Case Report

A Novel Surgical Method for the Postoperative Treatment of Superior Mesenteric Vein Thrombosis: Report of a Case

Kentaro NAKAO, Akira TSUNODA, Thoru OONAKA,
Yoshihiko IZUMIDA, Kimiyasu YAMAZAKI, Takashi NIIYA,
Hirohisa KATO, Tsutomu KAETSU and Mitsuo KUSANO

Abstract : We report a case of Superior Mesenteric Vein Thrombosis (SMVT) surgically treated by resection of the small intestine, and the development of an effective novel method for therapy of small intestinal stoma and nutrition after the operation. SMVT with thrombosis length of about 3 cm was diagnosed with computed tomography (CT) in a 59-year-old male experiencing acute abdominal pain. Initially, IVR for thrombolytic therapy was unsuccessfully conducted. Thus, we subsequently performed resection of small intestine displaying necrosis due to disorder of blood flow, which was 20 cm in length and located 20 cm distal to the Trize band, but did not anastomose in primary to avoid anastomotic leakage by re-thrombosis. We performed temporary gastrostomy for the drainage of intestinal juice, and jejunostomy with the stomas of the closed small intestinal ends to detect blood flow disorder. A nutritional tube was inserted into the anal stoma. This method is generally successful for collecting all the intestinal juice that damages skin, and providing high-calorie nutrition. Further, more this prevented dermatitis due to intestinal juice around the intestinal stoma. After ensuring no recurrence of re-thrombosis, the intestinal stoma was closed. A present, this patient is monitored as an outpatient. We propose that this operative method is applicable for the administration of stomas and surrounding skin in other diseases.

Key words : Superior Mesenteric Vein Thrombosis, operative method, Intestinal Stoma, enterostomy, enteral nutrition

Introduction

Superior Mesenteric Vein Thrombosis (SMVT) or Portal Vein Thrombosis is a rare disease that is difficult to diagnose in the early stages. Effective therapy is currently a major problem due to the unknown origin and slow progression. In general, this disease requires surgical treatment via the resection of intestines. The patient in this study was difficult to treat due to leakage of anastomosis resulting from re-thrombosis, as reported in some literature¹⁻³⁾. Here, we report a case of SMVT which was successfully treated using a novel procedure.

Case Report

A previously healthy 59-year-old man was referred to our hospital following abdominal pain on November 8, 2002. A physical examination revealed abdominal distension, weak rebound tenderness, and muscular defense. The white blood cell count was elevated to $9900/\text{mm}^3$, GOT was 50 IU/l, and CRP was 20.3 mg/dl. PT and APTT were within normal levels at 98% and 32.3 sec, respectively. Extensive laboratory testing for primary hypercoagulable state was performed on admission. Protein C and S levels were within the normal range (73% and 112%, respectively). Postoperatively, the AT-III level was low at 39.0% (under heparin infusion). Early stage of superior mesenteric vein thrombosis with a length of about 3 cm was disclosed by means of abdominal computed tomography (CT) (Fig. 1a). IVR (interventional radiology) was initially performed for thrombolysis therapy, due to the decreased range of resected small intestine (Fig. 1b). However this therapy was ineffective, since it was too difficult to make a portal vein incision. Thus, thrombolysis therapy was not possible. Meanwhile, the abdominal pain and rebound tenderness symptoms were aggravated. Therefore, the treatment course was altered to a surgical procedure, and the patient underwent resection of the necrotic small intestine.

Operative findings disclosed congestive necrosis of the jejunum with a thick and

Fig. 1

- a: An enhanced CT scan discloses superior mesenteric vein thrombosis (∇) and markedly thickened small bowel ($\nabla\nabla$). (Nov. 8, 2002)
- b: Portal vein observed by percutaneous transhepatic portography (PTP). A catheter was inserted into the right branch of the portal vein, and SMV disappeared for thrombosis ($\blacktriangledown$). The collateral vein was developed. (Nov. 8, 2002)
- c: Superior mesenteric vein thrombosis disappeared in the CT scan. (Nov. 28, 2002)

Fig. 2

a: Postoperative findings of the abdomen

- (A) Temporal gastrostomy performed for decompression of oral side closed stoma and intestinal juice collection. The tip of the gastrostomy tube led to the second portion of the duodenum.
- (B) Oral side closed stoma to monitor the color and disorder of blood flow.
- (C) The jejunostomy tube inserted into the anal side stoma for either nutrition or re-administration of gastro-intestinal juice drained by gastrostomy.

b: Operative findings

Before: Necrosis of the jejunum with thick and edematous wall, 20 cm in length and located 20 cm distal to the Trize band. This part of the intestine was resected.

