A Case of False Aneurysm of a Dacron Graft in Aortitis Syndrome

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ABSTRACT. Among the complications after grafting of a prosthesis, false aneurysm due to a torn prosthesis is extremely rare. A 56-year-old female was operated on for complete occlusion of the left external iliac artery. A bypass was performed from the left common iliac artery to the left femoral artery in 1971, using a double-velour Dacron graft (Wesolowski) 8 mm in diameter.

In August 1996, the patient noticed a pulsatile mass in her left groin. Angiography revealed a false aneurysm at the site of the graft. On operation, the false aneurysm was found to have formed on the mid-distal-portion of the graft. After resection of the aneurysm, reconstruction was successfully achieved with an 8 mm Gelsoft double velour knitted Dacron graft (It common iliac-femoral bypass). The postoperative course was uneventful. Postoperative angiography showed a well-patented graft. Fractured fibers were noted in the aneurysmal part of the resected specimen. Therefore, the false aneurysm was caused by rupture of the implanted graft.

Key words : Dacron Graft — Nonanastomotic aneurysm

Knitted Dacron prostheses are the most widely used synthetic grafts in arterial reconstruction procedures. The most common complications of synthetic grafts are early thrombosis, infection, and anastomotic false aneurysm. Nonanastomotic aneurysmal formation in a graft, on the other hand, is very rare. This complication, which leads to graft failure through dilatation of the graft, has been reported to occur in 1-3% of patients with a graft replacement, usually within four to six years after surgery. In this report, we present the case of a woman in whom a nonanastomotic aneurysm formed in a Dacron graft which had been implanted 25 years earlier.

CASE REPORT

A 56-year-old female with a chief complaint of a pulsatile and painless mass, 6 cm in diameter, in the left groin was referred to our hospital in August 1996. She had no history of diabetes mellitus, hypertension or hyperlipidemia. Following a diagnosis of aortitis syndrome, she had undergone a left thoracic sympathectomy for left subclavian artery occlusion in 1963 and a left common iliac-common femoral bypass and subclavian

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artery reconstruction with a Wesolowski microknitted Dacron prosthesis and a saphenous vein for left external iliac artery occlusion and right subclavian artery occlusion in 1971 in another hospital. On physical examination, her blood pressure was 108/68 mmHg in the right upper limb, 104/70 mmHg in the left upper limb, and 150/68 mmHg in the right lower limb. Her heart rate was 64/min regular, height 149 cm, body weight 62.5 kg. She had clear breathing sounds and no heart murmur, but right neck bruit. Neither hepatomegaly nor dilatation of the bilateral jugular veins was observed.

Angiography disclosed a false aneurysm protruding on the graft with occlusion of the bilateral subclavian artery. Proximal anastomosis to the left common iliac artery and distal anastomosis to the left femoral artery appeared to be intact (Fig 1). Surgery, performed on September 3, revealed a false aneurysm 6 cm in diameter arising from the graft with no sign of infection (Fig 2). Anastomosis of the graft to the common femoral artery seemed to be intact. The graft aneurysm was excised, and an 8 mm Gelsoft double-velour knitted Dacron graft was inserted to maintain continuity. The patient's postoperative course was uneventful, and postoperative angiography showed a well patented graft. Since the operation was performed, there has been no recurrence of the prosthetic

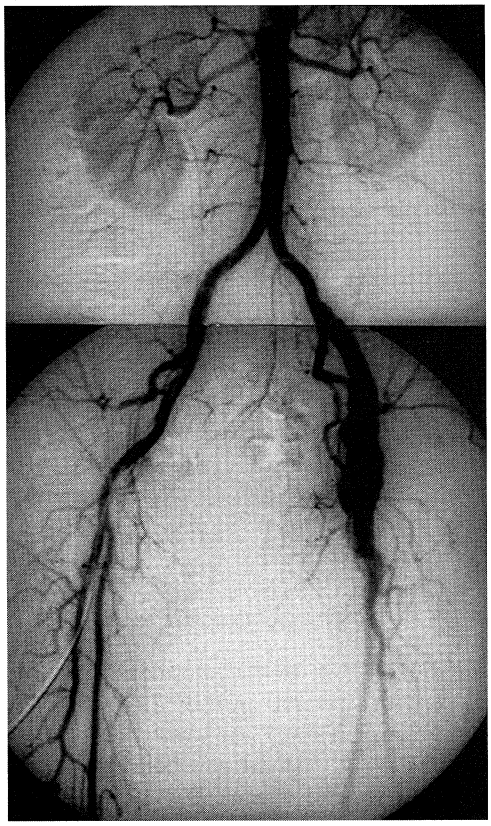

Fig 1. Angiography showed the formation of a false aneurysm on the graft with an intact anastomosis to the left common femoral artery.

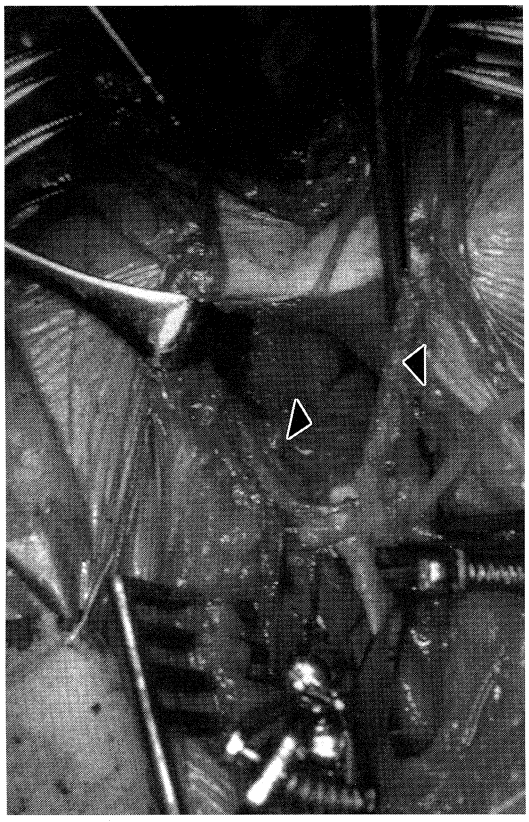

Fig 2. The operative finding showed a false aneurysm 6 cm in diameter arising from the graft without any sign of infection. The white arrow indicates the last graft, and the black arrow indicates the false aneurysm wall.

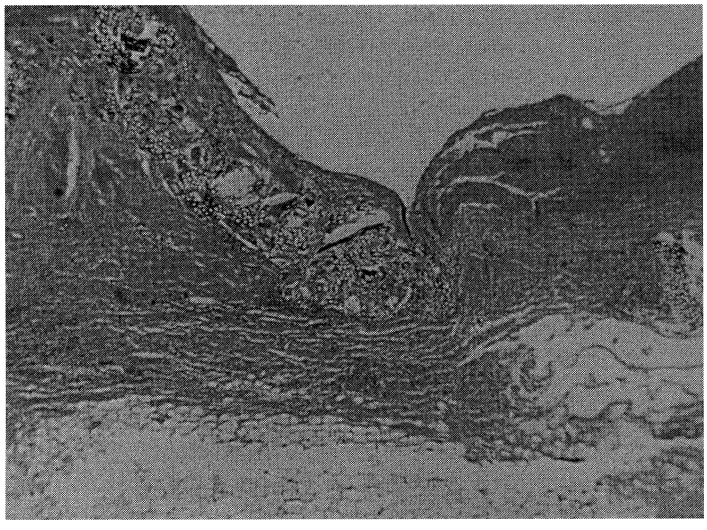

Fig 3. Microscopic examination showed that the Dacron filaments were becoming loose and tapering in a damaged area of the graft (HE stain, ×10).

false aneurysm and the graft has remained patent and is functioning well.

Macroscopically, a resected specimen showed that the graft wall had worn thin and that the Dacron component had disappeared at the summit of the dilatation. Microscopic examination showed that the Dacron filaments were becoming loose and tapering in a damaged area of the graft (Fig 3). Therefore, the false aneurysm was caused by rupture of the implanted graft.

DISCUSSION

Berger and Sauvage,[1] in their study of the late deterioration of grafts, or "graft failure", found this complication in 15 of 493 grafts (3%), while Trippestad[2] reported an incidence of 4 in 300 grafts (1.3%).

Dacron prostheses have proven to be the most reliable substitute for arterial replacement and the formation of an aneurysm within a Dacron graft is sextremely rare. In fact, only 26 such aneurysms in a total of 25 patients have been documented in the Japanese literature.[3-22] The primary diseases which necessitated arterial reconstruction in these patients included an abdominal aortic aneurysm in 4, arteriosclerosis obliterans in 15, trauma in 1, Leriche's syndrome in 1, aortitis syndrome in 2, and unidentified disease in the remaining 2. The reconstructive procedures used were aortobifemoral or -biiliac bypasses in five patients, aorto -or iliofemoral bypasses in eight, a femoropopliteal bypass in two, axillofemoral bypasses in eight, an interposition graft in one, and unknown surgical procedures in two. The grafts used for reconstruction were a Cooley double-velour knitted Dacron graft in eight patients, a Dacron graft and a DeBakey knitted Dacron graft in three each, a DeBakey double-velour knitted Dacron graft and a Wesolowski microknit graft in two each, and a Cooley knitted Dacron graft, a woven Dacron graft, an amylon-polyethylene graft, a Milliknit Dacron graft, a knitted Teflon graft, a knitted Dacron graft, an ePTFE, and an unknown graft in one each. In these patients, the interval from implantation of the prosthesis to the time when the operation for graft aneurysm was performed ranged from 7 months to 25 years with a mean of 7.3 years, although aneurysm formation could have occurred at any time during this period.

It is weel known that deterioration of Dacron prostheses is caused by structural defects, damage during handling, biological reactions, and mechanical fatigue. In the 25 cases reported in Japan, aneurysms arising from grafts were located in the inguinal region in 10 patients and near the costal arch in 4. This suggests that chronic mechanical stress caused by biological tissues, such as the inguinal band or costal arch, preceded formation of the graft aneurysm. The histological findings in the resected graft from our patient also suggested that long-term mechanical fatigue caused by the inguinal band preceded the deterioration of the Dacron graft filament. Therefore, either the inguinal band should be cut or external support should be provided for the grafts in implantation procedures to prevent aneurysm formation in the graft.

In conclusion, long-term graft surveillance is required because graft failure may occur at any time after the implantation of a prosthesis.

Furthermore, procedures to prevent or reduce mechanical stress caused by biological tissues are mandatory to avoid aneurysm formation in the graft.

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