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Case Report

Superior Mesenteric Venous Thrombosis Following Laparoscopic Right Hemicolectomy

Tomotaka KUMAMOTO[1], Naotake FUNAMIZU[1], Tomoyoshi OKAMOTO[1], and Katsuhiko YANAGA[2]

[1]*Department of Surgery, The Jikei Daisan Hospital*
[2]*Department of Surgery, The Jikei University School of Medicine*

ABSTRACT

Superior mesenteric venous thrombosis (SMVT) rarely occurs after laparoscopic colectomy but is a potentially life-threatening postoperative complication. A 78-year-old woman underwent laparoscopic right hemicolectomy for cancer of the ascending colon. On postoperative day (POD) 11, the patient complained of abdominal pain. Because the pain worsened the following day, computed tomography was performed and demonstrated a thrombus in the SMV without ischemic change of the intestine or ascites. Therefore, conservative management was started with intravenous heparin infusion for 7 days and with warfarin added on POD 17. Shrinkage of the thrombus was confirmed with computed tomography on POD 21, and the patient was discharged on POD 26. Cases of SMVT require early detection and prompt treatment to reduce morbidity and mortality. Therefore, SMVT should be included in the differential diagnosis of abdominal pain following laparoscopic surgery.

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Key words : superior mesenteric venous thrombosis, laparoscopic surgery, anticoagulation therapy

INTRODUCTION

Superior mesenteric venous thrombosis (SMVT) is an uncommon but potentially life-threatening condition, accounting for 5% to 15% of all mesenteric ischemic events[1]. Most SMVTs are related to abdominal surgery, portal hypertension, abdominal trauma, and coagulopathies[1]. Initial symptoms, such as abdominal pain, vomiting, and melena, are nonspecific and can delay the diagnosis of SMVT. We herein report on a patient with SMVT following laparoscopic right hemicolectomy for colon cancer who was successfully treated with anticoagulation therapy alone.

CASE PRESENTATION

A 78-year-old woman with chronic hepatitis C infection visited her primary care physician for an annual checkup. Because a test for fecal occult blood was positive, the patient was referred to our hospital to undergo colonoscopy. This examination showed a protruding mass with central ulceration, 20 mm in diameter, in the ascending colon near the hepatic flexure. An endoscopic biopsy established the diagnosis of adenocarcinoma, and preoperative contrast-enhanced computed tomography (CT) showed no metastasis to the lungs, liver, or lymph nodes (cT2N0M0, cStage I : Union for International Cancer Control classification). Serum analysis showed normal levels of carcinoembryonic antigen (3.1 ng/mL) and carbohydrate antigen 19-9 (29 U/mL).

A laparoscopic right hemicolectomy with D3 lymph node dissection was performed. The postoperative course was uneventful until postoperative day (POD) 11, when the

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隈本　智卓，船水　尚武，岡本　友好，矢永　勝彦
Mailing address : Tomotaka KUMAMOTO, Department of Surgery, The Jikei Daisan Hospital, 4-11-1 Izumi-honcho, Komae, Tokyo 201-8601, Japan.
E-mail : kumamoto@jikei.ac.jp

patient complained of nausea, vomiting, and pain of the right lower quadrant of the abdomen. Physical examination revealed the following : body temperature, 36.4°C ; blood pressure, 95/75 mm Hg ; pulse rate, 72 beats/minute ; respiratory rate, 20 breaths/minute ; and a soft, nondistended, tender abdomen. Laboratory data were as follows : white blood cell count, 8,200/μL ; D-dimer concentration, 5.1 μg/mL ; prothrombin time, 76 seconds ; activated partial thromboplastin time, 28.8 seconds ; antithrombin III, 80% ; and platelet count, $367 \times 10^3/\mu L$. Otherwise, no findings were remarkable. An x-ray examination of the abdomen revealed diffuse distention of the small bowel and suggested small-bowel obstruction, for which the patient was given nothing by mouth. On POD 12, the abdominal pain had worsened, and, therefore, a CT examination with contrast enhancement of the abdomen was performed. This examination showed a filling defect in the SMV during the portal venous phase (Fig. 1) which suggested a thrombus and edematous thickening of the intestinal wall but no ischemia or ascites.

On the basis of these findings, SMVT without peritoneal signs was diagnosed. Conservative treatment was started on POD 12 with 12,000 U of heparin per day for 7 days and the addition of oral warfarin (1.5 mg/day) on POD 17 to achieve a target international normalized ratio of 2 to 3. However, the targeted value was not achieved because of the poor adherence of the patient. On POD 21, the patient again underwent a contrast-enhanced CT examination of the abdomen which showed a resolving thrombus (Fig. 2a, arrow) without intestinal ischemia. The patient was discharged on POD 26.

On POD 56, a follow-up CT examination of the abdomen showed complete disappearance of the thrombus (Fig. 2b, arrow). Oral warfarin was discontinued on POD 61 at the request of the patient (Fig. 3). No tumor or thrombus recurrence has been observed during the following 2 years in the absence of an anticoagulant.

