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CASE REPORT

Hemosuccus pancreaticus from superior mesenteric artery pseudoaneurysm within perceived pancreatic mass

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Abstract

Bleeding from the pancreatic duct is a rare source of gastrointestinal hemorrhage and is referred to as hemosuccus pancreaticus. Often a result of pseudoaneurysm formation from chronic pancreatitis, hemosuccus pancreaticus is a difficult diagnosis due to its peculiar clinical presentation. This is a case of a 51-year-old male with a history of chronic pancreatitis, who initially presented with a pancreatic mass found on CT scan. The mass was found to be inconclusive for malignancy on endoscopic ultrasound-guided fine needle aspiration. The patient subsequently was lost to follow-up and returned with melena and evidence of a superior mesenteric pseudoaneurysm in the previous mass on CT angiography. The pseudoaneurysm was successfully treated with endovascular embolization. Diagnosis of hemosuccus pancreaticus can be challenging due to the intermittent nature of hemorrhage and the variable clinical presentation—which initially appeared as a pancreatic neoplasm in our patient. Repeat imaging and angiography are invaluable for both the diagnosis and treatment of gastrointestinal bleeding from an unknown source in the setting of chronic pancreatitis.

Keywords Hemosuccus pancreaticus · Superior mesenteric artery · Pseudoaneurysm · Embolization · Chronic pancreatitis

Introduction

Hemosuccus pancreaticus is a rare cause of gastrointestinal bleeding from the pancreatic duct that is increasingly being identified with the use of computerized tomography (CT) angiogram [1–6]. It is seen in the setting of chronic pancreatitis, pancreatic pseudocysts, or pancreatic neoplasms where the tumor or pancreatitis causes erosion and forms a communication between the pancreatic duct and a vascular structure. Detection of this dangerous bleeding is often delayed. Treatment consists of embolization or surgical ligation in refractory cases.

Pancreatic cancer is one of the fourth or fifth most common causes of cancer mortality in developed countries [7]. With such a poor prognosis, accurate diagnosis of pancreatic lesions is both important and challenging. The majority of pancreatic neoplasms are ductal adenocarcinomas, which are seen as a hypoattenuating solid mass within enhancing pancreatic parenchyma, often with ductal dilation [8]. Other pseudotumoral forms of inflammation including chronic pancreatitis and autoimmune pancreatitis may mimic a neoplasm and account for 5–10% of surgical procedures for suspected cancer [9]. Thrombosed pseudoaneurysms can also be mistaken for pancreatic neoplasm [10, 11]. These alternative diagnoses must be considered when pancreatic neoplasm is suspected.

A search of the literature revealed only two case reports of hemosuccus pancreaticus occurring secondary to pseudoaneurysm of the superior mesenteric artery (SMA)—both of which were in the setting of chronic pancreatitis [12, 13]. This is the first discussion of a patient with hemosuccus pancreaticus secondary to chronic pancreatitis and an SMA pseudoaneurysm, which was initially suspected to be a pancreatic neoplasm. We highlight the challenges of diagnosis and importance of identifying a visceral pseudoaneurysm and subsequent gastrointestinal bleeding in patients with chronic pancreatitis.

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Case report

This is a case of a 51-year-old male with a past medical history of chronic pancreatitis, likely due to ethanol abuse, gastroesophageal reflux disease, gastritis, and diabetes, who presented with epigastric pain, nausea, and two episodes of emesis. He underwent a CT scan with IV contrast and was found to have a 4.7 cm by 3.8 cm by 4.2 cm enhancing mass in the pancreatic head (see Fig. 1) with associated distal pancreatic duct dilation. The patient underwent an endoscopic ultrasound with fine needle aspiration and biopsy of the mass, the result of which was inconclusive for pancreatic neoplasm, but suggestive of an irregular, round, hypoechoic mass with SMA invasion. Cytology showed ductal epithelial cells and inflammation. Tumor markers of CEA and CA19-9 were normal at 2.7 U/mL and 9.8 U/mL, respectively. Liver function tests were normal except for elevated alkaline phosphatase at 111 U/L and lipase at 293 U/L. The patient was then referred to interventional radiology (IR) for CT-guided biopsy of the mass for definitive diagnosis. The patient underwent an initial CT scan in IR that showed a decrease in size of the mass (3.3 cm by 2.9 cm), which also appeared more cystic. Based on these findings, the procedure was aborted.

The patient was lost to follow-up and 1 year later was admitted to the hospital with 5 days of melena with malaise and fatigue and a hemoglobin of 6.1 g/dL. The patient denied hematemesis or weight loss. He underwent esophagogastroduodenoscopy (EGD) and colonoscopy which identified duodenitis, but no discernible source of bleeding. A magnetic resonance image (MRI) was performed (see Fig. 2)

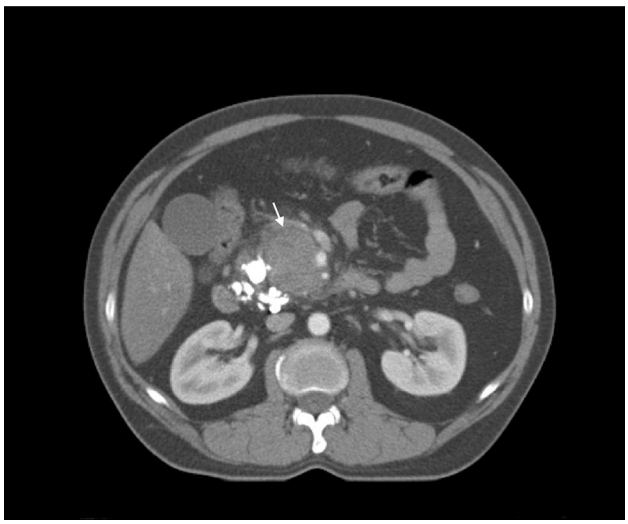

Fig. 1 Diagnostic evidence of pancreatic mass: contrast-enhanced computerized tomography image of 4.7 cm by 3.8 cm by 4.2 cm enhancing mass in the pancreatic head (solid straight arrow)

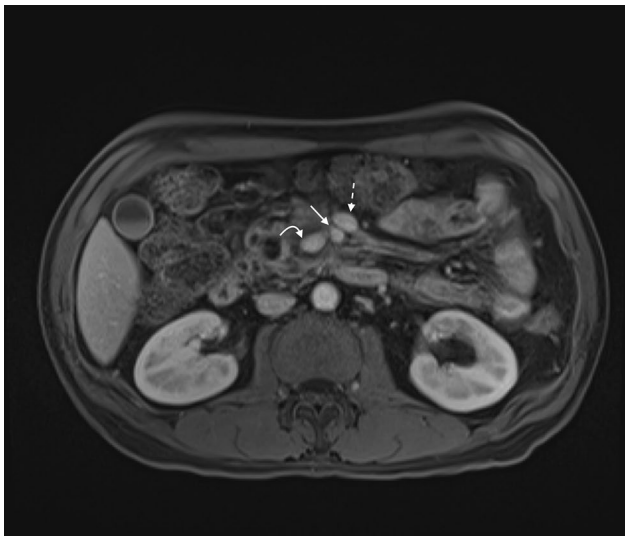

Fig. 2 Diagnostic evidence of pseudoaneurysm: axial magnetic resonance T1 image, demonstrating a 1.2 cm by 1 cm enhancing pseudoaneurysm (curved arrow) adjacent to the superior mesenteric artery (solid straight arrow) and superior mesenteric vein (dashed straight arrow)

and he was later discharged with plans for outpatient follow-up with capsule endoscopy. The MRI showed a 1.2 cm by 1 cm enhancing structure centrally in the previously queried mass, which followed the signal intensity of the blood pool and appeared to communicate with the SMA. The pancreatic duct appeared with areas of narrowing and dilation. The patient was called with the results, but refused to return to hospital as he was no longer having melena. The following day, the patient woke up to dark, tarry stool and was readmitted for evaluation of suspected pancreatic pseudoaneurysm. Using right common femoral access, a selective catheterization and angiogram of the SMA was performed, which showed a pseudoaneurysm arising from the main trunk of SMA (see Fig. 3). The pseudoaneurysm was then selectively cannulated using a microcatheter and was then embolized using multiple detachable coils and Gelfoam (see Fig. 4). Complete thrombosis was achieved and the procedure had no complications. The patient spent one night in the hospital for observation and was discharged the following morning in stable condition. On 1-year follow-up, the patient reported no recurrent evidence of bleeding. There was no clinical indication for follow-up imaging as the patient was doing well.

Discussion

Chronic pancreatitis is well known to cause pseudoaneurysms of visceral arteries, which is seen in 3.5–10% of cases [4]. Although the splenic artery is most commonly affected,

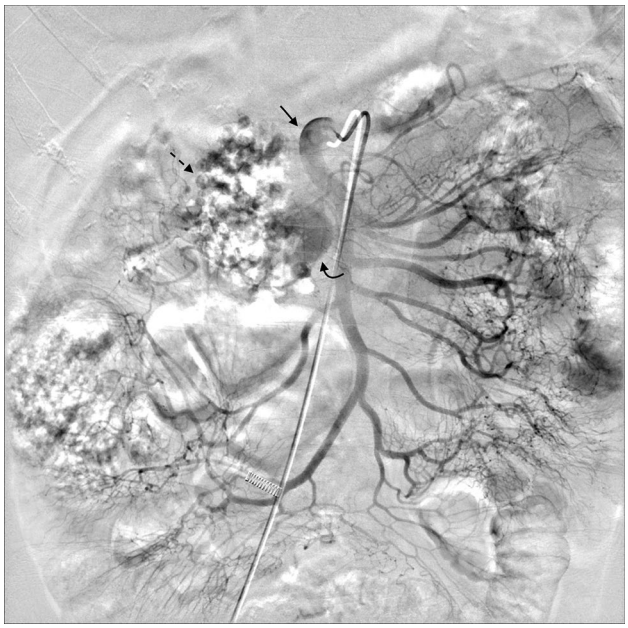

Fig. 3 Pre-embolization angiogram: angiogram of superior mesenteric artery (solid straight arrow) demonstrating filling of aneurysm sac (curved arrow) in the setting of pancreatic calcifications (dashed straight arrow)

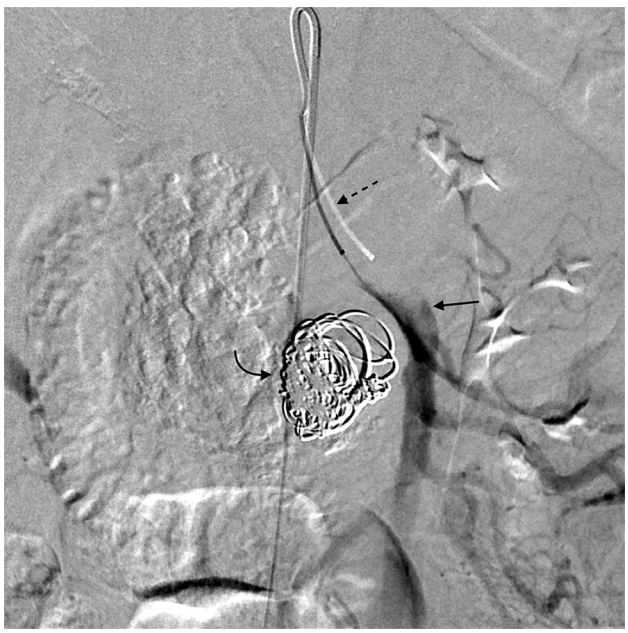

Fig. 4 Post-embolization angiogram: final angiogram post-embolization demonstrating a coiled mass in the pseudoaneurysm sac with no extravasation of contrast (curved arrow). Access was obtained through the superior mesenteric artery (solid straight arrow) into the pseudoaneurysm feeding vessel using a microcatheter (dashed straight arrow)

