Case 10218

Splanchnic Hypertension following a Whipple Procedure - Interdisciplinary approach
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Section: Interventional radiology
Area of Interest: Abdomen Contrast agents
Gastrointestinal tract Interventional vascular Liver
Procedure: Imaging sequences
Procedure: Endoscopy
Procedure: Diagnostic procedure
Procedure: Stents
Procedure: Embolisation
Procedure: Cholangiography
Technique: CT-Angiography
Technique: PACS
Technique: Catheter venography
Technique: CT
Technique: Catheter arteriography
Technique: Ultrasound
Special Focus: Neoplasia Obstruction / Occlusion
Case Type: Clinical Cases
Authors: Gomes AP, Guedes Pinto E, Sousa MD Rocha R, Rosa L, Appleton T, Pignatelli N, Nunes VM.
Patient: 49 years, male

Clinical History:

A 49 year old male with previous history of cystojejunostomy for pancreatic pseudocyst was diagnosed in a follow up evaluation with a non-invasive intraductal papillary mucinous carcinoma of the head of the pancreas. Two years after pancreatoduodenectomy he was admitted in the emergency room with massive haematemesis and shock.

Imaging Findings:

A cystic mucinous neoplasm of the head of the pancreas was diagnosed after a CT scan and transduodenal puncture guided by endoscopic ultrasound (Fig. 1-3). Two years after surgery he was admitted in the ER with massive haematemesis and shock due to gastric varices with signs of recent hemorrhage but with no active bleeding (Fig. 4). CT revealed thrombosis of the superior mesenteric vein (SMV) with extensive collateral drainage by the greater omentum and splenic veins, latter confirmed by DSA (Fig. 5). A mesenteroportal stent was placed (Fig. 6). Two years later he was readmitted by massive haematemesis due to actively bleeding gastroesophageal varices. Angio-CT revealed patency of the mesenteroportal stent, splenic vein thrombosis, splenomegaly and intense collateral perisplenic and perigastric circulation (Fig. 7). Selective proximal splenic artery embolization with coils was
successful (Fig. 8) and he has been asymptomatic since with no evidence of malignant recurrence (Fig. 9).

Discussion:

Superior mesenteric vein (SMV) thrombosis is a rare event with unspecific clinical signs and symptoms, which typically delays the diagnosis. In the acute onset, abdominal pain is prominent and there is a risk of bowel infarction and abdominal sepsis. In the chronic forms, patients are often asymptomatic [1]. With an insidious onset, collateral venous drainage can be seen through the spleen, duodenal and gastric veins. This can minimize the bowel oedema and ischaemia, being the patients almost asymptomatic. On the other hand, collateral venous drainage may be responsible for oesophageal or gastric varices. Thus, upper gastrointestinal (GI) bleeding can be the first manifestation of chronic SMV thrombosis [2-4].

This case reports a chronic SMV thrombosis two years after cephalic pancreatoduodenectomy, with massive upper GI bleeding as the first clinical evidence. The known risk factors were the two previous abdominal surgeries (two and five years before) and a previous episode of acute pancreatitis (five years before). He was a non-smoker and haematologic study for pro-coagulation disorders was negative.

This case reflects an unusual pathophysiology for upper GI bleeding, where venous hypertension secondary to the superior mesenteric vein and later also splenic vein thrombosis led to an extensive perigastric collateral venous flow and varicose gastric and oesophageal veins. The option for endoluminal thrombolysis and stenting tries to re-establish the normal physiology of venous drainage.

Long-term anticoagulation is recommended for venous thrombosis in patients with primary pro-thrombotic disease. Since our patient had thrombocytopenia, upper GI bleeding and the stent was placed in a large vein it was decided not to use oral anticoagulation. A second episode of massive upper GI bleeding was due to collateral varices secondary to splenic vein thrombosis. Splenic artery was selectively embolized diminishing the splenic vein input, as described in other case reports [2-7]. Spleen preservation was important, since it works as a splanchnic reservoir and a pressure tampon.

In this patient the interventional radiologic procedure was effective. A surgical approach, with emergent gastric resection, as it was initially considered in the ER for the upper GI bleeding with shock would remove collateral circulation, the main pathway for splanchnic venous return, probably with a worst prognosis. The effective interdisciplinary discussion, involving gastroenterology, surgery and interventional radiology was likely the main factor for the success in this case.

Differential Diagnosis List: gastroesophageal varices due to SMV oclusion, Chronic Liver Disease with hypertension, Peptic ulcer disease

Final Diagnosis: gastroesophageal varices due to SMV oclusion

References:

Interventional Radiology 20(12):1633-1637
Description: Two years follow up abdominal CT scan with venous contrast showing a cystic lesion in the head of the pancreas (arrow). Origin: Department of Radiology, Hospital Fernando Fonseca, E.P.E., Portugal
Figure 2

Description: Endoscopic ultrasonography transduodenal puncture showing a cystic lesion with 2.8 by 2.2 cm, with multiple septa and intracystic vegetations. A thick mucous fluid was successfully drained.

Origin: Department of Gastro-enterology, Hospital Fernando Fonseca, E.P.E., Portugal
**Description:** Mucinous cystic tumor with foci of adenocarcinoma. H&E 10x papillary and oncocytic epithelial cells lining a pancreatic duct. **Origin:** Department of Anatomo-Pathology, Hospital Fernando Fonseca, E.P.E., Portugal.
Description: Emergent esophagogastroscopy showing gastric varices with no active bleeding but with stigma of recent bleeding. Origin: Department of Gastro-enterology, Hospital Fernando Fonseca, E.P.E., Portugal
**Description:** Transhepatic portal venous angiography showing an almost occlusive superior mesenteric vein thrombosis (encircled). **Origin:** Department of Radiology, Hospital Fernando Fonseca, E.P.E., Portugal
Description: Transhepatic portal venous angiography after placing a portomesenteric stent. Origin: Department of Radiology, Hospital Fernando Fonseca, E.P.E., Portugal.
Description: Abdominal CT scan showing extensive perigastric and periesplenic collateral venous flow, splenomegaly and partial thrombosis of the splenic vein. Origin: Department of Radiology, Hospital Fernando Fonseca, E.P.E., Portugal
Figure 8

Description: Proximal selective splenic artery embolization with coils (encircled). Origin: Department of Radiology, Hospital Fernando Fonseca, E.P.E., Portugal
Description: Nowadays esofagogastroscopy showing esophagogastric varices. Origin: Department of Gastro-enterology, Hospital Fernando Fonseca, E.P.E., Portugal