DISCUSSION

Of cases of acute superior mesenteric occlusion, 82% are caused by superior mesenteric arterial thrombosis but only 18% by venous thromboses[1]. Among patients with MVT, the mean age of presentation is 45 to 60 years and men are slightly more common than women[2]. Symptoms of SMVT are nonspecific and include abdominal pain, nausea, vomiting, anorexia, diarrhea, melena, and flu-like symptoms. Risk factors for SMVT include abdominal surgery, inherited or acquired coagulopathies, malignant tumors, intraperitoneal inflammation, liver cirrhosis, portal hypertension, and long-term administration of oral contraceptives[1]. On the other hand, up to 37% of SMVTs are idiopathic[2]. The frequency of SMVT after laparoscopic surgery for acute abdomen is 0.1%[3].

In the present patient, anticoagulation factors were within their normal ranges, and antiphospholipid antibodies were not detected. No other laboratory or intraoperative findings indicated liver cirrhosis. Therefore, the most likely mechanisms for SMVT in this patient were lymph node dissection and pneumoperitoneum resulting in decreased blood flow and endothelial injury. Mesenteric thrombosis has been hypothesized to be caused if sufficient vascular

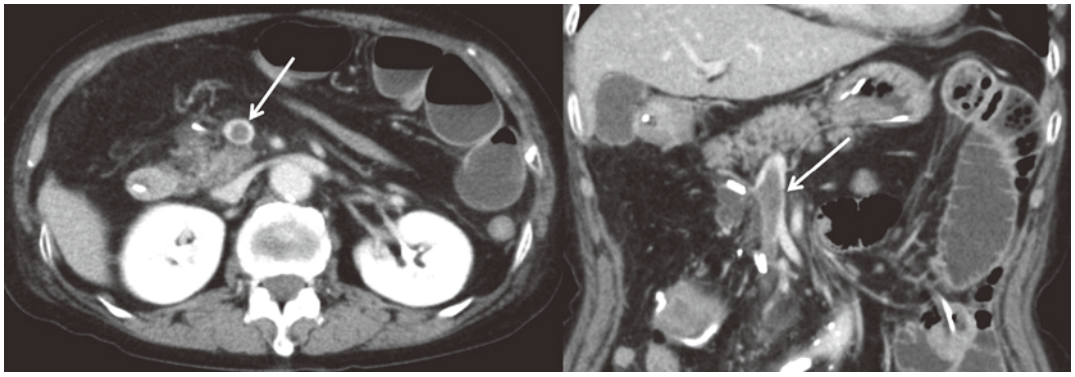

Fig. 1. Computed tomographic images on postoperative day 12. Contrast-enhanced computed tomography showed a filling defect in the superior mesenteric vein (arrow) which ranged from bifurcation of the ileocolic vein to the confluence of the splenic and superior mesenteric vein. The maximum diameter was 11 mm. No distinct thrombus was observed in the portal vein.

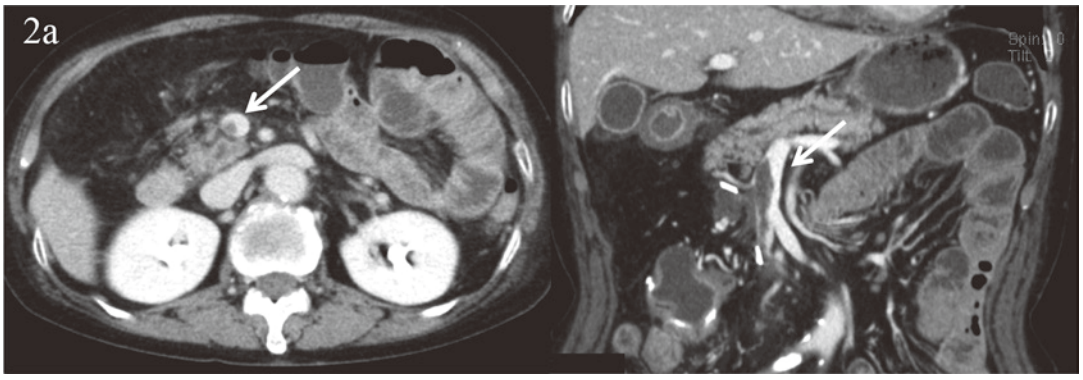

Fig. 2a. Contrast-enhanced computed tomographic images of the abdomen from postoperative day 21 showed shrinkage of the thrombus (arrows).

