Spleno-portal venous thrombosis in ulcerative colitis
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Section: Abdominal imaging
Area of Interest: Colon Veins / Vena cava
Procedure: Complications
Imaging Technique: CT
Imaging Technique: Ultrasound-Colour Doppler
Special Focus: Acute Embolism / Thrombosis Case
Type: Clinical Cases
Authors: Tonolini M, Petullà M
Patient: 22 years, male

Clinical History:
Young male patient affected with subtotal Ulcerative Colitis (UC) without previous surgical interventions, treated until recently with multiple medications including steroids, infliximab and azathioprine.
Hospitalised because of fever (38° C) and abdominal pain for one week. Tenderness at palpation without peritonism, audible peristalsis at physical examination.

Imaging Findings:
At Emergency Department admission, unremarkable plain abdominal radiographs (not shown) excluded toxic megacolon. Laboratory tests disclosed anaemia (Hb 8.6 g/dL), decreased White Blood Cell count (3.400/mmc) and platelets (68.000/mmc), raised C-Reactive Protein (40 U/l).
Urgent contrast-enhanced MDCT was requested to investigate clinical diagnosis of acute UC re-exacerbation. In the pelvis minimal ascites was present. The collapsed rectosigmoid and descending colon demonstrated enhancing mural thickening corresponding to clinical and endoscopic active UC. Mild, homogeneously enhancing splenomegaly was present, with unexpected finding of a large filling defect consistent with thrombosis in the dilated distal splenic vein. Multiple partial thromboses were seen also in the intrahepatic portal vein branches whereas the main trunk, olive and mesenteric vein appeared patent.
Anticoagulation was started: one week later, colour Doppler ultrasound did not detect significant residual thrombosis involving the splenic vein, portal trunk and main branches. Subsequently, restorative proctocolectomy was performed because of refractory UC.

Discussion:
Ulcerative Colitis (UC) patients have increased risk of developing venous thrombosis, and thromboembolism represents a significant cause of morbidity and mortality particularly in the perioperative setting [1-3]. Although uncommon, portal venous system thrombosis (PVST) is increasingly recognised as a serious complication of UC with an estimated 0.1-1% overall prevalence. Pathogenesis includes multiple factors such as chronic hypercoagulability, thrombocytosis, abdominal sepsis and recent surgical trauma to abdominal veins. PVT may develop during both acute exacerbations and clinical remission, whereas overall postoperative incidence of PVST has been reported to approach 5% of UC patients after proctocolectomy [2-5]. Sometimes minimal or even absent, clinical manifestations are usually nonspecific including abdominal pain or discomfort, fever, abnormal laboratory inflammation markers and liver enzymes, possible positive blood cultures:
therefore both clinicians and radiologists should maintain a high level of suspicion not to miss this important diagnosis [5, 6].

Unrecognised PVST may lead to long-term development of cavernomatous transformation or portal hypertension, and possible life-threatening complications such as digestive tract bleeding and splenic rupture. Conservative treatment is usually successful, including intravenous antibiotics coupled with plasminogen activators or heparin anticoagulation. Proctocolectomy has been reported to cure PVST, but a higher incidence of postoperative pouchitis is associated with PVST. Invasive thrombolytic therapies such as transhepatic intraportal fibrinolysis have been attempted in refractory cases [3, 4, 6, 7].

Following proctocolectomy in UC patients, MDCT is frequently requested (in up to 25% of operated patients) during early postoperative hospital stay to investigate clinical complaints (such as persistent pain and/or fever, ascites or ileus) or laboratory abnormalities, to rule out possible complications. In patients imaged with CT, PVST has been detected in as much as 39-45% of postoperative UC patients [3, 7]. Contrast-enhanced MDCT allows comprehensive visualisation of the spleno-portal-mesenteric system and detection of opacification defects consistent with thrombosis, often involving multiple sites. Radiologists should be aware of the possibility of PVST when imaging patients with UC, particularly during acute exacerbations (such as in this patient) or early postoperative period, and carefully scrutinise the spleno-porto-mesenteric venous system to identify subtle thromboses, since some surgical reports indicated a significant proportion of missed PVST during initial interpretation of postoperative CT examinations [7, 8]. Although non-invasive, colour Doppler ultrasound lacks panoramicity compared to CT and the ability to assess small intrahepatic portal branches, and may be helpful to initially detect extensive thromboses or to monitor PVST during treatment, to avoid irradiation from repeated CT.

**Differential Diagnosis List:** Multifocal spleno-portal venous thrombosis in ulcerative colitis, Crohn’s disease, Chronic liver disease / cirrhosis, Hepatocellular carcinoma, Pylephlebitis, Hypercoagulability state, Abdominal sepsis

**Final Diagnosis:** Multifocal spleno-portal venous thrombosis in ulcerative colitis

**References:**


**Figure 1**

**a**

**Description:** In the pelvis minimal ascites is present. Collapsed rectosigmoid colon shows enhancing mural thickening corresponding to clinical and endoscopic diagnosis of active ulcerative colitis. **Origin:**
Tonolini M, Department of Radiology, “Luigi Sacco” University Hospital – Milan (Italy)

**b**

**Description:** Dilated splenic vein shows large filling defect consistent with thrombosis. Multiple partial thromboses (arrowheads) are seen in the intrahepatic branches of the portal vein, with patent main trunk and olive. **Origin:**
Tonolini M, Department of Radiology, “Luigi Sacco” University Hospital – Milan (Italy)
**Description:** Dilated splenic vein shows large filling defect consistent with thrombosis. Multiple partial thromboses (arrowheads) are seen in the intrahepatic branches of the portal vein, with patent main trunk and olive. **Origin:** Tonolini M, Department of Radiology, “Luigi Sacco” University Hospital – Milan (Italy)

**Description:** Multiple, partly subtle partial thromboses (arrowheads) are seen in the intrahepatic branches of the portal vein, with patent main trunk and olive. **Origin:** Tonolini M, Department of Radiology, “Luigi Sacco” University Hospital – Milan (Italy)
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**Figure 2**

**a**

**Description:** After anticoagulant therapy, CDUS excludes significant residual thrombosis of the portal vein and of its main branches. **Origin:** Tonolini M, Department of Radiology, "Luigi Sacco" University Hospital – Milan (Italy)

**b**

**Description:** Splenic vein appears patent with normal spectral waveform. **Origin:** Tonolini M, Department of Radiology, "Luigi Sacco" University Hospital – Milan (Italy)