

SUPERIOR MESENTERIC VEIN THROMBOSIS

BACKGROUND

- Mesenteric ischemia is characterized by inadequate blood flow to or from the involved mesenteric vessels supplying a particular segment of bowel. Mesenteric venous thrombosis is a rare but lethal cause of mesenteric ischemia that has an insidious onset with a high mortality rate typically attributed to the long delay in diagnosis.
- The diagnosis of mesenteric ischemia often is a challenge; patients with inflammatory bowel disease and infectious colitis can present with similar physical signs and symptoms, including cramping abdominal pain, diarrhea, leukocytosis, and hematochezia (1).

PATHOPHYSIOLOGY

- Venous cases of bowel ischemia result from decreased mesenteric outflow of deoxygenated blood rather than from decreased perfusion of oxygen-rich blood:
 - particular cause of venous ischemia in a patient is not clear in 25 – 50% of cases.
 - predisposing risk factors associated with thrombosis include recent abdominal surgery, infection, hypercoagulable states (eg, polycythemia vera, protein C and S deficiencies), OCP use, (2,3,4), and patients with IBD (Fichera and colleagues from MSSM,4).

INCIDENCE

- MVT accounts for 10-15% of all cases of mesenteric ischemia → this accounts for 0.006% of hospital admissions, and venous thrombosis is found in 0.001% of patients who undergo exploratory laparotomy.

CLINICAL PRESENTATION

Irrespective of etiology, four clinical stages are usually recognized. In venous thrombosis the progression of symptoms can take 7-10 days following the thrombosis:

- Hyperactive stage:
 - intermittent severe pain
 - passage of loose stools with blood
 - vomiting
 - hyperactive bowel sounds on auscultation
- Paralytic stage:
 - pain becomes more continuous and diffuse
 - size of the abdomen increases, it becomes generally tender, and
 - there are no bowel sounds at auscultation
- Stage of disarranged fluid balance:
 - massive fluid loss is usually massive
 - bowel necrosis → peritonitis
- Shock stage: IRREVERSIBLE!

RADIOGRAPHIC FINDINGS

Unless the patient is unstable, imaging is the criterion standard for diagnosis.

- Upright and supine plain abdominal x-rays should be requested first to evaluate for free air/perforation, obstruction/dilatation, or the presence of mucosal edema
- Eventually, CT scan by using oral and, preferably, IV contrast material is needed.
 - CT is the primary imaging modality, as it is highly accurate in the diagnosis of mesenteric ischemia and can sometimes depict the underlying etiology.
 - Typically, CT scans show mesenteric edema with irregular thickening of the wall of the small or large bowel of greater than 3 mm.
 - A reliable method to differentiate arterial causes from venous causes is depiction of the characteristic bowel-wall enhancement pattern.
 - Arterial occlusive disease demonstrates no enhancement of the involved segment, whereas venous occlusion reveals marked contrast enhancement and retention secondary to stagnant flow (5).
- Doppler ultrasonography is not useful in evaluating mesenteric ischemia caused by venous abnormalities, and angiography is not sensitive in the diagnosis of mesenteric ischemia.

TREATMENT

- Medical therapy:
 - Investigate for underlying cause for the patient's condition.
 - Supportive measures should be instituted.
- Surgical therapy:
 - Surgery is only required in patients with signs of bowel infarction or peritonitis. (Chronic mesenteric ischemia resulting from poor collateral circulation is not a surgical emergency and may be treated conservatively).
 - Immediately begin anticoagulation therapy preoperatively. Anticoagulation therapy with intravenous heparin should be continued intraoperatively. Patients should have heparin anticoagulation continued postoperatively to reduce thrombotic events. Studies have shown that over 60% of cases of re-thrombosis of the mesenteric vein occur at the site of reanastomosis, probably because of local thrombotic factors (6).
 - Start all patients on broad-spectrum antibiotic therapy before the operation.
 - Reports of diagnostic laparoscopy in patients with venous thrombosis suggest this modality may have some use in preventing fruitless laparotomies in these patients; however, the decreased mesenteric blood flow that occurs with laparoscopy may worsen bowel ischemia.
 - When laparotomy reveals acute venous thrombosis (via visualization of hemorrhagic, edematous bowel), surgically remove the involved bowel and reanastomose the remaining bowel. Patients with severe intestinal loss due to mesenteric venous thrombosis may be considered for intestinal transplantation in specialized centers.

PROGNOSIS

- Acute venous thrombosis has a 30% mortality rate with a 25% recurrence rate without anticoagulant therapy.
- Anticoagulant therapy combined with surgery is associated with the lowest recurrence rate (3-5%) (6).

- Of all etiologies of mesenteric ischemia, venous thrombosis carries the best prognosis.

THROMBOEMBOLISM AND IBD

- Increased incidence of thromboembolism in inflammatory bowel disease has become a recognized association and potential cause of morbidity in IBD patients in recent years:
 - Fichera et al from MSSM, retrospectively evaluated the incidence of postoperative symptomatic SMV thrombosis in patients undergoing colon resections for IBD.
 - For those who developed postop acute abdominal pain, a CT scan was obtained.
 - When a diagnosis of SMV thrombosis was made, a complete coagulation profile was obtained. Those patients then began taking systemic anticoagulation for a minimum of 6 months with a follow-up CT.
 - Of the 83 patients in the study, 4 were diagnosed with SMV thrombosis. After anticoagulation therapy, all 4 became asymptomatic with full recovery.
 - Direct surgical trauma to the middle colic veins, with resulting thrombosis and clot propagation into the SMV and portal vein, was thought to be the precipitating factor.
 - The study demonstrated that the incidence of SYMPTOMATIC, CT-proven, postop SMV thrombosis in IBD patients after colectomy is significantly higher than in previous reports. It also indicated that prompt diagnosis and anticoagulation can avert the need for additional bowel resections because it prevents recurrent thrombotic episodes and allowed them to perform additional uneventful major abdominal surgeries in 2 of those patients.





RESOURCES

- Fichera A, Cicchiello LA, et al. SMV thrombosis after colectomy for IBD: a not uncommon cause of postoperative acute abdominal pain. *Dis Colon Rectum* 2003; 46:643-648.
- Ross AS, Gasparaitis A, et al. SMV thrombosis after colectomy in a patient with Crohn's Disease. *Gastroen and Hepatol* 2005; 2:281-285.

REFERENCES

- Bulkley GB, Haglund U, Morris J. Mesenteric Blood Flow and the Pathophysiology of Mesenteric Ischemia. *Vascular surgical emergencies* 1987. Grune and Stratton Inc., Orlando, p 24-51.
- Grendell JH, Ockner RK. Mesenteric Venous Thrombosis. *Gastroenterology* 1982; 82:358-372.
- Kitchens, CS. Evolution of our Understanding of the Pathophysiology of Primary Mesenteric Venous Thrombosis. *Am Jour Surg* 1992; 163:346-348.
- Hatoum OA, Spinelli KS, et al. Mesenteric Vein Thrombosis in IBD. *Jour Clin Gastroen* 2005; 39:27-31.
- Bradbury MS, Kavanagh PV, Bechtold RE, et al: Mesenteric venous thrombosis: diagnosis and noninvasive imaging. *Radiographics* 2002 May-Jun; 22(3): 527-41.
- Mathews JE, White RR. Primary Mesenteric Venous Occlusive Disease. *Am Jour Surg* 1971; 122:579-583.

Zalekha Shair, MS IV, NYMC
September 8, 2005