The standard of care for managing hemorrhagic pancreatitis is to control bleeding by endovascular intervention. It lowers the mortality rate of 80% in untreated patients down to 6% in patients who undergo successful embolization (6, 24). Endovascular interventional techniques include sealing of any arterial pseudoaneurysms by either using embolizing agents or stent. The modality of choice is based on patient stability, location and diameter of the vessel ability to catheterize it, operator's preference, and the ability to cross the pathologic segment to seal the distal portion (23, 24). Different embolizing agents are used, including permanent sealing agents such as platinum coil (which was used in our case report) and Embucrilate (tissue adhesive that is applied as monomer to moist tissue and polymerizes to form a bond) and nonpermanent agents such as gelatin sponge particles, balloon occlusion, and tissue adhesives used for temporary bleeding control as bridging to definitive surgical treatment for those critically ill patients on whom we avoid aggressive lengthy interventions (24, 25). Embolizing by platinum coil and embucrilate is safe, efficient, and has a high success rate in previously reported series with follow-up period of median 17.9 months (0.7-69.5 months) (16, 21, 26). Some authors reported mixing Embucrilate with an oily radiopaque material before injection for technical ease as it shortens its polymerization duration and renders it radiopaque (22, 27). The technical limitation of this practice, is the need to inject the optimal concentration of the mixture and the microcatheter may need to be quickly withdrawn, cleaned and reused (22). Moreover, this method of mixing has an increased risk of reflux into nearby branches causing complications (28). Stenting has limited use in hemorrhagic pancreatitis (20,29), however there is not sufficient data to determine whether such technique is safe.

We used in our case a platinum coil (2x5mm Tornado microcoils) and it was technically successful with no extravasation of contrast from the 3 bleeding vessels. A follow up CT angiography was done after 3 weeks and showed no evidence of re-bleeding. The risk of coiling failure increases with size of the pseudoaneurysm (30) and chronicity of the pancreatitis (15). Iatrogenic acute renal or liver failure may occur after attempts to coil branches of the renal or hepatic artery, respectively (22, 23). Surgical intervention should be reserved for people in good condition who have complications associated with chronic pancreatitis who are not amenable to interventional radiology (31). Some authors believe that the definitive

treatment of a pseudoaneurysm should depend on its location in the pancreas, where pseudoaneurysms in the body or tail would benefit from surgical intervention and pseudoaneurysm in the head would require angiographic embolization (17). Surgical management to hemorrhagic pancreatitis can be done by ligating involved vessels, or even partial pancreatectomy in cases with severe chronic pancreatic inflammation (15).

Conclusion

Hemorrhagic pancreatitis should be highly suspected when there is a sudden decrease in hemoglobin levels, findings of bleeding without obvious cause, or an identification of sudden increase in peripancreatic fluid on radiological images. CT angiography is the best modality for diagnosing hemorrhagic pancreatitis in the acute settings. Our review of the literature strongly suggested that angiographic embolization should be first attempted before any surgical intervention. If the patient continues to demonstrate bleeding into a pseudocyst, and has failed control with embolization and Endovascular management, surgical intervention would be necessary to stop the bleed.

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