



Technical Note

Harvesting of femoral veins for arterial reconstruction

Extracción de venas femorales para reconstrucción arterial

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INTRODUCTION

Currently, prosthetic and endoprosthetic infections remain a complex clinical situation impacted by various factors, making it difficult to estimate the actual incidence rate, which varies depending on the anatomical location and type of infection. In abdominal aortic repair surgery, the 2-year incidence rate ranges from 1.6 % to 4.5 % (1).

Some identified risk factors include long lengths of stay, urgency or emergency surgeries, inguinal incisions, extended surgical time, graft thrombosis, superficial skin infections in the incision area, immunosuppression, diabetes, and chronic kidney disease (1).

Regarding etiopathogenesis, it is presumed that early infections are mostly caused by intraoperative sterility defects, while late infections result from hematological seeding in the prosthetic material from respiratory or urinary tract infections (1).

When prosthetic or endoprosthetic infection is suspected, a comprehensive clinical, microbiological, and radiological evaluation should be conducted based on the MAGIC criteria (2). Despite the rarity

involved in this condition, a multidisciplinary treatment strategy is advised in the presence of this entity including proper antimicrobial management and, in many cases, complete removal of the infected prosthetic material to prevent complications such as sepsis, graft thrombosis, fistulas to the genitourinary or digestive system, and even death.

Material explantation includes arterial reconstruction with the best available material, which, according to recent recommendations, is autologous material (1).

In our center, when necessary, the first choice for arterial reconstruction in the presence of an infection is superficial femoral veins. The purpose of this technical note is to describe the extraction technique and its subsequent preparation for use as an autologous graft.

INDICATIONS AND CONTRAINDICATIONS

The indication for using this technique includes patients been diagnosed with vascular prosthetic or endoprosthetic infection, and who should be eligible for open surgery.

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Contraindications include prior venous thrombosis and patients in emergency situations (3).

DESCRIPTION

Preoperatively, a bilateral ultrasound evaluation of the lower limb deep venous system is performed to assess the size and characteristics of the veins, and detect changes suggestive of recanalization, or thrombosis. Typically, the femoral vein has a diameter between 6 mm and 12 mm and a useful length of nearly 40 cm to 50 cm. In about 25 % of the cases, the femoral vein is double.

Femoral vein extraction (both unilateral and bilateral) often allows for aortoiliac revascularization in an anatomical position.

When aortoiliac revascularization is necessary, a composite graft is needed, which in our center is often a tubularized bovine pericardium xenograft, along with femoral veins in a bifurcated configuration.

After opening the muscle fascia, the sartorius muscle is retracted medially to access the vasculonervous bundle. The vein is, then, dissected, starting from the confluence of the common femoral vein and deep femoral vein, from its origin downwards. Afterwards, collateral branches are ligated with surgical clips or silk ligatures.

Once all branches have been ligated, and the vein has been freed along its entire length, it is sectioned at its proximal (right at its origin, underneath the deep femoral vein, leaving no stump) and distal ends (depending on the required length but always right above a patent collateral; it is often cut at Hunter's canal level). This ensures venous drainage through the popliteal and deep femoral veins. Afterwards, valvulotomy or vein inversion is performed. We should mention that in our center, we always use inverted femoral veins for grafting (Fig. 2).

Before starting the abdominal procedure, incisions are closed with aspiration drainage, and an intermittent pneumatic compression system is used for the remainder of the surgical act and immediate postoperative period.

TECHNICAL PROCEDURE

While the patient is in the supine position, a longitudinal incision is performed on the lateral edge of the sartorius muscle, depending on the length that would be required (3,4) (Fig. 1).



Figure 1. Position of the patient during dissection for extraction.

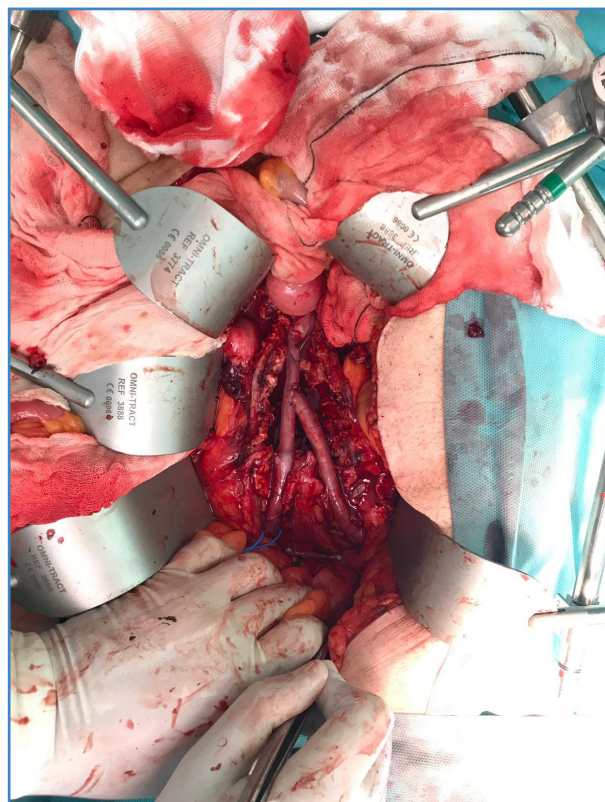


Figure 2. Aortoiliac reconstruction with a Y-shaped configuration.

Two surgical teams are involved in the entire process, one for each leg, and the procedure often takes less than 90 min.

Regarding aortic arterial reconstruction, proximal anastomosis can be performed in various ways, being end-to-end anastomosis the most common one. If a larger vein diameter is needed, the diameter can be increased by performing a V-plasty, or else,



Figure 3. Creation of the V-plasty with the superficial femoral vein.

a diagonal suture can be performed in the aorta to reduce its diameter (Figs. 3 and 4).

In the postoperative period, the use of pneumatic compression stockings and therapeutic low molecular weight heparin for, at least, 3 months is advised. Compression therapy should be continued indefinitely. Anticoagulants can be discontinued, with each decision being made on a case-by-case basis.

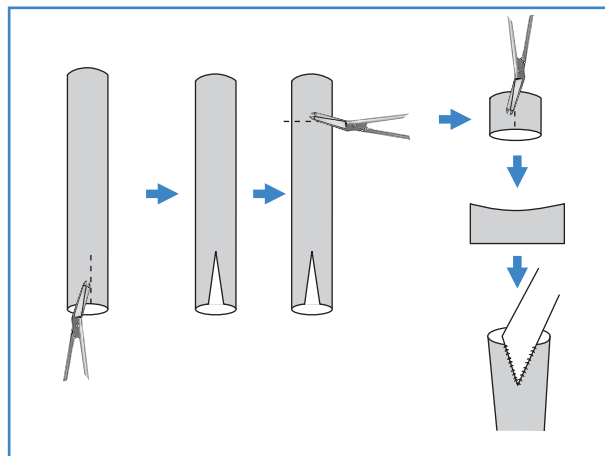


Figure 4. Illustration of vein preparation.

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