

Superior mesenteric venous thrombosis after laparoscopic radical resection of rectal cancer: a report of a rare case and literature review*

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Abstract

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Mesenteric venous thrombosis (MVT) is rare, but life-threatening. MVT is often characterized by occult and nonspecific signs and symptoms. Diagnosis requires a high index of clinical suspicion, and emergency surgery is necessary to optimize patient survival, especially in people aged more than 70 years. MVT is a rare but fatal complication after laparoscopic radical surgery for rectal cancer. This study reports a case of extensive intestinal ischemic infarction caused by acute MVT after laparoscopic radical surgery for rectal cancer in a 70-year-old male.

Key words: venous thrombosis, mesentery; radical resection of rectal cancer; intestinal necrosis

Colorectal cancer is the third most commonly diagnosed cancer in men and is second most common in women, representing almost 10% of the annual global cancer incidence [1]. Large comparative studies and multiple prospective randomized controlled trials (RCTs) have reported short-term and long-term equivalence of open surgical and laparoscopic treatment for colon cancer, leading to wide acceptance of laparoscopic colon cancer resection [2]. Laparoscopic resection is safe and reliable for low colorectal cancer, increasing the chance of recovery of anal function [3]. However, serious postoperative complications can occur, such as mesenteric venous thrombosis (MVT). This refers to acute, subacute, or chronic thrombosis of the superior mesenteric vein or branch. It is considered a rare and insidious disease with a high mortality rate, and may present with acute abdominal pain or asymptomatic incidental findings on abdominal imaging. The estimated annual incidence of MVT is 2.7 per 100,000, and is highest in men (12.0

per 100,000) and women (10.8 per 100,000 people) 70–79 years old [4]. We report a case of extensive intestinal ischemic infarction caused by acute MVT in a 70-year-old man after laparoscopic radical resection for rectal cancer (LAR).

Case report

A 70-year-old man with rectal cancer underwent LAR in a local hospital. The patient had a history of transient cerebral ischemia 7 years prior. Successful LAR was performed 15 days prior to transfer. The patient passed flatus on the third day after surgery and defecated on the fourth day. He recovered without incident, and started a Chinese medicine preparation on the fifth postoperative day. He then developed abdominal pain and distension and decreased flatus, and had no bowel movement for 10 days. One day prior to transfer, the abdominal pain

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and distension worsened. He was transferred to the emergency department of the Affiliated Hospital of Qingdao University. Physical examination revealed diffuse abdominal tenderness. His height and weight were 175 cm and 80 kg, respectively, (body mass index: 26.4 kg/m²). He had no history of diabetes mellitus, hypertension, or a coagulopathy, and was a nonsmoker. The white blood cell count was 23,940/mm³, and the C-reactive protein level was 7 mg/dL (normal range 0–5). Contrast-enhanced abdominal computed tomography showed a thrombus extending from the superior mesenteric vein to the hepatic portal vein (Fig. 1). MVT with portal vein thrombosis and intestinal obstruction were diagnosed based on the presenting symptoms, signs, and physical and imaging examinations. Preliminary treatment was as follows: (1) Heparin administration by intravenous infusion, with monitoring of blood indicators, and activated partial thromboplastin time maintained at 1.5–2.5 times; (2) Implantation of an indwelling gastric tube for decompression, with drainage of about 200 ml of dark green liquid; (3) Administration of imipenem + vancomycin; (4) Rehydration, with maintenance of water and electrolyte homeostasis.

On the third day after transfer, abdominal distension and pain worsened. Physical examination revealed abdominal distension, with mild rebound tenderness but no rigidity. Murphy's sign was negative. Tympanic sounds were localized to the mid-abdomen and were thought to be caused by intestinal obstruction. The indwelling gastric tube maintained decompression, and had drained 750 mL of dark green stomach content. With abdominal pain caused by intestinal obstruction, the possibility of progression to ischemic intestinal necrosis could not be ruled out. After consultation with the patient and his family, emergency laparotomy was performed. A 70 cm segment of ischemic small bowel that began at 30 cm from the ligament of Treitz was resected (Fig. 2–3). Partial small intestine resection + jejunal feeding tube implantation were performed, and a double cannula was placed above the anastomosis. The postoperative vital signs were stable (Fig. 4). He was discharged on the 7th postoperative day on oral anticoagulation (warfarin 5 mg/day) for 6 months.

