

Efficacy of Computed Tomography-Guided Catheter Drainage as the Initial Intervention and of Omentopexy as the Staged Surgery for a Prosthetic Graft Infection of Very Late Onset

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On the basis of computed tomography (CT) examination, a prosthetic graft infection of very late onset was suspected in a 72-year-old man who had undergone replacement of an bifurcated prosthetic graft 6 years earlier because of an abdominal aortic aneurysm and bilateral common iliac artery aneurysms. Emergency CT-guided needle aspiration was performed, and analysis of directly aspirated fluid confirmed the rapid diagnosis. Instead of conventional emergency surgery, CT-guided catheter drainage was the initial treatment and led to the gradual improvement of symptoms and laboratory data. Elective staged surgery was performed later to examine the cavity around the prosthetic graft. The cavity was then filled with in-situ omentum. Thus, CT-guided catheter drainage as the initial treatment and following omentopexy as the staged surgery avoided the need for highly invasive conventional surgery. (J Nippon Med Sch 2016; 83: 203–205)

Key words: late-onset prosthetic graft infection, computed tomography-guided needle aspiration, catheter drainage, omentopexy

Introduction

Prosthetic graft infection is a rare, life-threatening complication¹. This complication is classified as being of early or late onset², and most late-onset cases are difficult to diagnose, because the symptoms are not always typical of infection^{2,3}. The conventional treatment for prosthetic graft infection is invasive surgery in which the infected graft is removed through debridement of the surrounding infected tissue, maintenance of a distal blood supply to prevent organ ischemia, and antibiotic therapy⁴. Furthermore, conventional surgery frequently has a poor outcome⁴. We used a minimally invasive technique of computed tomography (CT)-guided catheter drainage and subsequent omentopexy to successfully treat a patient with prosthetic graft infection of very late onset.

Case Presentation

A 72-year-old man, who had undergone replacement of a bifurcated prosthetic graft 6 years earlier for an abdominal aortic aneurysm and bilateral common iliac artery

aneurysms, came to our emergency room because of a sudden high fever (39°C) and pain of the back and abdomen. Laboratory results were as follows: white blood cell (WBC) count, 15,600/ μ L; C-reactive protein (CRP) concentration, 30.88 mg/dL; and procalcitonin concentration, 0.81 ng/mL. A CT scan revealed a localized cavity with fluid collection around the bifurcation of the prosthetic graft. Emergency CT-guided needle aspiration of this cavity yielded pus, allowing rapid and direct diagnosis of a prosthetic graft infection of very late onset. A pigtail catheter was inserted into the cavity under CT guidance to drain the abscess (**Fig. 1**), and cefazolin (4 g/day) was administered as an infusion antibiotic. Methicillin-sensitive *Staphylococcus aureus* was detected both in the cavity and in the blood.

By the 9th day of drainage the clinical symptoms had gradually improved, as had the laboratory results, as follows: WBC, 8,600/ μ L; CRP, 3.53 mg/dL; and procalcitonin, 0.19 ng/mL. The following day, a more radical, elective, staged surgery was performed to examine the

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Fig. 1 Image of computed tomography-guided catheter drainage

A pigtail catheter was inserted through the left psoas muscle (**arrow**) into the localized cavity around the bifurcation of the prosthetic graft and reduced the volume of the cavity.



Fig. 3 Computed tomography scan on the 22nd day after elective staged surgery

In-situ omentum was inserted into the cavity around the prosthetic graft, and the volume of fluid was (**arrow**).

