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# A case of ascending colon cancer accompanied with tumor thrombosis in the superior mesenteric vein treated with right hemicolectomy and greater saphenous vein grafting

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## ABSTRACT

**INTRODUCTION:** The occurrence of colorectal cancer with tumor thrombosis in the mesenteric vein is very rare. Here, we report a case of ascending colon cancer with tumor thrombosis in the superior mesenteric vein (SMV) that was treated by complete resection.

**PRESENTATION OF CASE:** A 48-year-old woman was initially admitted due to anemia. Ascending colon cancer coinciding with tumor thrombosis in the SMV was detected. Right hemicolectomy, tumor thrombectomy, and greater saphenous vein grafting of the SMV were performed. She underwent neoadjuvant chemotherapy with capecitabine plus oxaliplatin and did not have any recurrence.

**DISCUSSION:** Due to the high incidence of liver metastasis, the presence of venous tumor thrombosis may influence the patient's length of survival.

**CONCLUSION:** Complete resection of the primary cancer with tumor thrombosis and systemic chemotherapy should be considered for better prognosis.

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## 1. Introduction

Colorectal cancer accompanied with tumor thrombosis in the superior/inferior mesenteric vein (SMV/IMV) is quite rare [1]. Otani et al. in their review article showed that venous tumor thrombosis may be a strong risk factor for the development of liver metastasis [2]; hence, the presence of venous tumor thrombosis may influence the patient's survival. Surgical thrombectomy and complete resection of the primary cancer should be considered for a better prognosis [1,3]. We present a case of tumor thrombosis in the SMV

**Abbreviations:** SMV, superior mesenteric vein; IMV, inferior mesenteric vein; CT, computed tomography; CEA, carcinoembryonic antigen; CA 19-9, cancer antigen 19-9; PET, positron emission tomography; FDG, fluorodeoxyglucose; SUV, standardized uptake value; ICV, ileocolic vein.

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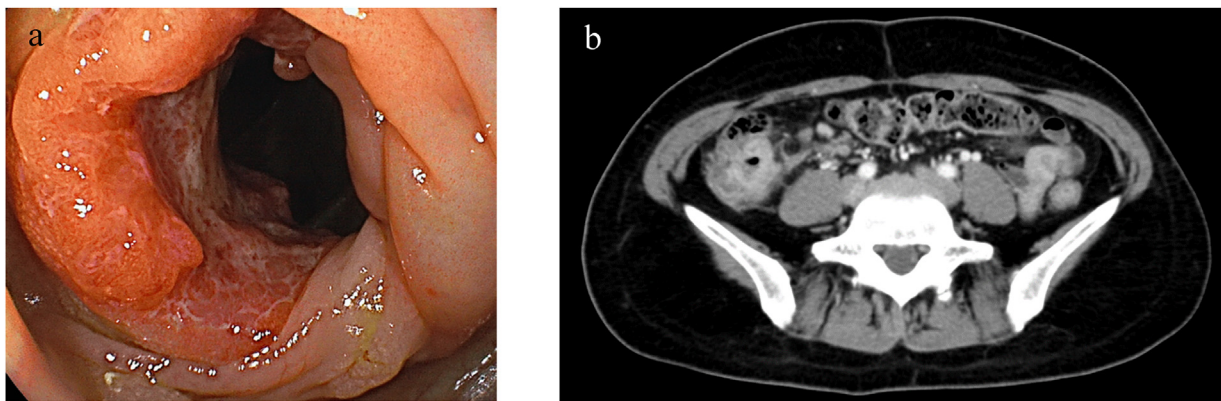
that was treated with right hemicolectomy and greater saphenous vein grafting. To the best of our knowledge, this is the first case report of venous tumor thrombosis due to colorectal cancer that was treated by vein grafting. This work has been reported in line with the SCARE criteria [4].

## 2. Presentation of case

A 48-year-old woman was initially admitted to a nearby hospital due to anemia. Total colonoscopy and computed tomography (CT) revealed ascending colon cancer accompanied with tumor thrombosis in the SMV. Subsequently, the patient was referred to our department for surgical treatment.

