Acute superior mesenteric vein thrombosis and intestinal ischemia in liver cirrhosis
Published on 03.02.2016

DOI: 10.1594/EURORAD/CASE.13359
ISSN: 1563-4086
Section: Abdominal imaging
Area of Interest: Abdomen Small bowel
Procedure: Contrast agent-intravenous
Imaging Technique: CT
Special Focus: Cirrhosis Ischaemia / Infarction Case
Type: Clinical Cases
Authors: Joelin Teh, Uditha Wijesinghe, Richard Ho
Patient: 68 years, male

Clinical History:
A 68-year-old man with liver cirrhosis presents with a 10 day history of vague abdominal pain, intermittent constipation and elevated serum lactate. Routine surveillance contrast-enhanced abdominal CT performed 14 days prior demonstrated a macro-nodular liver with evidence of portal hypertension without any acute intra-abdominal pathology.

Imaging Findings:
Contrast-enhanced CT demonstrated diffuse hypoattenuation and wall thickening of the ileum, ascending and transverse colon with mesenteric stranding, vascular engorgement and ascites. A loop of ileum demonstrated the fat halo sign. Gallbladder wall oedema was thought to be secondary to the background liver cirrhosis rather than representing acute cholecystitis. An incomplete well-defined intra-luminal filling defect was detected in the superior mesenteric vein. Absence of luminal enhancement and mesenteric stranding was also demonstrated distally involving the jejunal, ileocolic, right colic and middle colic branches without collateral circulation. The main portal vein was patent on CT and this was confirmed on Doppler ultrasound the following day.

Discussion:
Acute mesenteric venous thrombosis is uncommon and accounts for 5-10% of cases of acute bowel ischemia [1]. Portal hypertension and liver cirrhosis are recognized aetiologies, with thrombosis occurring spontaneously, in the setting of hepatocellular carcinoma or post-splenectomy for splenomegaly. Its prevalence in cirrhotic patients has been attributed to a hypercoagulable state, contrary to previous belief of an increased bleeding tendency in these patients [2]. The superior mesenteric vein is not as frequently involved compared to the main portal vein or its intra-hepatic branches.

Intestinal ischemia secondary to venous occlusion commonly presents with vague colicky abdominal pain that may have been present for a few days. Some patients may be asymptomatic or present with peritonitis secondary to bowel necrosis and perforation.

Contrast-enhanced CT has greater than 90% sensitivity in diagnosing mesenteric venous obstruction with visualisation of the thrombus in the mesenteric and portal veins [3]. CT findings of bowel ischemia include bowel wall thickening with absent or diminished enhancement, hyper-enhancement or a “halo” pattern of contrast.
enhancement. This may be associated with pneumatosis or hepatic portal venous gas. Mesenteric stranding and engorgement along with ascites are common findings but do not correlate with the degree of bowel ischemia [4].

Currently, there remains a lack of consensus for the treatment of mesenteric venous thrombosis in liver cirrhosis. Management is often guided by the patient’s clinical presentation and includes surgical exploration and resection of infarcted bowel, systemic anticoagulation for clinically stable patients or thrombectomy and transjugular intrahepatic portosystemic shunts (TIPS) as second-line options.

A high index of suspicion is required for the diagnosis of acute mesenteric venous thrombosis given its non-specific and variable clinical manifestation. The ability of contrast-enhanced CT to detect vascular occlusions and bowel wall changes, along with its widespread availability lends itself to being a key imaging modality for the diagnosis of acute intestinal ischemia. Accurate and early diagnosis, as well as timely management is necessary to reduce patient morbidity and mortality. In this case, systemic anticoagulation and bowel rest was initiated with good clinical response.

**Differential Diagnosis List:** Acute superior mesenteric thrombosis with intestinal ischemia secondary to liver cirrhosis, Pylephlebitis secondary to enterocolitis, Inflammatory bowel disease complicated by SMV thrombosis

**Final Diagnosis:** Acute superior mesenteric thrombosis with intestinal ischemia secondary to liver cirrhosis

**References:**


Description: Coronal reformats demonstrated an incomplete intra-luminal filling defect within the superior mesenteric vein (white arrow). The splenic vein (red arrow) and visualised main portal vein is patent. The liver is cirrhotic and there is ascites. Origin: Department of Radiology, Royal Perth Hospital, Perth, Western Australia, Australia
Description: Axial CT confirmed a thrombus within the superior mesenteric vein. There is hypoattenuation of the ileum and ascending colon with mesenteric stranding and ascites consistent with intestinal ischemia. Origin: Department of Radiology, Royal Perth Hospital, Perth, Western Australia, Australia.
**Description:** CT performed 14 days prior showed a patent main portal vein, superior and inferior mesenteric veins. The liver is cirrhotic with no evidence of ascites. **Origin:** Department of Radiology, Royal Perth Hospital, Perth, Western Australia, Australia.
**Description:** Intra-luminal defects are present within the visceral branches of the superior mesenteric vein with adjacent mesenteric fat stranding and engorgement. There is hypoattenuation of the jejunal loops and ascending colon. **Origin:** Department of Radiology, Royal Perth Hospital, Perth, Western Australia, Australia.
Description: A loop of ileum demonstrated the fat halo sign seen in bowel ischemia - submucosal inflammation (low attenuation inner layer) surrounded by high-attenuation hyperemic outer layer. Origin: Department of Radiology, Royal Perth Hospital, Perth, Western Australia, Australia.