

Case Report

Synchronous Abdominal Aortic Aneurysm and Sigmoid Colon Cancer Treated with Endovascular Aneurysm Repair and Laparoscopic Sigmoidectomy

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SUMMARY

The prevalence of concomitant abdominal aortic aneurysm (AAA) and colorectal cancer (CRC) is increasing. Management of patients with AAA and CRC is controversial, particularly when both diseases require urgent surgical treatment. In this report, a 66-year-old man with a large AAA and concomitant advanced sigmoid colon cancer is described. The patient underwent synchronous endovascular aneurysm repair (EVAR) for AAA and laparoscopic sigmoidectomy for sigmoid colon cancer. The patient was discharged on postoperative day 13 without complications. We conclude that one-stage management with minimally invasive synchronous EVAR and laparoscopic sigmoidectomy may provide an alternative treatment method for patients with large AAA and advanced colon cancer.

Keywords : Endovascular aneurysm repair, Laparoscopic sigmoidectomy, Synchronous

INTRODUCTION

Abdominal aortic aneurysm (AAA) and colorectal cancer (CRC) are frequently encountered in daily clinical consultations, and these conditions often require surgery. With aging of the general population, the prevalence of AAA and CRC is increasing¹⁾. Generally, the indication for surgery in men is an AAA of ≥ 55 mm in size, and in women, AAA of ≥ 50 mm in size²⁾. However, optimal management of patients with

AAA and concomitant CRC is controversial. There is no consensus on the treatment of such patients, and it is unclear whether one-stage or two-stage surgery should be performed. Surgeons should decide the treatment strategy by considering both medical conditions. In the present report, we describe a case of synchronous AAA and sigmoid colon cancer with several other comorbidities. Successful treatment with endovascular aneurysm repair (EVAR) and laparoscopic sigmoidectomy was achieved.

CASE REPORT

A 66-year-old man affected by diabetes, arterial hypertension, and post coronary artery bypass grafting for unstable angina was referred to our hospital with a diagnosis of infrarenal AAA, which was detect-

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Fig. 1 3D-Contrast-enhanced computed tomography showing a large fusiform infrarenal abdominal aortic aneurysm.

ed during a routine medical examination (Fig. 1). The maximum AAA diameter was 60 mm ; thus, the patient was a candidate for surgical treatment. During the preoperative examination, colon cancer was detected in the sigmoid colon (Fig. 2). The clinical depth of the cancer was T4a, and multiple instances of lymph node metastasis without distant metastasis were detected by computed tomography. The hemoglobin of 10 g/dl, and the concentration of carcinoembryonic antigen (CEA) was high (8.3 $\mu\text{g/L}$). Furthermore, coronary angiography revealed moderate left anterior descending coronary artery stenosis. Colonoscopy demonstrated a hemorrhagic and circumference type-II tumor in the sigmoid colon (Fig. 3), and the biopsy revealed moderately differentiated tubular adenocarcinoma. We diagnosed the patient with large AAA and concomitant advanced sigmoid colon cancer. Considering the past medical history of the patient and the advanced stage of both diseases, we planned simultaneous surgery using minimally invasive EVAR and laparoscopic sigmoidectomy.

Initially, EVAR for AAA was performed using an endoprosthesis (Endurant II). Stent grafts were deployed successfully and no endoleak was observed (Fig. 4). After reversal of heparin anticoagulation by protamine administration, laparoscopic sigmoidectomy was performed (Fig. 5). The abdominal cavity was



Fig. 2 Contrast-enhanced computed tomography showing a sigmoid colon cancer.

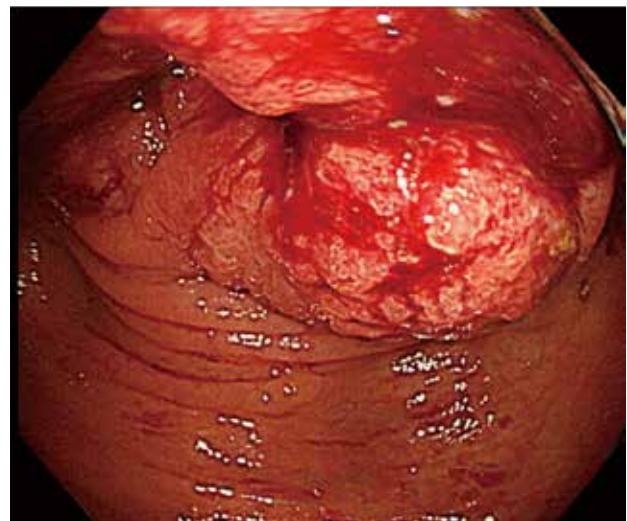


Fig. 3 Colonoscopy showing a circumference type II tumor in the sigmoid colon.