Discussion

The estimated annual incidence of MVT is 2.7 per 100,000, and is highest in men (12.0 per 100,000) and women (10.8 per 100,000 people) 70–79 years old^[4]. Low awareness among clinicians may be responsible for the mortality rate of 20% in recent series. Because the onset of disease may be insidious and follows a benign course, computed tomography is the first choice for primary screening of MVT. Timely diagnosis could enable effective

anticoagulation therapy^[5–6]. Diagnosis of mesenteric ischemia caused by venous disease requires investigation for risk factors, based on clinical assessment, laboratory testing, and imaging. However, there are some nonspecific



Fig. 1 Abdominal tomography. The red arrow shows the portomesenteric thrombosis



Fig. 2 Intraoperative view: about 1,200 mL of serosanguinous ascites fluid



Fig. 3 Image of the ischemic bowel segment

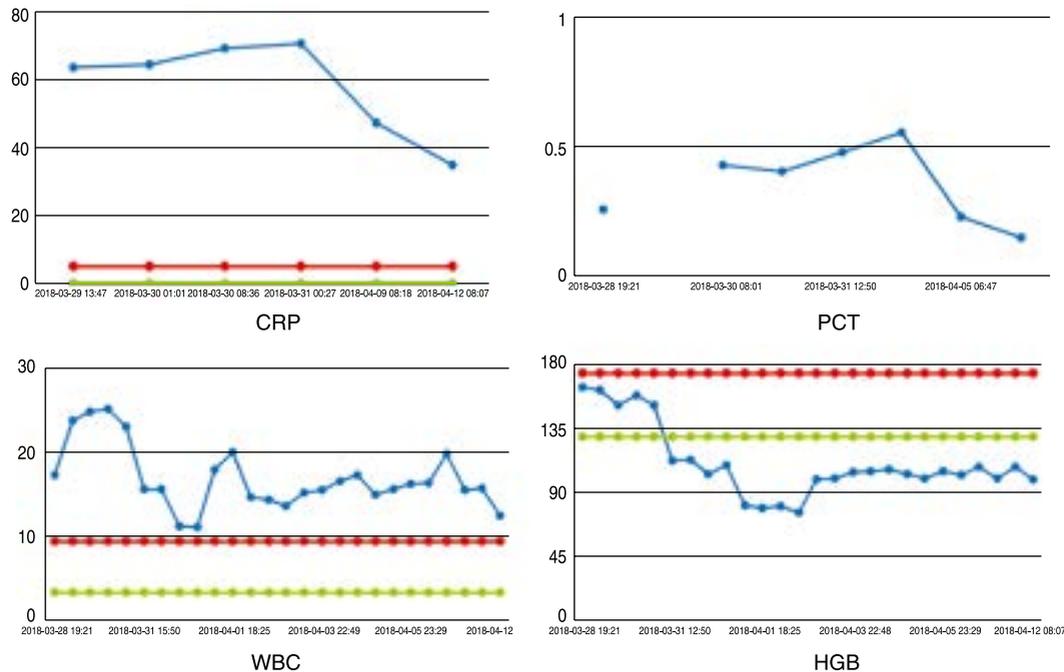


Fig. 4 Postoperative laboratory results

plasma biomarkers of MVT. An elevated D-dimer level may be sensitive but nonspecific [7]. Watershed areas of splanchnic circulation are more vulnerable to ischemia. MVT involves the superior mesenteric vein in 95% of cases and is usually caused by systemic coagulation disorders [8]. MVT may be idiopathic, but is more often secondary to predisposing hypercoagulable states, such as bowel obstruction, inflammation, trauma, major cardiovascular surgery, portal hypertension, and malignancy. MVT secondary to disseminated cancer usually occurs with, but is not limited to, pancreatic adenocarcinoma and hepatocellular carcinoma [9–10]. Thrombi usually originate in the venous arcades and propagate to involve the arcuate channels. Thrombosis of small veins draining close to the bowel is more likely to cause bowel infarction as well. Hemorrhagic infarctions occur when the intramural vessels are occluded. With MVT, bowel ischemia may be acute, subacute, or chronic, and the clinical presentation varies from relatively asymptomatic to acutely ill [11]. The incidence of chronic MVT may be underestimated. MVT is often the result of multiple factors including a hypercoagulable state, endothelial damage, and blood stasis. Hypercoagulable states are divided into hereditary and non-hereditary types. MVT may be due to intestinal inflammation, abdominal infection, or abdominal trauma, and abdominal surgery can lead to endothelial damage and inflammation. Portomesenteric venous thrombosis following laparoscopic surgery usually manifests as nonspecific abdominal pain. Computed tomography can readily provide the diagnosis and demonstrate the extent

of the disease. Treatment should be individualized based on the extent of thrombosis and the presence of bowel ischemia but should include anticoagulation therapy. Venous stasis from increased intra-abdominal pressure, intraoperative manipulation of splanchnic vasculature, and systemic thrombophilic states likely converge to produce this potentially lethal condition [12].

This case report suggests that despite advances in minimally invasive techniques, the artificial pneumoperitoneum used in laparoscopic surgery can lead to a sharp increase in abdominal pressure, extensive visceral vasoconstriction, slow flow in mesangial veins, and even stasis, while intraoperative manipulation can lead to visceral vascular endothelial damage and systemic thrombosis. Both can promote the formation of venous thrombosis. Therefore, patients with a previous history of surgery (such as laparoscopic surgery, splenectomy) and risk factors of hepatitis, cirrhosis, venous thrombosis, long-term oral contraceptive use, and malignant tumors should be considered at risk of MVT.

Conflicts of interest

The authors indicated no potential conflicts of interest.

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