Simultaneous Endovascular Aneurysm Repair and Distal Gastrectomy in a Patient with Concomitant Abdominal Aortic Aneurysm and Advanced Gastric Cancer

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The optimal surgical management of patients with concomitant abdominal aortic aneurysm (AAA) and gastrointestinal malignancy remains controversial. A 79 year-old man who presented with hematemesis was found to have advanced gastric cancer concomitant with infrarenal AAA. The patient underwent simultaneous endovascular aneurysm repair (EVAR) and distal gastrectomy. The postoperative course was uneventful. The present case illustrates the clinical utility of EVAR for the high-risk patient with concomitant AAA and gastrointestinal malignancy.

Keywords: abdominal aortic aneurysm; endovascular aneurysm repair; gastric cancer

INTRODUCTION

In recent years, the extended average life span has brought a high rate of malignancies associated with cardiovascular diseases. In particular, the incidence of gastrointestinal malignancies concomitant with abdominal aortic aneurysm (AAA) has also increased. Although cancer progression and aneurysmal rupture are both life-threatening events in patients with these clinical entities, current treatment strategy for this condition remains controversial.

We report a successful case of simultaneous endovascular aneurysm repair (EVAR) and distal gastrectomy for AAA and advanced gastric cancer.

CASE REPORT

A 79 year-old man was admitted to a general hospital for the investigation of sudden hematemesis. He was noted to be suffering from general fatigue and appetite loss with 5 kg weight loss in a month. Upper gastrointestinal examination with contrast medium revealed a mass, 55 × 50 mm in size, on the anterior wall of the gastric antrum, and gastrointestinal fiberscopy showed a hemorrhagic tumor compatible with a Bormann type III gastric cancer, and the bleeding was successfully stopped with an endoscopic hemoclip (Fig. 1). He was given a blood transfusion and recovered smoothly. A biopsy specimen demonstrated moderately to poorly differentiated adenocarcinoma.

Computed tomography (CT) revealed a massive infrarenal AAA that measured 81 mm in maximum diameter (Fig. 2A). 3-dimensional computed tomography (3D-CT) showed the fusiform AAA with severe anularized proximal neck (Fig. 2B). We diagnosed the disease as advanced gastric cancer concomitant with AAA. Then he was referred to our institution for the operation of both lesions.

On physical examination, his conjunctivae were pale, but not icteric. A pulsating mass was palpated in his abdomen. Laboratory tests showed renal dysfunction with...
an elevated serum creatinine level (1.25 mg/dl). After we had discussed the surgical management including one or two-stage operation and open versus endovascular aneurysm repair (EVAR), we decided to perform the simultaneous EVAR and gastrectomy.

Under general anesthesia, bilateral common femoral arteries were exposed through inguinal incisions. A $28 \times 12 \times 18$ cm bifurcated Gore-Tex (Excluder) stent graft was chosen. The main body of the system was inserted using through the left common femoral artery into the position just below the left renal artery. After optimal position was confirmed by aortography, the main body was deployed successfully. Then both graft limbs were deployed uneventfully. At the end, aortography confirmed type I endoleak. Therefore, a proximal aortic extension (aortic extender $28 \times 30$ mm), used to seal the angulated proximal neck, repaired the endoleak. Thereafter a median-laparotomy was performed. The gastric cancer invaded the transverse mesocolon and middle colic artery. A distal gastrectomy with systemic lymph node dissection was performed.

A postoperative 3D-CT on day 7 confirmed a patent.
endovascular graft in a good position without endoleaks (Fig. 3). The postoperative course was uneventful, and he was discharged on postoperative day 36.

**Discussion**

Although the incidence of patients presenting with concomitant AAA and gastric cancer is low, current treatment strategies in patients with both lesions remains controversial.\(^1-^4\) The most important and difficult decision to make is whether to operate on the malignant lesion first, the AAA first, or both simultaneously. The decision-making may depend on many variables, including surgeon’s experience and preference, local expertise, aneurysm size, and type and stage of cancer. As Szilagyi stated in 1967,\(^1\) it is most important to assess the absolute indications for urgent surgical treatment of each lesion, being a high chance of aneurysm rupture, and such coexistent complications as hemorrhage, obstruction or perforation for the cancer. It is clear that the lesion which has the most dangerous complications should be operated on first.

The use of simultaneous operations for both lesions has several advantages. Risks accompanying total anesthesia, such as pneumonia or drug-induced complications, can be eliminated. Disease progression of the untreated lesion can be prevented. Surgeons have to keep in mind that there is a potential for aneurysm rupture if AAA resection is delayed by staged procedures. Furthermore, the anxiety of patients who are facing two life-threatening lesions is resolved at one time. On the other hand, the major disadvantage of simultaneous operation is the risk of prosthetic graft infection which may result in severe complications. In the present case, we selected the simultaneous operation because of the advanced hemorrhagic cancer and the high possibility of aneurysm rupture. We evaluated that the patient may be unable to tolerate a two-stage operation because of his advanced age and poor general condition.

The evolution of vascular endografts and the reported efficacy of EVAR provide an alternative method for treating complex and high-risk patients with acceptable mortality rate.\(^5-^7\) EVAR results in early recovery and a shorter convalescence compared with open graft replacement. This modality offers potential treatment benefits in patients with suitable anatomy who have concomitant gastrointestinal malignancy.\(^8-^10\) Herald et al. first reported the case of synchronous AAA and colorectal cancer treated entirely by minimally invasive surgery without laparotomy.\(^11\) Since then, several reports have been described simultaneous EVAR and abdominal cancer resection.\(^12-^14\) However, almost all of those reports were undergoing a resection for colorectal cancer. While our present case was a high-risk gastric cancer patient complicated with AAA, so simultaneous EVAR and distal gastrectomy were performed, and a satisfactory outcome was obtained. EVAR should be considered the treatment of choice in high-risk patients, taking into account, however, that this treatment is not always feasible in all cases and that in patients with a normal life-expectancy it may not always be the right choice. Thus, a preoperative evaluation including a psychiatric assessment, especially in aged patients, should be carefully conducted when selecting the appropriate surgical procedure.
In conclusion, we successfully performed simultaneous EVAR and distal gastrectomy in a patient with concomitant AAA and advanced gastric cancer. EVAR is a safe and effective treatment for high-risk patients with a relatively low procedure-related morbidity and no mortality.

**Disclosure Statement**

The authors declare that they have no competing interests.

**References**


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