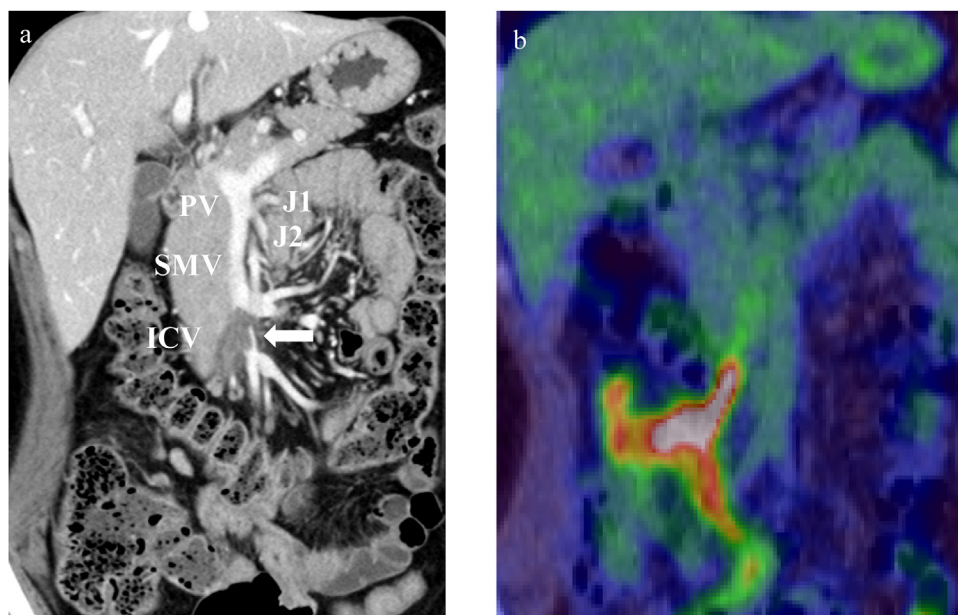
Her medical history was unremarkable. Complete blood count showed white blood cell count and hemoglobin level of 7850/ $\mu$ l and 12.1 g/dL, respectively. Serum biochemistry test results were as follows: aspartate aminotransferase, 17 U/L; alanine aminotransferase, 19 U/L; total bilirubin, 0.1 mg/dL; carcinoembryonic antigen, 341.9 ng/mL; cancer antigen 19-9, 3 U/mL; and C-reactive protein, 0.18 mg/dL. The coagulation marker D-dimer level was 0.7  $\mu$ g/mL.

Total colonoscopy revealed a type 2 tumor in the ascending colon, and moderately differentiated adenocarcinoma was diagnosed by examining the biopsy specimen (Fig. 1a). Computed tomography (CT) showed an enhanced mass in the ascending colon



**Fig. 1.** Images of the colon tumor.

(a) Total colonoscopy reveals a type 2 tumor in the ascending colon. (b) Computed tomography (CT) shows an enhanced mass in the ascending colon without distant metastasis.



**Fig. 2.** Images of the tumor thrombosis.

(a) Contrast-enhanced CT shows an intraluminal filling defect from the ileocolic vein to the superior mesenteric vein (SMV; white arrow). (b) On PET-CT, abnormal FDG uptake extended from the ileocolic vein (ICV) to the SMV (SUV-max: 9.4).

and an intraluminal filling defect from the ileocolic vein to the SMV (Figs. 1b and 2a). On positron emission tomography-computed tomography (PET-CT), abnormal fluorodeoxyglucose (FDG) uptake was observed in the ascending colon (SUV-max: 23.1). Abnormal FDG uptake extended from the ileocolic vein to the SMV (SUV-max: 9.4) (Fig. 2b).

The patient was diagnosed with ascending colon cancer with tumor thrombosis in the SMV. The preoperative staging was T4aN1M0, stage IIIB (TNM classification). After admission, preoperative pharmacological prophylaxis was initiated with unfractionated heparin (15,000 unit/day) to prevent extension of thrombosis. Surgical resection was performed on the sixth inpatient day. Tumor thrombosis extended from the ileocolic vein to the root of the SMV. Right hemicolectomy with D3 lymphadenectomy, tumor thrombectomy of the SMV, and greater saphenous vein grafting were performed (Fig. 3). The duration of surgery was 334 min, and the blood loss was 210 mL.

Pathological examination showed that the tumor was a moderately differentiated adenocarcinoma of the ascending colon, which reached the subserosal layer, with no lymph node metastasis (0/35)

or lymphatic duct involvement (ly0) but with venous involvement (v2) (Fig. 4). The pathological staging was T3N0M0, stage IIA (TNM classification). Contrast-enhanced CT was performed to confirm patency of the reconstructed vein on the seventh postoperative day. Remnant tumor thrombosis or vein stricture was not detected in the CT image (Fig. 5a). The postoperative course was uneventful, and the patient was discharged on the eighth postoperative day. Eight courses of chemotherapy with capecitabine plus oxaliplatin were initiated 6 weeks postoperatively and continued for 6 months. Currently, 17 months have passed after the surgery, and no recurrence has been detected to date (Fig. 5b).

### 3. Discussion

Intraluminal tumor thrombus in the mesenteric vein originating from colorectal cancer is a rare condition [1]. Sato et al. reported that the incidence of advanced colorectal carcinoma with venous tumor thrombosis was 1.7% [5]. In contrast, tumor thrombosis in the portal vein system is a frequent complication of hepatocellular carcinoma because of its hypervascularization [1]. Otani et al.

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