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CASE REPORT

Recanalisation of the Native Artery Following Failure of a Bypass Graft

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Introduction

Postoperative graft thrombosis is a major complication of arterial surgery which may lead to recurrent ischaemic symptoms. Long-term graft patency rates following operative thrombectomy remain poor.[1,2] However, some patients may have lesions within the native artery which are nowadays amenable to treatment with percutaneous transluminal angioplasty. We describe two cases of successful recanalisation of the native artery by subintimal angioplasty, following previously failed arterial bypass grafts.

Case Reports

Case 1

A 55-year-old man presented with a 6-year history of severe right calf claudication. He was a non-smoker. A transfemoral arteriogram revealed a 15-cm occlusion of the right popliteal artery. Percutaneous transluminal angioplasty (PTA) was attempted on two separate occasions but failed to cross the lesion. He therefore underwent a right below-knee femoro-popliteal bypass using reversed saphenous vein.

Five years later he presented with recurrent severe right calf claudication. An arteriogram revealed a blocked right femoro-popliteal vein bypass graft (Fig. 1a). The native right superficial femoral artery (SFA) and the popliteal occlusion were visualised. The length of the occlusion was the same as 5 years previously (15 cm).

The patient underwent repeat angioplasty of the native popliteal artery using subintimal recanalisation. The subintimal angioplasty technique has been previously described elsewhere.[3] This technique involves initiating a dissection at the origin of the occlusion with a guidewire (3 cm floppy, 150 cm long, 0.035 inch diameter; Meadox, Dunstable, U.K.), sometimes using the hard end of the wire. Once a dissection has been created, a guidewire (1.5 mm 'J' tipped, 0.035 inch diameter; Meadox) is looped within it and advanced forward which enables re-entry into the lumen distal to the occlusion. A 4-cm long, 5-mm diameter balloon angioplasty catheter (Schneider U.K. Ltd, Windsor, Berkshire, U.K.) was inflated within the subintimal space to enable recanalisation. A good angiographic result was obtained (Fig. 1b). He was subsequently followed up for 18 months with Doppler ankle pressure measurements and the recanalised native artery remains patent.

Case 2

A 64-year-old man presented with increasing bilateral calf claudication. His risk factors included cigarette smoking and hypertension. A clinical diagnosis of bilateral SFA occlusion was made. A transfemoral arteriogram confirmed a 2-cm stenosis in the middle segment, and a 10-cm occlusion in the distal segment

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of the right SFA. On the left, there was a 7-cm occlusion in the SFA.

The left SFA occlusion was successfully recanalised with PTA, using a 7F, 4-cm long and 6-mm diameter balloon angioplasty catheter (Schneider U.K. Ltd, Windsor, Berkshire, U.K.). However, the right side could not be treated by angioplasty because of failure to cross the lesion. Therefore a femoro-popliteal polytetrafluoroethylene (PTFE) bypass graft was performed.

Ten months following the bypass graft the patient presented with recurrent right calf claudication. A Duplex scan confirmed occlusion of the graft. PTA of the native SFA was attempted using a 5F, 4-cm long and 6-mm diameter balloon angioplasty catheter (Schneider U.K. Ltd, Windsor, Berkshire, U.K.). The occlusion was successfully recanalised using subintimal angioplasty. The patient has subsequently been followed up for 11 months with Doppler ankle pressure measurements and the recanalised native artery remains patent.

Discussion

Although graft surveillance programmes have dramatically increased the patency of infrainguinal bypass grafts,[4] some patients still present with recurrent ischaemic symptoms due to graft thrombosis.

The outcome of these grafts is poor, with long-term patency rates following thrombectomy or thrombolysis ranging from 19 to 28%.[1,2] In recent years there have been considerable advances in interventional radiology, with availability of steerable guide wires, low profile balloon angioplasty catheters and the development of subintimal angioplasty technique.[3] As a result of this some of the lesions which were previously treated with arterial bypass surgery can now be treated with PTA.

Harris *et al.*[5] have previously described the technique of PTA of the original occlusive lesion within the native artery after failed femoropopliteal bypass. In both of our patients subintimal angioplasty was used to recanalise the native artery. Subintimal

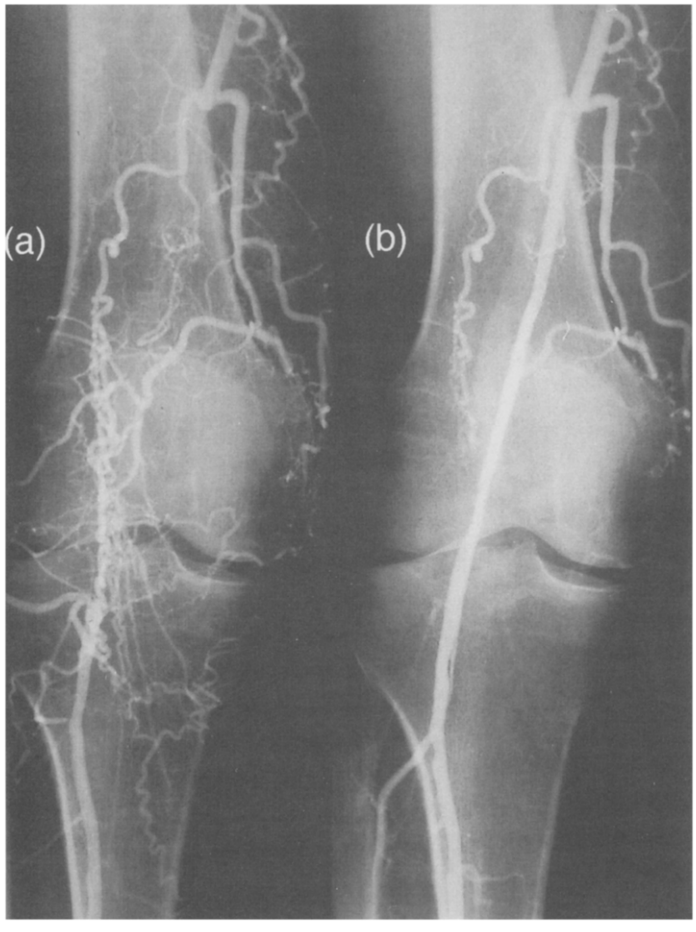

Fig. 1. The angiographic appearances showing (a) the occlusion of femoro-popliteal vein bypass graft, and (b) the recanalised native popliteal artery.

angioplasty for femoro-popliteal artery occlusion was first described in 1990[3] and subsequent follow-up of 200 consecutive angioplasties has shown a 71% patency rate at 12 months which compares favourably with conventional angioplasty.[6] Subintimal technique allows successful recanalisation in long or hard occlusions in which conventional intraluminal approach often fails due to difficulty in crossing the lesion. Patients with diffuse atheromatous disease who have an occlusion also benefit from subintimal angioplasty. Intraluminal approach in these patients often fails, resulting in a dissection. The majority of arterial occlusions are suitable for subintimal angioplasty, except where the occlusion is short (< 5 mm) or of recent onset (3–6 months).[6]

In the two patients described in this report the recanalised native arteries have remained patent at 18 and 11 months respectively. These results are very encouraging in patients who have blocked grafts but where the SFA occlusion is still suitable for recanalisation. Therefore in a selected group of patients presenting with failed infrainguinal bypass, revascularisation can be achieved without undertaking repeat bypass graft surgery, with its inherent risks and technical difficulties.

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