Endovascular native vessel recanalization to maintain limb perfusion after infected prosthetic vascular graft excision

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Prosthetic vascular graft infection is an uncommon yet serious condition. Traditional management has included debridement, excision of the infected graft, and revascularization as needed. We report on two cases in which limb viability was maintained by using endovascular native vessel recanalization after excision of infected prosthetic grafts. This approach was successful in maintaining adequate limb perfusion in both cases. Endovascular native vessel recanalization should be considered as an option to maintain limb viability after excision of infected prosthetic vascular grafts, especially when autogenous conduit is lacking or limitation of the extent of surgery is desirable. (J Vasc Surg 2005;41:332-6.)

Infection of prosthetic vascular grafts has been reported to occur in only 1% to 3% of all arterial reconstructions.[1-3] Nevertheless, when graft infection does occur, the consequences can be unfortunate and associated with a significant rate of limb loss and mortality. Both graft location and infecting pathogen influence these adverse event rates. In the worst situation limb loss rates can be as high as 70%, and mortality rates from 10% to 15%[1,3,4] have been reported.

Management of infected grafts typically consists of debridement of infected tissues, removal of infected prosthetic grafts, and, when necessary, revascularization. Often the overall management of these patients requires a creative mentality, and the variety of therapeutic options should be individualized for each. No single approach is likely to be ideal in all situations.

Here we describe an approach for revascularization after excision of infected grafts involving endovascular recanalization of native vessels. Endovascular recanalization might be desirable in patients with limited physiologic tolerance for major open revascularization or with limited autogenous conduit.

CASE 1.

A 48-year-old diabetic smoker presented to an outside hospital with gangrene of the right 5th toe. She subsequently underwent common femoral to above knee popliteal bypass with a polyethylene terephthalate (Dacron) graft. Her postoperative course was complicated by myocardial infarction, respiratory failure, and acute renal failure. In addition, by postoperative day 8 she had purulent drainage from both her groin and knee incisions culture positive for *Escherichia coli*.

Fig 1. After amputation of 5th toe and excision of femoral popliteal graft, the patient in case 1 had progressive ischemia of her foot.

The patient was transferred to our institution on postoperative day 11 and at that time remained critically ill, with respiratory failure and renal failure mandating dialysis. In addition, she had signs of sepsis from a prosthetic graft infection.

After appropriate antibiotic therapy with Zosyn (piperacillin/tazobactam; Wyeth, Madison, NJ), the patient was medically optimized and underwent graft excision with vein patching of the common femoral and popliteal arteries. Gross purulence of the graft and was identified, and intraoperative cultures also grew *E coli*. Open amputation of her gangrenous toe was also performed. No attempt at operative revascularization was made because of her poor clinical condition and limited autogenous conduit.

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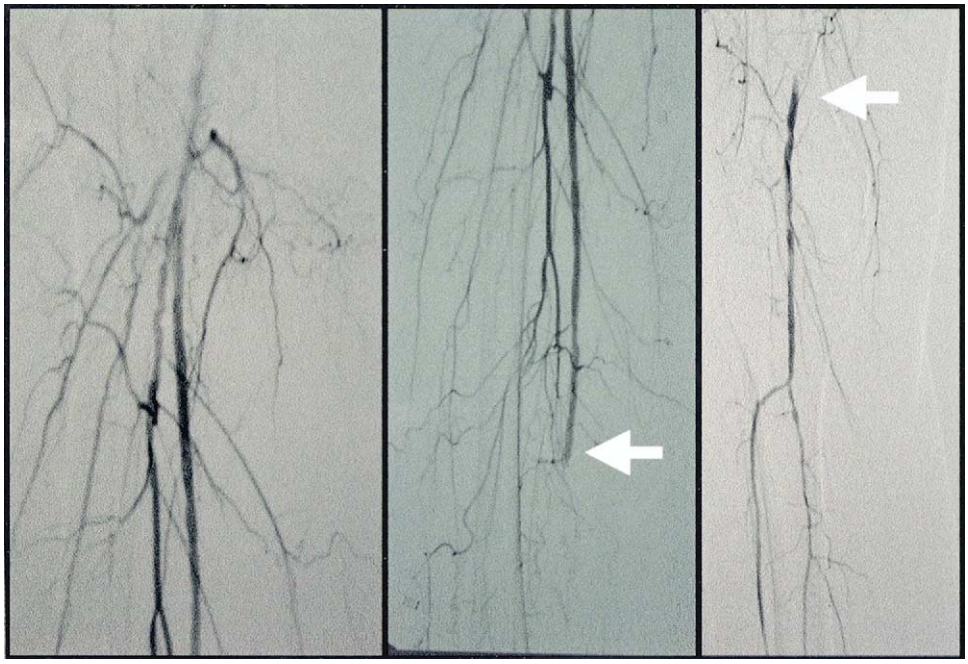

Fig 2. Angiogram before superficial femoral artery (SFA) recanalization in case 2. *Arrows* designate SFA occlusion and popliteal reconstitution.

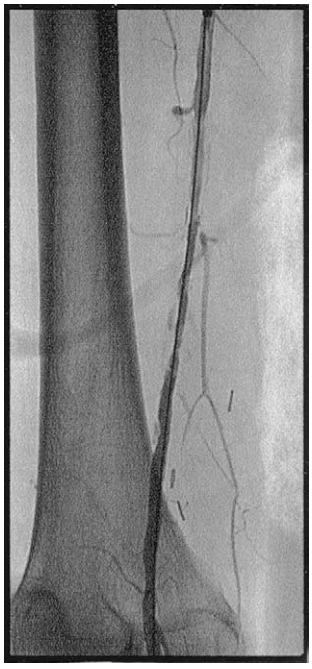

Fig 3. Completion angiogram after successful subintimal angioplasty of SFA occlusion in case 1.

The patient's limb remained marginally viable with progression of ischemia at the amputation margins (Fig 1). Eight days after excision of her graft a decision was made to attempt endovascular recanalization of her native vessels.

Initial angiogram showed superficial femoral artery occlusion with popliteal reconstitution and two-vessel runoff (Fig 2). After placing a long sheath up and over the aortic bifurcation from a contralateral retrograde approach, the superficial femoral artery was recanalized by passing a stiff guidewire (Boston Scientific, Natick, Mass) in a subintimal plane into the popliteal. After confirming re-entry into the popliteal, the superficial femoral artery was dilated throughout its length with a 5 mm by 10 cm balloon (Fig 3).

Postprocedure ankle/brachial index (ABI) rose from .3 to .9 and remained so 3 months after the procedure. She underwent a total of 8 weeks of antibiotics and had a slow recovery with a prolonged rehabilitation. The patient's progressive ischemia was reversed, and she continued to have slow improvement in her open foot wounds at 3 months.

CASE 2.

A 73-year-old heavy tobacco abuser with metastatic small cell cancer of the lung was transferred from an outside hospital for bilateral lower extremity acute critical ischemia of approximately 6-hour duration. Physical examination showed all lower extremity pulses to be absent with no pedal Doppler signals. Computed tomography scan from the outside institution (Fig 4) was consistent with aortic occlusion.

The patient underwent emergent axillobifemoral bypass with polytetrafluoroethylene. After this initial surgery the patient's critical ischemia was resolved; her ABIs were .75 on the left and waveforms only on the right. Her