

Acute Inferior Mesenteric Venous Thrombosis in a Child

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Abstract

Inferior mesenteric venous thrombosis is a very rare condition with serious management challenge, especially in a resource-poor environment. The acute variety is associated with high morbidity and mortality, especially if there are accompanying bowel infarction and peritonitis. The case of a 12-year-old boy was referred from a private hospital after a failed attempt at appendectomy. The patient presented with features of generalized peritonitis and severe sepsis. Exploratory laparotomy after optimization showed massive hemorrhagic ascitic fluid, extensive left colonic gangrene extending from distal transverse colon to the sigmoid colon, and thrombosis in the branches of the inferior mesenteric vessel. The patient died 36 h postoperatively at the intensive care unit. A high index of suspicion and early bowel resection in cases of associated bowel infarction will improve outcome.

Keywords: Inferior mesenteric vein, morbidity, mortality, thrombosis

INTRODUCTION

Anatomically, the mesenteric veins (superior and inferior) follow the arterial distribution. The superior mesenteric vein (SMV) drains from the second part of the duodenum to the proximal two-thirds of the transverse colon, whereas the inferior mesenteric vein (IMV) drains the left part of the colon.^[1,2] The IMV empties into the splenic vein, and the SMV joins the splenic vein behind the neck of the pancreas to form the portal vein.^[1,2]

Mesenteric vascular thrombosis could be arterial or venous. Mesenteric venous thrombosis could be acute with sudden onset of symptoms, intermediate with symptoms appearing in days to weeks, or chronic with much later manifestation of symptoms.^[1] Mesenteric venous thrombosis is a very rare condition, seen 1 in 5000–15,000 inpatient admissions and 1 in 1,000 emergency department admissions.^[2-5] About 6%–9% of all cases of mesenteric venous thrombosis are acute in nature.^[2,6] The mesenteric venous thrombosis is more commonly seen in SMV, whereas IMV thrombosis, for unknown reasons, accounts only for 0%–11% of cases of MVT.^[1,6,7] The IMV thrombosis is relatively rare in general and even rarer in children.^[7,8] The peak age for MVT, in general, is between 40 and 60 years.^[1,2] Inferior mesenteric venous thrombosis, however, carries a very high mortality risk of 15%–23%.^[4,9,10]

This study aims at presenting the management challenges in a child with generalized peritonitis resulting from extensive gangrene of the left colon.

CASE REPORT

A 12-year-old boy was brought to the accident and emergency department of our hospital from a private hospital, with a 3-day history of central abdominal pain that became generalized. The patient has had an attempted appendectomy at the referring private hospital which was abandoned because the operating doctor found unusual abdominal masses and an outpouring of large amount of hemorrhagic ascites. Physical examination showed an acutely ill-looking boy, drowsy, febrile (temperature of 38.6°C), pale and dehydrated. Blood pressure was 90/60 mmHg and pulse 146 b/min small volume. The abdomen was grossly distended with generalized tenderness, guarding, and rebound tenderness. There was a sutured wound on the right iliac fossa, and bowel sound was

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absent. Preliminary investigations revealed essentially normal serum urea and creatinine levels, and a hemoglobin level of 6 g/dl. Abdominal ultrasonography showed grossly dilated and aperistaltic loops of bowels with large volumes of echo-rich ascites. An initial diagnosis of generalized peritonitis with severe sepsis was entertained.

The patient's clinical state was optimized with intravenous fluids and blood transfusion. The patient was later moved to the theater for an emergency exploratory laparotomy. Intraoperative findings include massive hemorrhagic ascetic fluid, extensive left colonic gangrene extending from distal transverse colon to the sigmoid colon, and thrombosis in the branches of the inferior mesenteric vessel [Figure 1]. Resection of gangrenous bowels was done with a transverse colostomy. No intra-abdominal mass was found as suspected by the referring hospital. Initial postoperative period was turbulent, and the patient was managed in the intensive care unit (ICU) but died 36 h after surgery. In the ICU, the patient was on continuous oxygen therapy, intravenous fluids, intravenous meropenem, metronidazole, and dopamine infusion. The oxygen saturation fluctuated between 70% and 86%, and pulse remained above 120 b/min. The resected bowel sent for histopathology confirmed infarction necrosis of the colon.

