Case Report

Antibiotics and Drainage for Treating Stent-Graft Infection after EVAR

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The patient was a 64-year-old man. He developed fever and lumbago 6 months after the EVAR. Because CT showed an abscess in the aortic aneurysm surrounding the stent graft, stent-graft infection was diagnosed, and treatment with intravenous antibiotics was initiated. However, the fever and inflammatory markers persisted; therefore, CT-guided drainage catheter placement was performed. After all the pus had been discharged, the fever subsided, and the inflammatory reaction was also suppressed. One year has elapsed since the treatment, and the patient continues to visit with no complaints. We report that stent-graft infection was relieved with antibiotics and drainage.

Keywords: stent-graft infection, evar, antibiotics, drainage

INTRODUCTION

Vascular graft infection is one of the most serious complications after vascular graft surgery, carrying a poor prognosis.1) The principle of treatment of vascular graft infection is the removal of the infected vascular graft, and extra-anatomical bypass is often performed for revascularization.2) However, removal of a stent graft may be difficult in poor-risk patients who have undergone EVAR. In this case, we observed an abscess in the aortic aneurysm surrounding the stent graft after EVAR and treated the stent-graft infection conservatively. We report favorable outcome of the treatment.

Case

A 64-year-old man. He presented to his primary care doctor with fever higher than 39 °C and lumbago. Because anorexia and general prostration were observed, he was transferred to our hospital and admitted immediately. He had undergone endovascular aneurysm repair (EVAR) for saccular abdominal aortic aneurysm (AAA) with a maximum diameter of 50 mm directly above the aortic bifurcation 6 months ago (Fig. 1a). He had undergone total gastrectomy for gastric cancer at another hospital 5 years ago. Anastomotic leakage occurred during the surgery, which resulted in peritonitis as a complication. In consideration of the past history, we decided to perform EVAR. The surgical approach was through the left side. Excluder for the main body: PXT231212 and Contralateral leg: PXL161207 and iliac extender was used PXL161207 for short right common iliac artery (WL Gore & Associates, Flabstaff, AZ, USA).

The hematological study at admission showed CRP 21.0 mg/dL, WBC 19.1 × 10³/μL, an increase in the serum level of C-reactive protein and leucocytosis. Moreover, presence of WBCs in urinary sediment was 2+. Urinary tract infection was suspected, and the patient was started on treatment with intravenous meropenem (MEPM), an antibiotic. However, because the fever and inflammatory
markers persisted, an abdominal CT was performed on the 2nd hospital day.

A low density area with a septum was observed around the stent graft (Fig. 1b). No leakage of contrast medium into the intestinal tract potentially suggestive of intestinal fistula was observed. An abscess in the aortic aneurysm surrounding the stent graft was diagnosed, and the intravenous antibiotic treatment was continued. Because the fever and inflammatory reactions still persisted, surgical treatment was also considered. However, removal of the stent graft was considered difficult due to the past history of peritonitis in the patient after surgery for gastric cancer. Thus, to identify the infecting bacteria and improve the general condition of the patient, CT-guided translumbar drainage catheter placement was performed on the 5th hospital day after admission. CT images were obtained with the patient in the prone position, and a marker was placed; then, puncture was carefully performed. After confirming the absence of blood, we placed two 7-Fr pig tail catheters for percutaneous transhepatic gallbladder drainage, and approximately 20 mL drainage of milky-brown purulent fluid was noted (Fig. 2). After all the pus had been discharged, the fever subsided, and the inflammatory reaction was also suppressed. Despite continuous aspiration drainage and frequent cultures of the drained fluid, no bacteria were isolated. On the 13th hospital day after drain placement, the site of drainage catheter placement was changed fluoroscopically due to the detection of residual abscess. By the 24th hospital day, the abscess had almost disappeared. However, because occlusion of the catheter was a concern, drainage catheter replacement was performed fluoroscopically. In regard to the use of antibiotics, MEPM was used from the time of admission to the 13th hospital day after drain placement. When MEPM was replaced with vancomycin (VCM) on the 14th hospital day, the patient again developed fever; therefore, VCM was replaced with cefozopran (CZOP). Then, CZOP was replaced with ciprofloxacin (CPFX) on the 33rd hospital day. Because drug eruption was observed after CPFX infusion, it was discontinued and replaced with cefpirome (CPR) on the same day. The abscess cavity disappeared by the 50th hospital day; then, the intravenous antibiotic therapy was stopped and substituted with oral cefcapene pivoxil (CFPN-PI). Neither fever nor increase in inflammatory reactions was observed, and the amount of drained fluid remained stable. Thus, the catheter was removed on the 56th hospital day, and the patient was discharged on the 58th hospital day. In regard to antibiotic treatment, the patient remains on oral CFPN-PI until date. At present, approximately 1 year since his discharge, the patient has shown no evidence of recurrence of infection on follow-up abdominal CT (Fig. 3).
Aortic stent-graft infections are rare. Although there are a few case reports of stent-graft infection after EVAR, most of them describe stent-graft infection with an aortoduodenal fistula; however, cases without an intestinal fistula, as in our patient, may be rare. Sharif et al. emphasize that early diagnosis and prompt treatment may be necessary for achieving a favorable outcome.

