Detecting Vascular Complications of Pancreatitis in the Emergency Setting: the Common, the Obscure and the Deadly

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Learning Objectives:
• Review the various vascular complications related to pancreatitis including:
  1. Pseudoaneurysm and rupture.
  2. Occult pancreatic duct bleeding (hemosuccus pancreaticus).
  3. Duodenal hemorrhage.
  4. Splenic venous thrombosis.
• Describe the potential treatment options and role for interventional radiology.

Target Audience: ER radiologists, radiology residents

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No financial disclosures.
Pseudoaneurysm

- Pancreatitis can result in a variety of vascular complications.
- Severe hemorrhage is a complication that as been reported as high as 6.7% in a retrospective series of 541 patients (Bergert et al.)
- **Pseudoaneurysm** is the most common cause of hemorrhage.
- Splenic artery > pancreaticoduodenal > gastroduodenal.
- Hemorrhage can occur into GI tract, peritoneum, retroperitoneum or into pseudocysts.

- Top CT images (a, b) demonstrate a large **pseudoaneurysm** with expansion into the splenic hilum. Note: pancreatic calcifications and pancreatic ductal dilation with intraluminal calculi consistent with chronic pancreatitis.
- Bottom CTA images (c, d) obtained 9 hours later after clinical deterioration demonstrate active extravasation from pseudoaneurysm with new **hemoperitoneum**.
- DSA image from celiac artery angiogram (e) demonstrates active extravasation from the splenic artery which was subsequently coiled.
Hemosuccus pancreatitis

- A 60-year-old male patient with history of pancreatitis presented with upper GI bleeding. Hemosuccus pancreaticus was identified on upper GI endoscopy.

- Axial (top) and coronal (bottom) CT images from CTA of the abdomen demonstrate calcifications within the pancreatic head and uncinate process indicating chronic pancreatitis. Additionally, there is a pseudoaneurysm in the pancreatic head, which was successfully embolized.

- Rare cause of upper GI bleeding via the ampulla of Vater via the pancreatic duct.
- Most commonly due to rupture of splenic artery aneurysm into pancreatic duct.
- Oftentimes can be a difficult diagnosis given intermittent bleeding, so having a high suspicion is vital.
Patient presented with acute on chronic pancreatitis. Coronal noncontract (left) demonstrates hyperdense thickening of the first and second portions of the duodenum consistent with hematoma. Contrast-enhanced axial (middle) and coronal (right) images remonstrate the duodenal wall thickening. Notable, no evidence of aneurysm or active extravasation.

- Duodenal hemorrhage is a rare entity, most commonly seen in pediatric blunt abdominal trauma, or less commonly in the setting of anticoagulation.
- Pancreatitis-related duodenal hemorrhage has been rarely reported in the setting of pancreatitis.
Splenic Vein Thrombosis and Gastric Varices

- Venous thrombosis is a well-recognized complication of acute pancreatitis.
- Pathophysiology believed to result from stasis, spam and mass effect from surrounding inflammation.
- Series of 100 patients reported rates of thrombosis of splenic vein (19%) > superior mesenteric vein (14%) > portal vein (13%).
- Venous thrombosis $\rightarrow$ varices formation $\rightarrow$ can result in severe hemorrhage.

Axial image (left) demonstrates multiple gastric varices. Coronal images (middle) demonstrates splenic vein filling defect and atrophy of the pancreatic body. Right coronal image again shows multiple gastric varices in a patient with pancreatitis.

Selected References