DISCUSSION

Mesenteric venous thrombosis may be completely asymptomatic, seen as an incidental finding in abdominal ultrasonography or computerized tomography for other reasons, especially in mild subacute and chronic types.^[1-3] The acute type commonly manifests with sudden-onset abdominal pains.^[1,3] The chronic variety may present with features of portal hypertension because of time allowed for collateral circulations to develop.^[1,3,7] The clinical presentation is largely nonspecific.^[2,3,5] In the acute variety, abdominal pain constitutes the major symptom in 91%–100% of cases and could mimic other causes of acute abdomen.^[2] This was the case in the index patient where an initial clinical diagnosis of



Figure 1: Intraoperative picture showing extensive bowel gangrene from the distal transverse colon to the sigmoid colon

acute appendicitis was made with attempted appendectomy which was abandoned. Other nonspecific symptoms may include nausea, vomiting, hematemesis, hematochezia, and melena.^[2,3] Fever, peritoneal signs, hypotension, and ascites are features suggestive of bowel infarction and poor prognosis.^[2] This was the presentation in the index case which later resulted in mortality.

The incidence of MVT has increased over the years largely due to improvement in the use of imaging studies.^[2,7,11-13] Majority of the laboratory investigations are not helpful in making the diagnosis of MVT.^[2,3] Findings in plain abdominal X-ray are nonspecific and are used only to rule out some other causes of acute abdomen.^[2] Doppler ultrasonography could be helpful and can demonstrate thrombus in the mesenteric vein.^[2] Although it is specific, its sensitivity is hampered by bowel gases and by the fact that it is operator dependent.^[2] Abdominal ultrasound done in our index case was not helpful in making the diagnosis. Conventional contrast-enhanced computed tomography (CT)-scan is sensitive in detecting thrombus in the mesenteric veins, but it is limited by respiratory and motion artifacts.^[11] Helical CT-scan, CT angiography, and gadolinium-enhanced magnetic resonance (MR) angiography are currently the primary imaging modality for patients highly suspected of having mesenteric bowel ischemia.^[11] Conventional angiography which is invasive, should be reserved for cases where other imaging modalities such as CT and MR angiography are equivocal or where invasive therapeutic measures are planned.^[2,11]

The etiology of MVT could be primary/idiopathic or secondary to some other identifiable causes.^[2,5,14] The primary/idiopathic causes usually account for 21%–49% of cases and depend on the extent and depth of evaluation.^[1,2,9,14] MVT could result from any or combination of these risk factors: thrombophilia, endothelial injury, and venous stasis (Virchow's triad).^[1,3,5] Thrombophilia could be from inherited or acquired causes. Inherited thrombophilia may include deficiencies of protein C and S, antithrombin III, factor V Leiden deficiency, and sickle cell disease.^[1,3] The acquired thrombophilia may include polycythemia vera, myelofibrosis, thrombocythemia, JAK2 gene sequence variation, antiphospholipid antibodies, paroxysmal nocturnal hemoglobinuria, malignancy, oral contraceptive pills, pregnancy, nephrotic syndrome and hyperhomocysteinemia.^[1,3] Endothelial injury as a risk factor may result from inflammatory conditions such as pancreatitis, inflammatory bowel disease, diverticulitis, peritonitis, and appendicitis. Other possible causes of endothelial injury include abdominal trauma and intra-abdominal surgeries.^[1,3] Venous stasis could result from a congenital venous anomaly, congestive splenomegaly, cirrhosis, congestive heart failure, etc.^[1,3] The definitive etiological or risk factor for the index case could not be ascertained due to the acuteness of the presentation and early mortality.

Management outlook for these patients has improved with the preventive and therapeutic use of anticoagulant therapy.^[5,11,12] However, bowel rest, nasogastric aspiration, analgesics, correction of fluid and electrolyte deficits, blood transfusion, and broad-spectrum antibiotics are useful in acute presentation.^[1-3] Anticoagulation with either unfractionated heparin or low-molecular-weight heparin constitutes the initial management approach.^[1-3] This is usually followed by warfarin therapy for those patients that require prolonged anticoagulation.^[1-3] Interventional radiologic procedures may be considered in patients with risk of bowel infarction but without features of peritonitis.^[1-3] If there is patency in the mesenteric vein, vasodilator therapy with thrombolytics may be useful.^[1,2] However, surgery and bowel resection may occasionally be required for patients with bowel infarction, gangrene, and peritonitis as in the index case.^[1-3,5,11-13]

CONCLUSION

Inferior mesenteric venous thrombosis is a very rare condition with serious management challenges, especially in a resource-poor environment. The acute variety is associated with high morbidity and mortality, especially if there are accompanying bowel infarction and peritonitis. High index of suspicion and use of modern imaging techniques will help in making early diagnosis and reduce fatalities.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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