Pseudoaneurysm of the inferior pancreatic-duodenal artery: Diagnosis with multislice CT and management by coil embolization

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Section: Interventional radiology
Imaging Technique: CT
Case Type: Clinical Cases

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Patient: 51 years, female

Clinical History:

The 51-year-old female patient was admitted to our hospital because of severe epigastric abdominal pain, low-grade fever (37.8 °C) and anemia.

Imaging Findings:

The patient was admitted to the hospital because of severe epigastric abdominal pain, low-grade fever (37.8 °C) and anemia; with an RBC count of 3.6 x 10^6/microL and a Hgb count of 10 g/dL. There was no significant elevation in the levels of hepatic and pancreatic enzymes. A multidetector-CT scan showed the presence of a large hematoma within the mesentery, anterior to the duodenum, partially involving the uncinate process of the pancreas and extending in to the right anterior pararenal recess. Within the hematoma there was evidence of a small focal vascular dilation (approximately 6 mm in size). A presumptive diagnosis of a pseudoaneurysm (PSA) in the territory of the inferior pancreatic duodenal artery was made. The following day, the patient had a second episode of epigastric pain associated with hypotension and was therefore sent to the angio-suite for a definitive vascular diagnosis and possible therapy. Angiography was performed using a femoral approach and a 4 Fr. Simmons 1 catheter. Superior mesenteric arteriography revealed the presence of a small PSA arising from the inferior pancreatic duodenal artery, with irregular walls consistent with recent bleeding. Superselective catheterization of the bleeding vessel was achieved with a coaxial 3 Fr microcatheter, which was advanced beyond the distal end of the pseudoaneurysm. Several 0.018” platinum microcoils were delivered within the pseudoaneurysmatic vessel, followed by an injection of Gelfoam slurry using a 1cc syringe, until the PSA was completely occluded. The patient's clinical condition improved immediately after the embolization. A multidetector CT scan performed 1 month later confirmed the good results of the embolization and the reduction in size of the retroperitoneal hematoma.

Discussion:

A pancreatic pseudoaneurysm is a malformation of the vessels of the pancreas and/or peripancreatic bed. These rather uncommon pseudoaneurysms are frequently accompanied by life-threatening complications, mainly rupture and bleeding. A better outcome is possible, and requires an accurate, timely, and appropriate diagnosis and medical and/or surgical intervention. The etiological requisites of the dysplastic and aneurysmal changes characteristic of pancreatic pseudoaneurysm formation include the following: acinar cell necrosis and/or ductal disruption with
peripancreatic accumulations of exudative fluid containing activated proteolytic enzymes, which autodigest and weaken the arterial wall and lead to pseudoaneurysm formation; pseudocystic pressure erosion into the adjacent artery; nonsurgical trauma; infections; atherosclerosis; cystic medial necrosis; collagen vascular disease; a history of intravenous drug abuse; arteritis; and dissection. Moderate to severe pancreatitis with or without pseudocyst/abscess formation is the major etiological factor for pseudoaneurysm formation. The splenic artery is the most commonly affected artery (30%–50%) because of its proximity to the pancreas, followed by the gastroduodenal artery (10%–15%), and the inferior and superior pancreaticoduodenal arteries (10%). Pancreatic pseudoaneurysms may be asymptomatic until a rupture occurs. When it happens, other pathological conditions, such as pancreatitis, have to be considered. In fact, both conditions may present with fever, anemia and moderate to severe abdominal pain that is usually progressive. Moreover, patients with pancreatitis may have normal values of pancreatic enzymes levels. The mortality rate of a bleeding pseudoaneurysm is between 12.5% and 37%. When not treated, the mortality rate becomes significantly higher (90%), because the incidence of a spontaneous rupture reaches 50%. Thus, early diagnosis and treatment are essential. To set the diagnosis of a pancreatic pseudoaneurysm, angiography remains the gold standard. The treatment of choice for acute bleeding secondary to pancreatic pseudoaneurysm is surgery, but the risk of complications is high and ranges from 30% to 50%, particularly in elderly and debilitated patients. Recently, the development of catheters has facilitated superselective catheterization, so the embolization of peripancreatic arteries is now considered to be a safe and effective procedure with success rates ranging from 70% to 100%: the embolization may be a life-saving procedure replacing emergency surgery. Several interventional techniques (transcatheter embolization with injection of coils, Gelfoam sterile sponges, Ivalon, or glue into the aneurysm) have been used succesfully for the treatment of a visceral aneurysm. Selective catheterization and embolization with platinum coils are procedure which supply definitive therapy in most cases: the success rate is about 81%. If the aneurysm is not accessible, depending on the anatomy or size of the feeding arteries, coil embolization fails. This necessitates the use of alternative embolic materials that may increase the success rate of the endovascular treatment. In conclusion, percutaneous transcatheter embolization, with its low mortality and high success rates, should be the initial treatment of choice for a pancreatic pseudoaneurysm. Platinum coils and Spongostan delivered or injected by superselective catheterization are safe and suitable materials to achieve a permanent embolization of a bleeding pseudoaneurysm.

**Differential Diagnosis List:** Inferior pancreatic duodenal artery pseudoaneurysm.

**Final Diagnosis:** Inferior pancreatic duodenal artery pseudoaneurysm.

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Case report: Transcatheter embolization of a superior mesenteric artery pseudoaneurysm with interlocking detachable coils.
Description: A multislice CT scan demonstrating a large hematoma within the mesentery, anterior to the duodenum, partially involving the uncinate process of the pancreas and extending in the right anterior pararenal recess. Within the hematoma, a small aneurysm (approx 6 mm in size) is seen.

Origin:
Description: A multislice CT scan demonstrating a large hematoma within the mesentery, anterior to the duodenum, partially involving the uncinate process of the pancreas and extending in the right anterior pararenal recess. Within the hematoma a small aneurysm (approx 6 mm in size) is seen.

Origin:
Figure 2

Description: Volume rendering 3D reconstruction CT images of the aneurysm. The arrow points at the pseudoaneurysm. Origin:
Description: An image obtained with DSA of the superior mesenteric artery revealing the presence of a small pseudoaneurysm arising from the inferior pancreatic duodenal artery. Origin:
Description: An image obtained of the superior mesenteric arteriography revealing the presence of a small pseudoaneurysm arising from the inferior pancreatic duodenal artery. Origin:
Description: An image depicting the superselective catheterization of the bleeding vessel (inferior pancreatic duodenal artery). Origin:
Description: Angiography during and after the release of platinum microcoils and the injection of Gelfoam within the pseudoaneurysmatic vessel. Origin:
**Description:** Angiography during and after the release of platinum microcoils and injection of Gelfoam within the pseudoaneurysmatic vessel. **Origin:**
Description: Angiography during and after the release of platinum microcoils and injection of Gelfoam within the pseudoaneurysmatic vessel. Origin:
Figure 4

a

Description: A contrast-enhanced CT scan obtained two weeks after the embolization of the pseudoaneurysm, in which the hematoma appears smaller in size. Origin:

b

Description: A contrast-enhanced CT scan obtained two weeks after the embolization of the pseudoaneurysm, in which the hematoma appears smaller in size. Origin: