

## 症 例

## Successful *in Situ* Graft Replacement with Homograft for Infected Abdominal Aortic Aneurysm

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### Introduction

Infected abdominal aortic aneurysms are infrequent, but difficult to treat. The basis of their surgical treatment includes resection of the infected aorta, debridement of surrounding tissue, aortic reconstruction with extra-anatomical bypass or *in situ* graft replacement, and perioperative antibiotic therapy<sup>1)</sup>. We report a successful case of sufficient preoperative antibiotic treatment and elective operation in which arterial reconstruction was performed with a homograft.

### Case

A 54-year-old woman was admitted to another hospital with severe back pain and gastrointestinal symptoms. Hospitalization was needed for systemic inflammation. At that time, marked elevations of white blood cell count and C-reactive protein were present. Blood culture detected  $\alpha$ -streptococcus and computed tomography revealed an infra-renal abdominal aortic aneurysm (39 mm maximum diameter) with a thickened aortic wall, periaortic mass (mantle sign) and local dissection (Fig. 1). The clinical

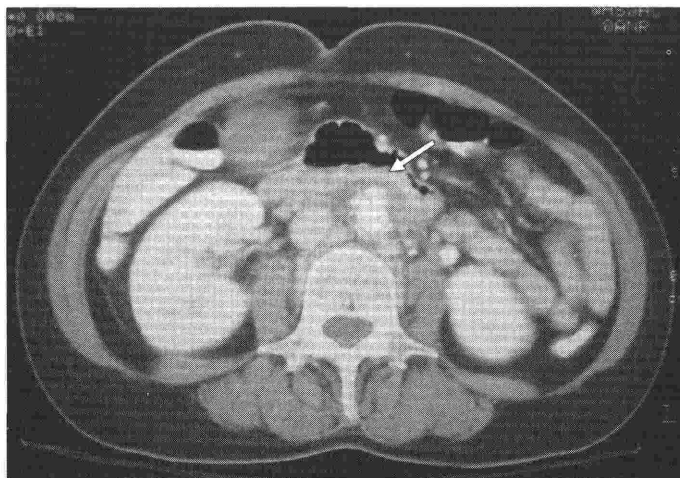


Figure 1

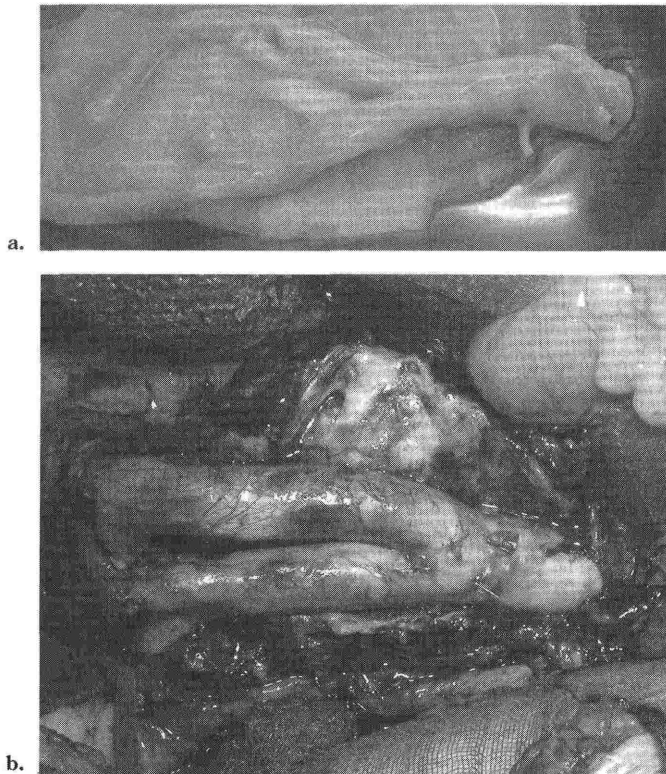
Preoperative computed tomography showed an infra-renal abdominal aortic aneurysm with thickened aortic wall, periaortic mass (mantle sign), and local dissection (arrow).

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diagnosis of infected abdominal aortic aneurysm was made. Antibacterial therapy (ampicillin 12 g/day) was administered. When she was referred to our hospital, she had no organ dysfunction. However, inflammatory laboratory data were still high (white blood cell count 14,400/ $\mu$ l, C-reactive protein 13.6 mg/dl).

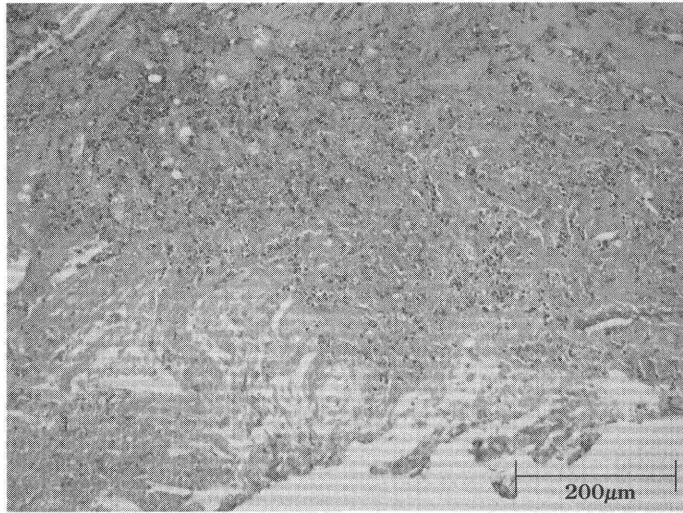
An elective operation was planned after three weeks of antibacterial therapy in our hospital. Antibacterial therapy was effective, and inflammatory laboratory data settled (white blood cell count 5,960/ $\mu$ l, C-reactive protein 0.59 mg/dl). Under general anesthesia with the patient in a supine position, median laparotomy was performed. Although marked adhesion was observed around the infra-renal abdominal aorta, there was no infective pus. Careful dissection was performed around the aorta, and the left renal vein and bilateral common iliac arteries were isolated.

