

Late Rupture of Knitted Dacron Graft

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An 87-year-old man underwent aorto-bifemoral bypass using a bifurcated Bionit II knitted Dacron graft for high aortic occlusion in 1987 at another hospital. In November, 2004, he was admitted to our institution because of difficulty in walking due to swelling and tenderness in the right groin. Computed tomography (CT) scan indicated bilateral aneurysms of the grafts in the groins. The size of the right and left aneurysms were 73 mm and 52 mm, respectively. Angiography showed some extravasation in the right thigh. We performed surgical replacement of all the dilated parts with new ringed-Dacron grafts. We report a rare case of late rupture of bifurcated Sauvage Bionit II Dacron graft. (Ann Thorac Cardiovasc Surg 2005; 11: 343–5)

Key words: knitted Dacron graft, late rupture

Case Report

An 87-year-old man who had suffered from rest pain in the right leg underwent aorto-bifemoral bypass using bifurcated Bionit II knitted Dacron grafts for high aortic occlusion and right femoro-popliteal bypass for stenosis of superficial femoral artery using an autologous saphenous vein graft (ASVG) in 1987 at another hospital. The right leg of the bifurcated graft was anastomosed to the profunda artery and the ASVG was anastomosed to the graft end-to-side. The postoperative course was unremarkable. He had been medicated for hypertension by his family doctor for many years. He had a past history multiple brain of infarcts without any sequelae.

In November, 2004, he was admitted to our institution due to difficulty in walking because of swelling and tenderness in the right groin. We found a pulsatile mass in the groin with subcutaneous hemorrhage. The right thigh was swollen. There was also a pulsatile mass in the left groin without any color change. Emergent angiography

showed an aneurysm of the right artificial graft near the proximal anastomosis of the ASVG with some extravasations. The bilateral grafts were slightly dilated just below the inguinal ligaments. There was no extravasation in the left thigh (Fig. 1). Computed tomography (CT) scan indicated bilateral aneurysms of the grafts with mural thrombus. The size of the right and left aneurysms were 73 mm and 52 mm, respectively. There was some enhancement in the right mural thrombus which indicated rupture of the graft. The right thigh was swollen with hematoma amongst the muscles (Fig. 2). His vital signs were stable and he was operated on two days after the diagnosis was made.

The operation was done under general anesthesia in a supine position. We started with the right leg. The proximal and the distal part of the aneurysm were encircled and clamped. On opening the aneurysm, there was much thrombus and we could not find any artificial graft segments. The graft was absent at the graft-to-profunda artery anastomosis leaving the ASVG intact. We were able to see the entire orifice of the profunda artery. We attributed the rupture of the pseudo-aneurysm to disruption of the dacron graft near the distal anastomosis. Control of back flow from the profunda artery by balloon catheter was not enough, hence we first did the distal anastomosis to the orifice using a new 10 mm-ringed Dacron graft. The detached ASVG was interposed by ringed Gore-

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Received January 19, 2005; accepted for publication March 28, 2005.

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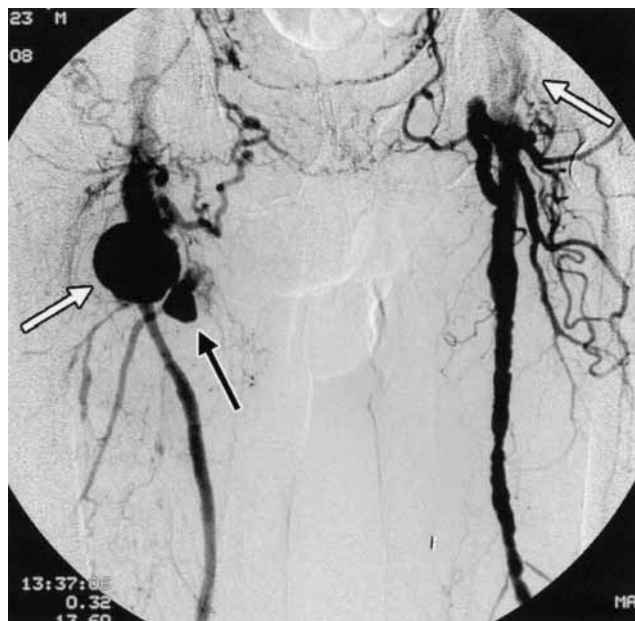


Fig. 1. Preoperative angiography shows bilateral aneurysms of prosthetic grafts (white arrows) and some extravasation (black arrow).

Tex 6 mm. The left aneurysm was opened in the same way. The graft had been ruptured along the anterior black line of the graft. The ruptured site was similarly interposed by 10 mm-ringed Dacron graft.

Postoperative angiography showed no remaining aneurysm and a patent ASVG. Microscopic examination of the resected specimen revealed a few graft fibers in the

pseudo-aneurysm indicating preexisting dilatation of the Dacron graft (Fig. 3). The hematoma and the swelling of the right thigh gradually subsided. He left our hospital on foot two weeks after the operation.

Discussion

We report a rare case of late rupture of knitted Dacron graft 17 years after the initial operation. Because there were a few fibers in the aneurysms on microscopic examination, rupture may have followed dilatation of the grafts. Aneurysms existed in both groins, thus flexion and extension of the thigh may have affected the mechanical deterioration of the grafts. There are number of reports about aneurysm or late disruption of Cooley double velour knitted Dacron graft,¹⁻⁷⁾ but that of Sauvage Bionit grafts like this case is very rare.⁸⁻¹⁰⁾ Orii et al. reported a pseudo-aneurysm of 6 mm in an externally supported, knitted Dacron graft inserted in 1987, the same year of our case.¹⁰⁾

It has been estimated that intrinsic Dacron graft failure occurs in approximately 0.5% to 3% of patients. The average time from implantation to detection of graft failure is reported to be 77 months or 6.4 years.⁸⁾ The reason for this complication is not clear, but may include fabrication flaws, faulty preoperative handling related to methods of sterilization, intra-operative damage, bio-deterioration related to hematomas or infection, and mechanical or structural fatigue.¹¹⁾ Most cases are knitted Dacron

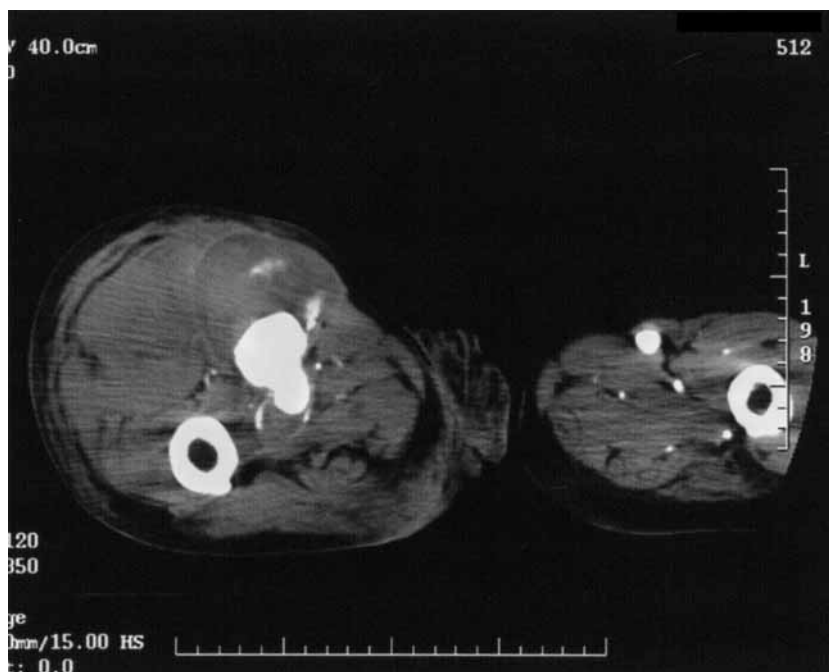


Fig. 2. CT scan shows a 73 mm arterial aneurysm near the right distal anastomosis of the Dacron graft.

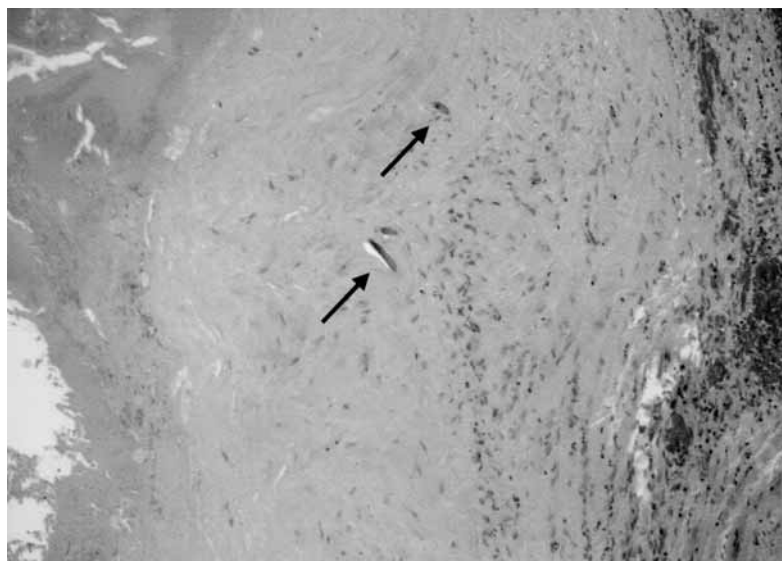


Fig. 3. Photomicrographs of the left aneurysmal wall. There are some graft fibers in the connective tissue (arrows). This indicates underlying expansion of the Dacron graft.

grafts, not woven Dacron grafts. Okabe et al. reviewed 33 cases of non-anastomotic aneurysm formation and 21 of them were in knitted Dacron grafts. The position of the aneurysm was in the groin in aorto-iliac or aorto-femoral bypass grafts in most cases, followed by costal arch in axilo-femoral bypass grafts.¹²⁾ Initially, we should select the iliac artery, not the femoral artery, for the distal anastomosis to avoid late mechanical fatigue.

In consideration of the possibility of late disruption of Dacron grafts, patients need a regular and long term follow up. CT scan and physical examination are very useful for this purpose. The diagnosis should be made as early as possible before fatal hemorrhage occurs. Angiography is mandatory to detect slight dilatation of the graft and for the appropriate surgical approach. At the operation, all the dilated parts should be removed. Inclusion technique for the anastomosis is inevitable when there is difficulty in ablation of the graft from surrounding tissue.

We present a rare case of late rupture of bifurcated Sauvage Bionit II Dacron graft. We performed surgical replacement of all the dilated parts by new ringed-Dacron grafts. Further follow up of the other parts of the old graft is mandatory.

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