Some reported that the most favorable outcome was achieved with total excision of a stent graft as a treatment strategy for stent-graft infection and by in situ revascularization as surgical therapy. On the basis of these reports, it is conceivable that conservative therapy may not be the best treatment option. However, we considered that the cure rate of conservative therapy is approximately 60% and that this treatment strategy may be one of the valid options for poor-risk patients, like our patient. Our patient here had a past history of peritonitis occurring as a complication due to anastomotic leakage after total gastrectomy for gastric cancer, extensive adhesion of intraperitoneal organs was expected. We decided to perform EVAR, and it was considered that removal of the stent graft might prove extremely difficult. According to the principles of infection treatment, translumbar drainage was performed to drain the pus and identify infecting bacteria. After the drainage, the patient’s symptoms were dramatically alleviated, and he showed excellent response to antibiotics and drainage. However, when control of the infection became impossible, it was considered that removal of a stent graft and revascularization was necessary.

At the time of EVAR for the saccular AAA, Hematological findings were CRP, 0.1 mg/dL; and WBC, $4.5 \times 10^3/\mu L$. Therefore, infection-sign was not recognized. As for the causal bacteria of the stent-graft infection, no bacteria were isolated, because severe urinary tract infection was suspected at admission, and carbapenem was administered according to the principles of empiric therapy before drainage of the abscess in the aortic aneurysm surrounding the stent.

**DISCUSSION**

![CT-guided translumbar drainage catheter placement.](image1)

Placement of two 7-Fr pig tail catheters for percutaneous transhepatic gallbladder drainage catheter was performed.

![Abdominal CT.](image2)

One year after the treatment, the patient has shown no evidence of recurrence of infection.

![CT-guided translumbar drainage catheter placement.](image3)
graft. Although any microorganism can cause infection of aortic aneurysm, the common pathogenic bacteria are the Gram-negative salmonella bacilli and Gram-positive streptococci. In our patient, although carbapenem and the 4th-generation cephem proved effective for the fever during follow-up, the fever relapsed after the start of administration of a glycopeptide antibiotic. Gram-negative bacilli were, therefore, suspected as the cause in our case, and the patient was continued on oral treatment with the 4th generation cephem. At present, approximately 1 year after the treatment, the patient has shown no evidence of recurrence of infection. He is currently under outpatient monitoring, and long-term follow-up is necessary.

CONCLUSION

We report that stent-graft infection after EVAR was relieved by conservative therapy with antibiotics and drainage. On the basis of reports by experts, though, conservative therapy may not be the best treatment option. However, we consider that the cure rate of conservative therapy may be approximately 60% and that it is a valid option for poor-risk patients, such as those with cancer or a past history of peritonitis, like our patient. Long-term follow-up of the patients is, however, necessary.

DISCLOSURE STATEMENT

Hiroshi Masuhara and co-authors have no conflicts of interest.

REFERENCES