Reconstruction with the use of autologous femoropopliteal veins for an infected aortobifemoral bypass graft

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DESCRIPTION

A 70-year-old man presented with left groin swelling 8 weeks after an aortobifemoral bypass graft (Dacron). The indication for an aortobifemoral bypass graft was a worsening short-distance claudication owing to an occluded aorta, right common iliac and left external iliac arteries (figure 1). His medical history included type 2 diabetes, hypertension, chronic obstructive pulmonary disease and atrial fibrillation. The patient was a non-smoker with alcohol consumption allowance below 21 units/week.

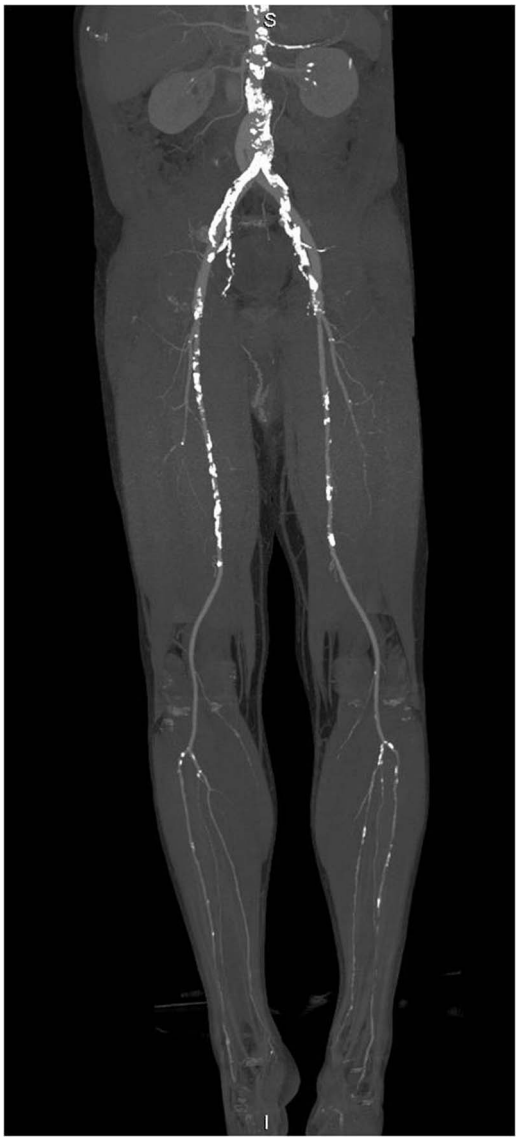

Figure 1 CT angiography showing an aortoiliac disease.

Upon examination, the patient had a temperature of 38.4°C and a heart rate of 109/min. Blood pressure and oxygen saturation were normal. Examination of respiratory system was unremarkable. Heart sounds were normal with no murmurs. Abdomen was soft and non-tender with healed scars. A detailed peripheral vascular examination demonstrated the left groin swelling with transmitted pulsation, which was not expansile. There was no tissue loss and pedal pulses were present bilaterally.

The patient was admitted, and an emergency ultrasound scan (US) of the left groin was performed to rule out the presence of pseudoaneurysm. The US showed reactive lymph nodes in the groin and heterogeneous collection (1.8×2.1 cm) superiorly to the graft with no obvious flow within the collection. Subsequently, a CT angiography confirmed an isolated left groin collection (figure 2). Laboratory tests showed elevated white cell count (WBC) of 14×10 g/l and C reactive protein (CRP) of 102 mg/l. The remaining biochemical markers including liver function tests, amylase, urea and electrolytes and haemoglobin were within the normal range. A full septic screen was done including three sets of blood cultures, which were found to be negative after 48 h of incubation. A chest radiograph and midstream specimen of urine revealed no abnormalities. An aspiration of the left groin was deemed to be an unsafe option owing to the close proximity between the graft and collection. Therefore, following fluid resuscitation, high-dose broad-spectrum antibiotics were administered for the presumed prosthetic graft infection. The antibiotics included intravenous vancomycin 1 g daily with tazocin 4.5 g three times a day and oral doxycycline 200 mg daily along with rifampicin 600 mg twice daily and were

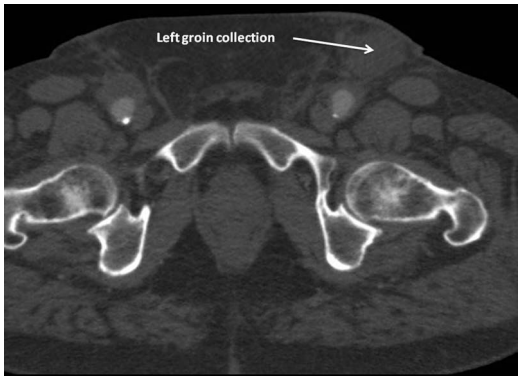

Figure 2 CT angiography demonstrating an isolated left groin swelling superior to the prosthetic graft.

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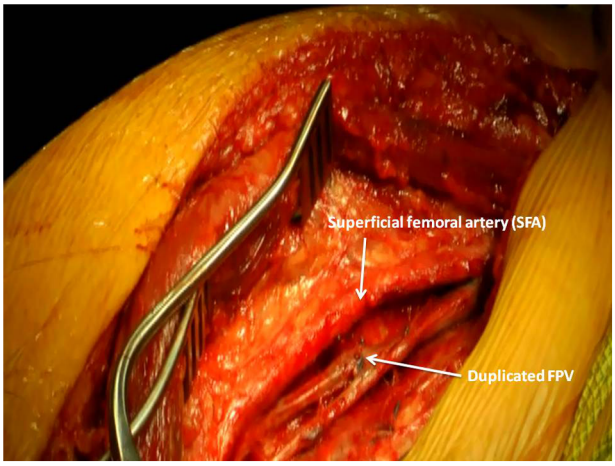

Figure 3 Right duplicated femoropopliteal vein harvest.

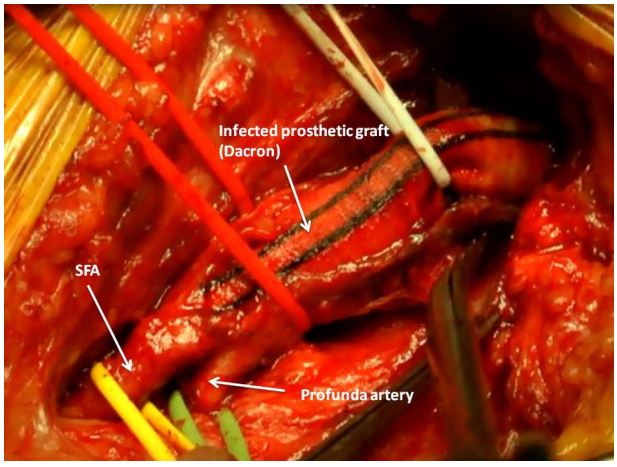

Figure 5 Dissected distal (groin) portion of the aortobifemoral bypass graft.

administered for 5 days preoperatively. In spite of that the patient continued to be febrile with rising levels of WBC and CRP. Therefore, after the discussion at the vascular multidisciplinary team meeting, it was decided that an excision of an infected aortobifemoral bypass graft with autologous veins reconstruction was the only feasible treatment option. Unfortunately, vein mapping of both lower and upper limbs revealed no suitable superficial veins. However, femoropopliteal veins (FPV) were found to be patent and with suitable diameters as venous conduits (8.2–9.9 mm diameters).

Subsequently, the patient underwent an explantation of an infected aortobifemoral bypass graft followed by an arterial reconstruction with bilateral FPV. Both FPV were harvested simultaneously by separate surgical teams from its origins to the adductor hiatus (figure 3). The third surgical team removed an infected aortobifemoral bypass graft and performed an aortobifemoral reconstruction (figures 4 and 5). This consisted of a proximal end-to-end aorto-FPV anastomosis (figure 6) and right distal end-to-side FPV-common femoral artery (CFA) anastomosis. Second FPV was anastomosed as an end-to-side anastomosis proximally onto the FPV (figure 7) and distally as an end-to-side anastomosis onto the left CFA. During the operation, a purulent fluid was discovered around the intra-abdominal portion of the graft as well as in the contralateral groin. The fluid was sent for a culture and sensitivity, but did not grow any pathogens. Postoperatively, the patient completed a 2 weeks course of broad-spectrum antibiotics and overall made an uneventful recovery.

Routine graft surveillance scans showed a normal aorto-FPV anastomosis and static 50% stenosis at the junction of the end-to-side FPV–FPV anastomosis with patent both limbs of the graft. Upon a routine follow-up appointment the patient reported no claudication and minimal lower limbs' swelling.

Graft infections following aortic reconstructions represent one of the most challenging conditions that vascular surgeons may deal with. The incidence varies from 0.7% to 2% and can be associated with a significant mortality of 25%.[1 2] The core surgical principles advocate removal of an infected prosthetic material, meticulous debridement, prolonged antibiotic therapy followed by vascular reconstruction.[1] The traditional treatment involves an infected graft excision followed by an extra-anatomical or in situ bypass using an antibiotic-bonded prosthetic graft.[3–5] However, this approach is associated with high-reinfection rate (up to 25%), aortic stump 'blow out', graft failures (35%) and mortality of up to 30%.[1 2] Also, the long-term results remain unknown.[2 6] Another compelling alternative is the use of an autologous FPV as an arterial conduit in treatment of infected aortic grafts. FPV has been successfully used for many years as a form of reconstruction following various infra-inguinal prosthetic graft infections.[5 7] Furthermore, some reported superior results with FPV use as a primary conduit for femoropopliteal bypasses.[8–10]

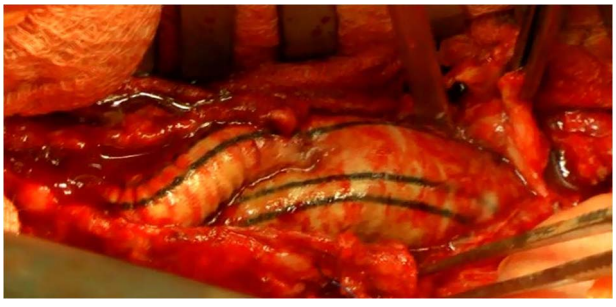

Figure 4 Dissected intra-abdominal portion of the aortobifemoral bypass graft.

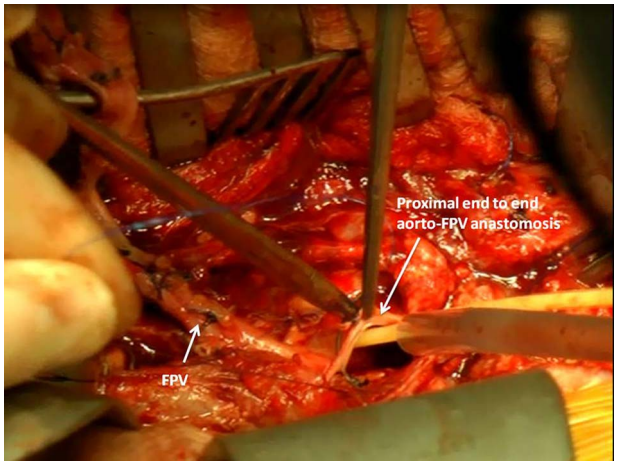

Figure 6 Proximal end-to-end aortofemoropopliteal vein anastomosis.

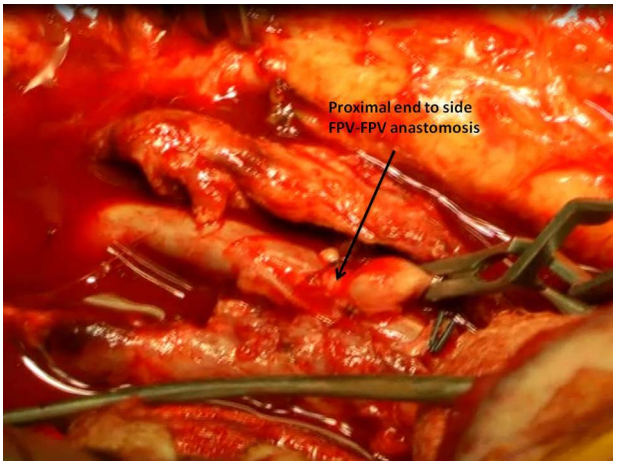

Figure 7 Proximal end-to-side femoropopliteal vein–femoropopliteal vein anastomosis.

Aortic reconstruction with FPV has many advantages. First, it allows for the restoration of an anatomical blood flow in the grossly contaminated area with high-patency rates.[1] Second, death rates have been found to be significantly reduced (4.3%).[1] Finally, FPV almost eliminated recurrent infection.[1] Despite that, there are some difficulties. One must remember that the length of the FPV available for harvesting is about 30–33 cm.[7] Consequently, both legs may require harvesting, which significantly prolongs the procedure. Also, the removal of the main venous trunks can lead to the chronic venous stasis.[10 11] However, clinically this rarely causes a significant problem and more importantly, patients seem to well-tolerate FPV excision.[1 2]

Overall, FPV should be considered is a conduit of choice for an aortic reconstruction when there is a high-risk of a prosthetic graft infection.

Learning points

- The initial treatment of an infected aortic prosthetic bypass graft should include broad-spectrum antibiotics therapy.
- If the conservative approach fails, an extensive debridement of infected tissue with removal of an infected prosthesis followed by an arterial reconstruction is performed.
- The arterial reconstruction involves an extra-anatomical or an in situ bypass using an antibiotic-bonded prosthetic graft and an autologous femoropopliteal vein (FPV).
- FPV has been proved to produce satisfactory results and should be considered as a treatment of choice in the contaminated vascular fields.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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