Hemosuccus Pancreaticus: A Rare Complication in Patients with Chronic Pancreatitis

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**Background:** Hemosuccus pancreaticus is pancreatic hemorrhage which passes via the pancreatic duct into the duodenum through the ampulla of Vater. It is a rare condition usually occurring in patients with a history of chronic pancreatitis and a pseudocyst. Exudation of pancreatic proteolytic enzymes leads to the gradual autodigestion of nearby vessel walls, resulting in the formation of a pseudoaneurysm. The pseudoaneurysm eventually ruptures into the pancreatic duct, directly or within a pseudocyst.

**Methods:** We report the case of a 45-year-old alcoholic male presenting with melena and complaints of intermittent epigastric pain. Upper endoscopy showed active bleeding from the ampulla of Vater. Chronic calcific pancreatitis and a pseudoaneurysm within a pancreatic pseudocyst were seen on computed tomography (CT) scan. These findings raised our concern for the diagnosis of hemosuccus pancreaticus and appropriate studies were performed.

**Results:** An angiogram was performed and showed a large bilobed pseudoaneurysm which filled from the gastroduodenal artery and from the inferior pancreaticoduodenal artery off the superior mesenteric artery. Extensive embolization was performed with subsequent resolution of contrast opacification of the pseudoaneurysm. The patient had no further episodes of gastrointestinal bleeding and was discharged from the hospital in stable condition.

**INTRODUCTION**

Hemorrhage from the pancreatic duct is a rare source of gastrointestinal bleeding and references to it in the medical literature remain mostly limited to case reports and short reviews, with about 100 cases identified to date (1,2). Since the first report by Lower and Farrel in 1931 (3), many terms have been used to describe the phenomenon, including wirsungorrhagia proposed by Vankemmel in 1969 (4). Hemosuccus pancreaticus was proposed by Sandblom in 1970 and hemoductal pancreatitis by Longmire and Rose in 1973 (5,6). Hemosuccus pancreaticus is a hemorrhage transferring via the pancreatic duct. It is a rare condition and usually occurs in patients with a history of chronic pancreatitis and pseudocyst. Exudation of pancreatic proteolytic enzymes leads to the gradual autodigestion of nearby vessel walls, resulting in the
formation of a pseudoaneurysm. The pseudoaneurysm can eventually rupture into the pancreatic duct, either directly or from within a pseudocyst. We report the case of a 45-year-old male with alcohol abuse who presented with upper gastrointestinal bleeding. The initial upper endoscopy showed bleeding from the ampulla’s of Vater. This hemobilia, raised concern for the diagnosis of hemosuccus pancreaticus (7). The diagnosis was subsequently confirmed by radiographic and angiographic imaging. To our knowledge, this article provides the first endoscopic images in the literature demonstrating active bleeding through ampulla of Vater from hemosuccus pancreaticus.

CASE REPORT

A 45-year-old Hispanic male presented with black tarry stools, which began ten days prior to admission lasting four days. He reported lightheadedness with ambulation and generalized weakness for one week. He gave a history of sharp epigastric pain lasting for three-to-five days, exacerbated by meals, and associated with non-bloody emesis occurring intermittently for one year. He admitted to drinking half a bottle of rum daily for 10 years, but denied a history of liver disease, prior ascites, encephalopathy, or overt gastrointestinal bleeding.

He had no other significant medical history or prior surgery. He had taken two ibuprofen earlier in the week before admission but denied chronic use of aspirin or non-steroidal anti-inflammatory medications. There was no family history of gastrointestinal malignancy or liver disease.

On physical examination, he was afebrile, blood pressure 115/84 mmHg and heart rate 90 beats per minute (bpm) while supine and 100/70 mmHg and heart rate 110 bpm while standing. Mild epigastric tenderness was elicited on palpation without rebound or guarding and bowel sounds were normoactive. Hepatosplenomegaly or fluid wave weren’t appreciated. Rectal exam revealed occult blood-positive brown stool and no perianal disease. The remainder of the physical examination was normal.

Laboratory studies revealed a white blood cell count of 6,900/mm³, Hemoglobin of 4.4 mg/dL, MCV of 68, RDW of 25, and platelet count of 225,000. The basic metabolic panel, including calcium, was normal. Liver chemistries demonstrated an alanine aminotransferase (ALT) of 26 U/L, aspartate aminotransferase (AST) of 27 U/L, and total bilirubin 1.0 mg/dL, direct bilirubin 0.4 mg/dL, INR of 1.4, and an albumin of 2.7 g/dL. Amylase was 28 U/L, and lipase was 22 U/L. Iron was 23, TIBC 531, and Ferritin was 7 with saturation of 7%.

He was transfused three units of packed red blood cells in the emergency room and demonstrated an appropriate response. Abdominal X-ray showed extensive calcifications in the left upper quadrant without evidence of free air.

Upper endoscopy showed edematous mucosa distal to the duodenal bulb resulting in slight narrowing of the lumen, suggestive of extrinsic compression. There was active bleeding emanating through a normal appearing ampulla of Vater, which persisted despite aggressive irrigation (Figures 1A, 1B). The remainder of the upper gastrointestinal tract was normal.

An emergent computed tomography (CT) of the abdomen with oral and intravenous (IV) contrast was performed. This demonstrated a 4 cm fluid collection within the pancreatic head with a 2.5 cm central hyperdensity, consistent with a pseudoaneurysm with active bleeding within a pancreatic pseudocyst. (Figure 2). The imaging was also notable for evidence of chronic calcific pancreatitis.

Emergent angiography followed and demonstrated a large bilobed pseudoaneurysm, which filled from the gastroduodenal artery (GDA) and from the inferior pancreaticoduodenal artery (PDA) off the superior mesenteric artery. Extensive microcoil and glue embolization of the GDA and proximal inferior PDA was performed, with subsequent resolution of contrast opacification of the pseudoaneurysm.

DISCUSSION

Frequency and Causes

Hemosuccus pancreaticus has been estimated to occur in about one in 1,500 cases of gastrointestinal hemorrhage (1). Bleeding from the pancreatic duct has been most commonly attributed to visceral artery pseudoaneurysms (40%) (8). Chronic and acute pancreatitis
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are the most common cause of pseudoaneurysms arising from the peripancreatic arteries (9). Pseudoaneurysms have been reported in up to 10% of patients with chronic pancreatitis, with rupture in 2%–10% (10,11). The most commonly involved vessels include the splenic, hepatic, gastroduodenal, and pancreaticoduodenal arteries (12–14). Other unusual causes of bleeding from the pancreatic duct include pancreatic lithiasis (1,15,16), pancreatic tumors (i.e. cystadenocarcinoma, osteoclastoma, and villous adenomatosis) (8,17,18) arteriovenous malformations (8), and pancreas divisum with chronic pancreatitis (19).

Pathogenesis

The development of pseudoaneurysms from peripancreatic arteries is associated with digestion of the arterial wall by pancreatic enzymes. The pathogenesis of intrapseudocystic hemorrhage is believed to involve the following: (1) pancreatic enzymes, activated by reflux of enterokinase from the duodenum, digests small vessels in the wall of the pseudocyst; (2) elevation of intrapseudocystic pressure causes injury of small vessels in the wall; and (3) a peripancreatic pseudoaneurysm ruptures into the pseudocyst (20).

Clinical Presentation

The typical presentation includes abdominal pain and gastrointestinal bleeding. Pain is the rule rather than the exception and is thought to be caused by increased intraductal pressure due to blood in the main duct (1,7). Clay, et.al emphasized the fact that crescendo-decrescendo epigastric pain is a characteristic in approximately half of the patients as result of consecutive distention and decompression of the pancreatic duct by blood and clot and can be an important clue in making the diagnosis (21). Intermittent bleeding is typical of hemosuccus pancreaticus, and therefore, active bleeding may not be seen at the time of endoscopy (21,22). Presumably, as blood enters the pancreatic duct or pseudocyst, it thromboses which causes a temporary tamponade. As the intraductal or intracystic clot subsequently lyses, hemorrhage reoc-

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Ampullary papilla the diagnosis of hemobilia or of hemosuccus pancreaticus is secure; when blood is seen in the second portion of the duodenum without an obvious source in the clinical setting described, the diagnosis of hemosuccus pancreaticus must be entertained (7,26). Generally upper gastrointestinal endoscopy isn’t successful in confirming the diagnosis of hemosuccus pancreaticus (26). In our patient, we were fortunate to visualize active bleeding from the ampulla of Vater at endoscopy.

Endoscopic retrograde cholangiopancreatography (ERCP) using a side-viewing endoscope can also help to visualize blood at the ampulla of Vater or clots within a dilated duct system (27,28). CT and ultrasound with doppler flow has been used to reveal the presence of a false or true aneurysm, pseudocyst, and signs of chronic pancreatitis or other pathology (29–31). 99m-Tc-labeled red cell scintigraphy has also been useful if it is performed during a period of active bleeding (7).

Angiography represents the optimal imaging modality for suspected hemosuccus pancreaticus, as it can detect causes of hemobilia in a majority of cases. Although the definitive demonstration with intravascular contrast of a communication between a peripancreatic vessel and the pancreatic duct is exceedingly unusual (32, 33) the finding of pseudoaneurysm of the splenic, gastroduodenal, or common hepatic artery in a patient with an undiagnosed source of upper GI bleeding, especially in a patient with chronic pancreatitis, is certainly suggestive of hemosuccus pancreaticus (21).

Treatment

The treatment of hemosuccus pancreaticus includes interventional radiological (IR) procedures and surgical resection or ligation of bleeding vessels. IR methods are commonly used as initial management (12). Two IR techniques can be used: Embolization of prosthetic material (i.e. microcoil, glue) and balloon tamponade. Embolization of peripancreatic aneurysms has been performed with 79% success rate (11). It remains a matter of debate whether embolization should be followed by surgery or if it is the definitive treatment. Surgical treatment is indicated in uncontrolled or recurrent hemorrhage, persistent shock, or when
embolization is not feasible (33) Definitive surgical treatment depends upon the cause and location of bleeding, as well as co-existing medical comorbidities. When the aneurysm arises from the splenic artery, distal pancreatectomy is the preferred treatment. When the aneurysm involves the head of the pancreas, a major resection like pancreaticoduodenectomy may be necessary (7). If pancreatic resection is contraindicated, transcystic ligation of the arterial source may be used when a pseudocyst is present. In the absence of a pseudocyst, exclusion of the pseudoaneurysm is the best approach (7).

CONCLUSION

We provide a case report with endoscopic and radiographic images supporting the diagnosis of hemosuccus pancreaticus in a patient with chronic pancreatitis due to alcohol abuse. This rare but important entity was diagnosed with endoscopic retrograde cholangiopancreatography images supporting the diagnosis of hemosuccus pancreaticus in a patient with chronic pancreatitis. We provide a case report with endoscopic and radiographic images supporting the diagnosis of hemosuccus pancreaticus in a patient with chronic pancreatitis. In conclusion, hemosuccus pancreaticus should be considered in the differential diagnosis of unusual causes of gastrointestinal bleeding.

REFERENCES


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