inspected laparoscopically, revealing that the pulsatile AAA had disappeared. There was no evidence of ischemic colitis. High ligation of the inferior mesenteric artery was performed by double clipping to dissect the lymph node (D3). Because of obstructive colitis, sigmoidectomy with the stump of the proximal colon was performed to avoid anastomotic leakage. Intraoperative indocyanine green fluorography was performed after marginal artery ligation, which showed that the stump was perfused by plenty of blood vessels.

The total duration of the combined surgery was 423 minutes, and no blood transfusion was required. The postoperative course was uneventful, and the

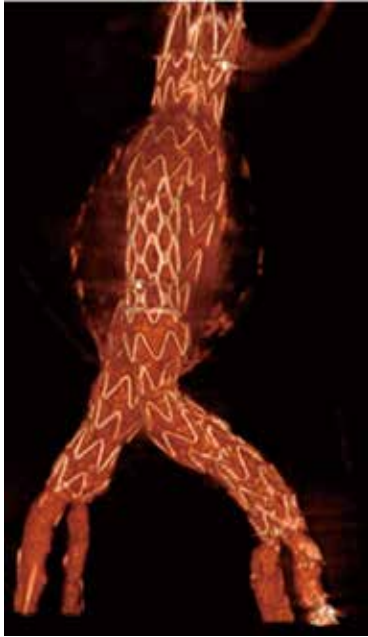


Fig. 4 3D-computed tomography showing endovascular aneurysm repair for abdominal aortic aneurysm.

patient was discharged on postoperative day 13. The final tumor-node-metastasis classification was pT4aN2M0 stage III.

DISCUSSION

The reported incidences of synchronous malignancy in patients with AAA range from 3% to 13%³⁾, and the incidences of synchronous colorectal cancer in patient with AAA range from 0.5% to 1.7%^{4,5)}. Optimal management of patients with AAA and concurrent malignancy is controversial, particularly when both diseases require urgent surgical treatment. The main controversy relates to the timing of the two interventions and whether they should be performed as a one- or two-stage procedure. In the case of two-stage procedures, treatment of AAA prior to treatment of malignancy exposes the patient to a risk of malignancy progression, whereas treatment of the malignancy first exposes the patient to a risk of AAA rupture in the perioperative or postoperative period^{6,7)}. These risks may be avoided using the one-stage approach.

However, the risk of surgery may be increased due to the longer surgical duration, bleeding due to use of anticoagulants, ischemic colitis, or anastomotic leakage.



Fig. 5 The formalin-fixed resected colon carcinoma.

EVAR for AAA was first reported in 1991⁸⁾. EVAR is associated with significantly lower operative mortality compared with open surgery^{9,10)}. The advantage of EVAR is that it is minimally invasive compared with open surgery. Because it does not go directly through the abdominal cavity, there is no concern about adhesions during surgery for CRC, and unlike open surgery, the retroperitoneum and aorta remain unopened; thus, the surgical fields for CRC surgery and artificial blood vessel placement are completely separate, and the risk of infection in the artificial blood vessel is reduced.

Laparoscopic colectomy is less invasive compared with open colectomy for the treatment of colon cancer in terms of postoperative recovery^{11,12)}. This is advantageous in terms of surgical stress in patients with AAA and concomitant colon cancer. However, it is difficult to secure the field of view due to AAA, and the shaft of the forceps compresses the AAA, which may cause endoleak and thrombotic obstruction.

In our case, we were able to safely perform simultaneous surgery. We did not anastomose, as we aimed to reduce the risk of death due to severe complications. It is thought that this case can anastomose some other time while seeing a general status. In high-risk cases, such as with the patient in the present report, if the two-stage approach is performed, exacerbation of the patient's general condition could render subsequent treatment impossible. However, the one-stage approach enabled us to avoid this situation.

In conclusion, one-stage management with minimal-

ly invasive synchronous EVAR and laparoscopic surgery may provide an alternative method for patients with large AAA and advanced colon cancer.

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Ethical Statement

This study followed the declaration of Helsinki on medical protocol and ethics and all participants signed an informed consent agreement.

Conflicts of Interest

All authors declare that they have no conflict of interest.

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