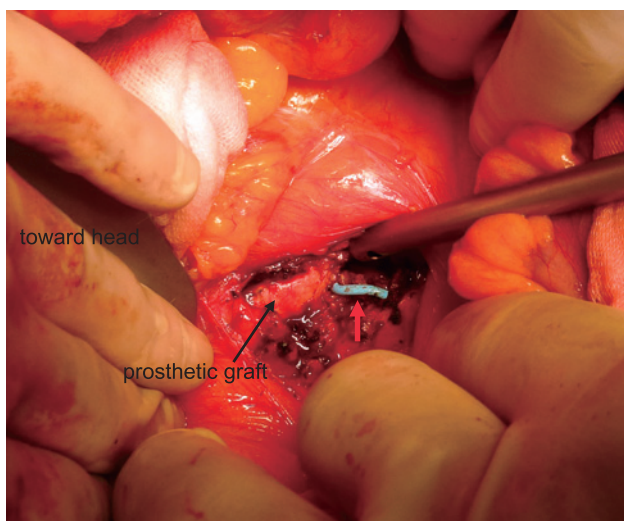


Fig. 2 Intraoperative image after the retroperitoneum of the cavity around the prosthetic graft was reopened.

No abnormalities were found in the abdominal cavity. A pigtail catheter was inserted into the cavity around the prosthetic graft (**red arrow**); the absence of fluid indicated that the cavity had been effectively drained. The cavity wall was almost completely healed.

cavity. The retroperitoneum was reopened and showed no abnormalities in the abdominal cavity, and insertion of a pigtail catheter revealed no fluid (**Fig. 2**). Therefore, the infection was believed to have healed. The cavity was filled with in-situ omentum, and cefazolin (4 g/day) in-

fusion was continued for 1 month after the staged surgery. The laboratory data on the 22nd day after the staged surgery showed normal levels: WBC, 6,900/ μ L; CRP, 0.83 mg/dL; and procalcitonin, 0.07 ng/mL. A CT scan on the 22nd day after the staged surgery showed that the prosthetic graft was covered with in-situ omentum and no fluid collections were identified (**Fig. 3**). The patient was discharged with a prescription of amoxicillin (1,000 mg/day, orally) on the 36th day after the staged surgery without any complications. Eighteen months later, no signs of recurrence were observed.

Discussion

Immediate CT-guided needle aspiration and subsequent catheter drainage allowed us to quickly diagnose (within 2 hours) a prosthetic graft infection in a 72-year-old man, to identify the bacteria responsible, and to treat the patient with appropriate antibiotics: cefazolin during hospitalization and amoxicillin upon discharge. The initial treatments gradually alleviated the infection and later allowed for curative surgery, including omentopexy. We believe this combination of CT-guided catheter drainage and staged surgery was the optimal treatment for this patient in both the short and long terms.

The combination of catheter drainage and antibiotic therapy has recently been shown to be a satisfactory, minimally invasive alternative in cases of prosthetic graft infection not involving anastomoses^{5,6}. The prosthetic graft infection of our patient was in group 3 of the Sam-

son classification, indicating that CT-guided catheter drainage with cefazolin infusion would be a good option^{5,6}. However, no guidelines for the duration of catheter drainage have been established, and the catheter can lead to a secondary infection. Moreover, in cases similar to the present case, drainage and use of an antibacterial agent has achieved imperfect results⁷, and whether this treatment prevents late recurrence is unknown. Therefore, on the 10th day after catheter drainage we also performed a more radical, elective, staged surgery for our patient to directly examine the cavity around the prosthetic graft. This surgery allowed us to judge with confidence that omentopexy in the cavity without removal of the prosthetic graft was an appropriate treatment for our patient. Consequently, the initial use of CT-guided catheter drainage helped decrease the infection and made the elective staged surgery less invasive.

Because of its abundant lymphoid tissue, omentum has beneficial effects on infective tissues by regenerating blood vessels and eliminating substrates for bacterial growth^{8,9}. Consequently, omentum is considered the best choice for controlling infection and is widely used to treat mediastinitis after cardiac surgery⁸⁻¹⁰. Therefore, in our patient we filled the cavity with in-situ omentum and used it to cover the prosthetic graft.

With interventional radiology, conventional emergency surgery might not always be necessary as the primary treatment in cases of prosthetic graft infection. Omentopexy after CT-guided catheter drainage and antibiotic therapy might be preferable, especially in high-risk cases⁵⁻¹⁰.

Conflict of Interest: The authors declare no conflict of interest.

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