After: We performed (A) Temporal gastrostomy, and generated (B) Oral side closed stoma, (C) anal side stoma and a jejunostomy tube.

edematous wall, which was 20 cm in length and located 20 cm distal to the Trize band. This segment was resected, and each stoma was closed to avoid possible anastomotic leakage due to re-thrombosis. The viability of the small intestine was monitored according to stoma color. Temporal gastrostomy was performed for decompression of the oral side closed stoma, and the jejunostomy tube was inserted into the anal side stoma for either nutrition or re-administration of gastro-intestinal juice drained by gastrostomy (Fig. 2).

Nutritional support (1200 Cal/day) and re-administration of juice commenced on postoperative day six. Follow-up CT examinations on November 19 and 28, 2002, disclosed patent SMV with residual nonocclusive thrombosis. Both sides of closed stomas were anastomosed on postoperative day 32 (Dec. 10). Following intact anastomosis with gastrographin administered by gastrostomy on second postoperative day four (Dec. 14), an oral diet was started.

Heparin (10000 units/day) infusion was initiated on postoperative day three for anticoagulation therapy. After the second operation, warfarin (5 mg/day) and bufferin (81 mg/day) were administered. Heparin treatment was stopped when a therapeutic level was achieved. The patient was discharged on 11th January. A follow-up examination three months later revealed that the patient was doing well and eating a regular diet.

Macroscopically, an outflow vein of the resected bowel was filled with thrombosis. Microscopically, thrombosis was identified in the mesenteric border. A necrotic inflammatory substance covered the mucous membrane, and fibrin appeared on the serosa. The submucous layer of the bowel was edematous.

Discussion

It is generally difficult to diagnose SMVT due to acute or subacute presentation. Recently, this disease has been diagnosed with a number of techniques, such as CT, due to the progress in radiological examination methods^{4,5)}. SMVT is frequently associated with basic diseases, including abdominal infection or inflammation, trauma or surgery, and hypercoagulable states, such as deficiencies of antithrombin III, protein C or protein S^{6,7)}. Postoperative laboratory examinations disclose coagulation disorders of lower levels of antithrombin III. The case investigated in this study was not based on antithrombin III deficiency. The short length of intestinal necrosis in our patient was attributed to a developed collateral vein and short length of thrombosis.

Thrombolytic therapy should be considered initially, especially in the early stages⁸⁾. Accordingly, our patient was subjected to this therapy. However, this mode of treatment failed, since portal vein incision was very difficult. Surgical treatment is generally advisable when rebound tenderness is recognized. Although we identified weak rebound tenderness, IVR was preferentially selected, since intestinal ischemia is improved by thrombolytic therapy.

The use of primary anastomosis following bowel resection is controversial. Some reports demonstrate 22%–31% re-thrombosis after the first anastomosis^{1–3)}. In our patient, the intestine ends were sutured into the abdominal wall to ensure viability of the ends and determine the timing of re-operation. Shaw and Rutledge recommended a second-look operation after 24–48 h of resection in view of the possibility of intestinal necrosis development in SMVT⁹⁾. Possible leakage following primary anastomosis may be avoided with this method. With respect to the rate of recurrence, resection with thrombolytic therapy led to a better prognosis than thrombolytic therapy alone¹⁾. In our case, heparin infusion (hepanalisation) was administered in the duration between the two operations to prevent recurrence. Closure of the ends of the resected intestine protected the skin around the stoma from digestive juices, and thus made postoperative skin care easier. In our case, temporal gastrostomy was performed. This allowed us to collect intestinal juice, which was re-administered into the anal stoma. The procedure appears useful for the prevention of

fluid and electrolyte deficit. Our method provides improved nutrition therapy and effective prevention of re-thrombosis and invasion of skin by intestinal juice, compared with other surgical methods, such as first anastomosis and the second-look operation.

For the effective treatment of SMVT, selection of medical treatment, determination of the surgical operation method to employ, including resection or anastomosis of intestine, postoperative nutritional care, and thrombolytic therapy are important. We propose that the method described in this report is applicable to other conditions or diseases that require small intestinal stoma in the long term.

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[Received March 1, 2004 : Accepted April 6, 2004]