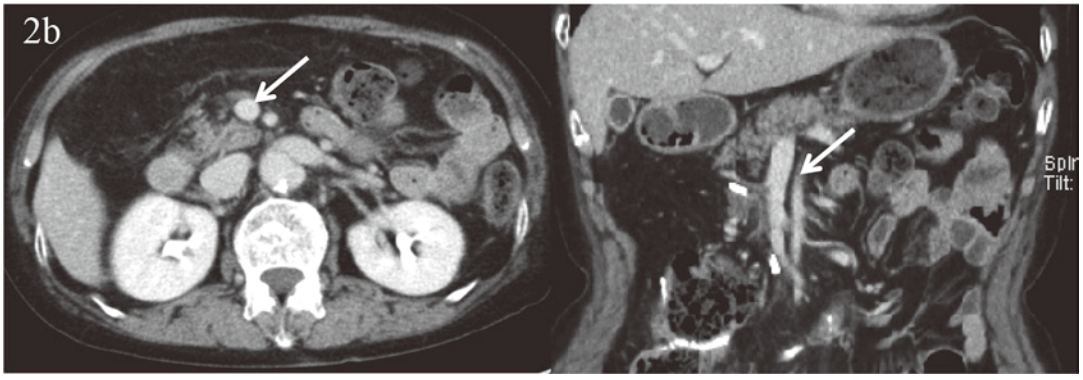

Fig. 2b. Contrast-enhanced computed tomographic images of the abdomen from postoperative day 56 showed complete disappearance of the thrombus (arrows).

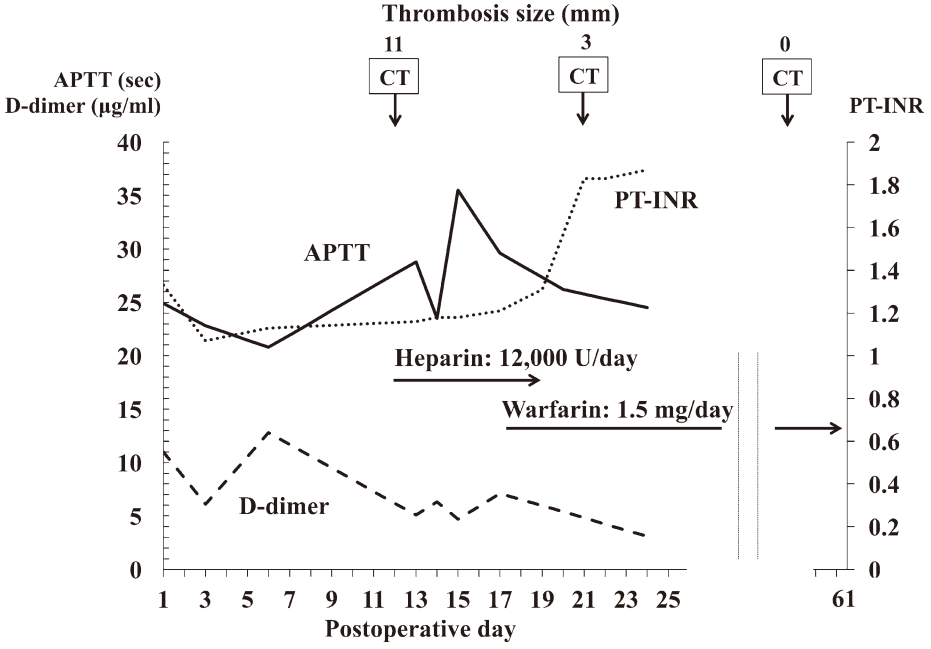

Fig. 3. Treatment course after surgery.
Abbreviations : computed tomography, CT ; activated partial thromboplastin time, APTT ; and prothrombin time-international normalized ratio PT-INR.

trauma is produced when the colon and its mesentery are mechanically compressed after being brought externally through a small incision to complete extracorporeal anastomosis[4]. Due to the presence of nonspecific signs and symptoms, SMVT is often difficult to diagnose without appropriate imaging examinations. Contrast-enhanced CT of the abdomen is an effective examination for diagnosing SMVT[4]. Likewise, color Doppler ultrasonography of the abdomen is also an effective diagnostic examination but is still inferior to CT, especially in patients with abundant intestinal gas[5,6].

Several treatment options are available for SMVT, including conservative therapy, such as anticoagulation and interventional radiology, and surgical therapy, such as intestinal tract resection and thrombectomy. When intestinal necrosis has not been observed, the initial treatment should be supportive care by means of systematic anticoagulation with heparin. To the best of our knowledge, 4 cases of SMVT have been reported after laparoscopic surgery of the colon, which has included colectomy and total mesorectal excision[4,7-9]. Three of the 4 patients recovered through conservative treatment with an anticoagulant alone, and the other patient was treated with thrombectomy ; all 4 patients survived. In the present case, the patient was clinically stable without intestinal necrosis and received a warranted conservative treatment with anticoagulation. In the United States and Europe, the mortality rate of SMVT is 10% to 20%[2]. After an initial therapy, patients should continue to receive warfarin to prevent recurrence[10].

The development of SMVT is a rare postoperative complication of laparoscopic surgery. Although patients often have pain after laparoscopic surgery, SMVT must be considered as a possible complication.

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