our patient had a pseudoaneurysm of the SMA, which is seen in < 5% of cases [14]. Hemosuccus pancreaticus results when pancreatic enzymes erode the arterial wall and forms a communication between the duct and a vascular structure, most often a pseudoaneurysm. Erosion of the splenic artery from chronic pancreatitis is common, because this tortuous vessel courses through the pancreas. We suspect that the SMA was affected in our patient, because the pancreatic inflammation was centered around the pancreatic head near the SMA as noted by the duodenitis on EGD and mass-like heterogeneous signal intensity in the head of the pancreas on MRI.

Symptoms of hemosuccus pancreaticus could range from intermittent occult bleeding to massive acute hemorrhage. Untreated massive bleeding has a mortality of approximately 90%, whereas for treated cases the mortality ranges from 25 to 37% [4]. The endoscopic diagnosis of hemosuccus pancreaticus is made by identifying bleeding from the main pancreatic duct. However, blood at the pancreatic ampulla on endoscopy is not always present, and according to one series more than 50% of cases were not diagnosed by endoscopy alone [15]. A sentinel clot, or clotted blood in the pancreatic duct, on pre-contrast CT is rarely seen and an opacified pancreatic duct may be observed on angiography [16]. The diagnosis of hemosuccus pancreaticus was made in our patient using a summation of evidence from EGD, MRI, and angiography. The pseudoaneurysm located centrally in the inflammatory pancreatic mass and communicating with the SMA was noted both on MRI and angiography. The patient's history of intermittent bleeding, a negative endoscopy except for duodenitis, and the presence of a pseudoaneurysm in the setting of chronic pancreatitis without additional sources of bleeding contributed to the diagnosis.

Surgery has historically been used to treat pseudoaneurysms, which can be life threatening if they rupture. Angiographic treatment options include coil embolization or exclusion of the pseudoaneurysms with stent grafts. As definitive treatment and primarily in hemodynamically stable patients, endovascular management has been found to be 79–100% effective with rates of re-bleeding ranging from 18 to 37% [17]. Our patient was definitively treated with coil and Gelfoam embolization, avoiding surgical intervention.

Visceral pseudoaneurysm can be deadly and is difficult to diagnose. It commonly arises in the setting of chronic pancreatitis and can mimic a pancreatic neoplasm [9]. Inaccurate diagnosis can lead to serious consequences in the form of unnecessary major surgery or bleeding from attempted biopsy. Given the evidence of SMA invasion suggested by biopsy in our patient, it is reasonable to assume the pseudoaneurysm was present at the time of the scheduled CT-guided percutaneous biopsy. Fortunately, serious hemorrhage was avoided, as the mass had decreased in size and the biopsy was aborted.

Despite being rare, visceral artery pseudoaneurysm should be considered in the setting of suspected pancreatic mass with inconsistent and unclear gastrointestinal hemorrhage. In addition to the possibility of a pseudotumor, a thrombosed arterial aneurysm can easily be interpreted as a pancreatic mass and may lead to unnecessary surgery [10, 11]. This unusual case highlights the importance of having a low threshold for repeat imaging and CT angiography in patients with chronic pancreatitis and gastrointestinal bleeding without a clear source.

Compliance with ethical standards

Conflict of interest Michelle Shnayder, M.D., M.P.H, and Prasoon Mohan, M.D., declare that they have no conflict of interest.

Research involving human and/or animal rights All procedures followed have been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments.

Informed consent Informed consent was obtained from all patients for being included in the study.

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