After systemic heparin administration, the infra-renal aorta and bilateral common iliac arteries were clamped. Then the aneurysm was incised longitudinally, and the thickened aneurysmal wall was resected and sent for pathologic and bacterial examination. Aortic reconstruction was performed by *in-situ* graft replacement with a homograft (infra-renal portion, **Fig. 2a**). The native infra-renal portion was anastomosed to the same site of the homograft with #3-0 monofilament continuous sutures, and the native bilateral common iliac arteries were anastomosed to the external iliac arteries of the homograft with #4-0 monofilament continuous sutures. All anastomoses were performed in an end-to-end fashions. The internal iliac arteries of the homograft were closed with #4-0 monofilament sutures. The inferior mesenteric artery was not reconstructed. Hemostasis was confirmed and the retro-peritoneal space was closed



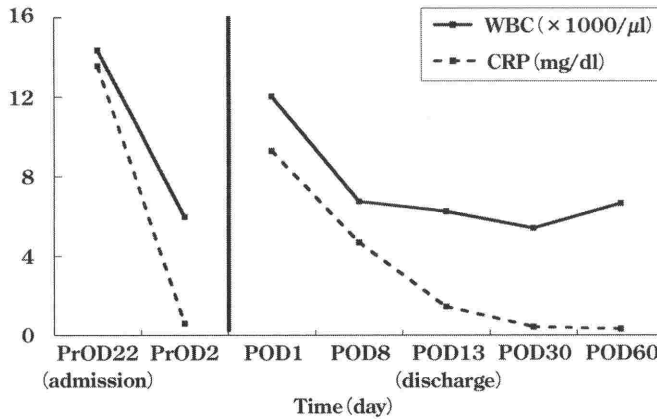
**Figure 2**

- a. Homograft (infra-renal portion).
- b. Intraoperative view. Arterial reconstruction was established by *in situ* graft replacement with a homograft. Although the native aortic wall was thickened, but there was no infective pus in the retroperitoneal space.



**Figure 3**

Pathological study revealed marked infiltration of neutrophils and tissue necrosis.



**Figure 4 Clinical course.**

Antibiotic therapy was carried out from PrOD22 to POD8.

PrOD, preoperative day, POD, postoperative day

without an omental flap. The abdomen was closed in layers.

Although no bacteria were isolated from the culture specimens, histological study revealed marked infiltration of neutrophils and tissue necrosis (Fig. 3).

Inflammatory laboratory data settled after antibacterial therapy for 4 weeks in the perioperative period (Fig. 4). Postoperative computed tomography revealed neither leakage nor dilatation at the anastomotic site. About seven months after operation, the laboratory data showed no elevation of inflammatory markers.

**Discussion**

The surgical strategy for infected abdominal aortic aneurysm is very controversial<sup>2)</sup>. First, the timing of operation should ideally be postponed until inflammation has settled, in order to avoid recurrent graft infection. However, application of this strategy for all cases might lead to an increase in preoperative aneurysm rupture. In this case,  $\alpha$ -streptococcus was detected in blood culture, then ampicillin (intravenous drip), which is effective for this bacterium, had been started. Because there was no sign of im-

pending rupture, we planned elective operation after inflammatory data had settled. At the time of operation, there was marked adhesion. However, there was no infective pus around the aorta, and we therefore did not perform omental flap. Although omental flap is considered to be effective to control local infection<sup>3)</sup>, there was no definitive indication. In this case, preoperative inflammatory data settled, and there was no sign of infection in the retroperitoneal space. In addition to the intraoperative findings, negative culture results of the surgical specimen assured that infection had been eradicated. On the other hand, histological study showed marked infiltration of neutrophils and necrosis in the aneurysmal wall, and thus the pathological diagnosis of infected abdominal aortic aneurysm was established.

Second, two different methods of arterial reconstruction are available: extra-anatomical bypass and *in situ* graft replacement<sup>4)</sup>. In recent reports, because of the lower patency of extra-anatomical bypass and the possibility of recurrent infection and rupture of the native aortic stump, *in situ* graft replacement seems to be the favorable treatment for properly selected patients<sup>5)</sup>. In such cases, it is important to be able to remove any infective component completely. Regarding the conduit, homograft has been described as a desirable arterial material<sup>6)</sup>. In this case, we were able to obtain abdominal aortic cryopreserved

homograft from the Tokyo University Tissue Bank, which was donated by a 57-year-old man who died of subarachnoid hemorrhage. We implanted this homograft as an arterial reconstructive conduit. Postoperative computed tomography showed neither anastomotic leakage nor dilatation of the homograft. Inflammatory laboratory data had settled at discharge. To date, there has been no sign of recurrent infection, about seven months after operation.

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