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Inversion technique for explantation of prosthetic vascular grafts

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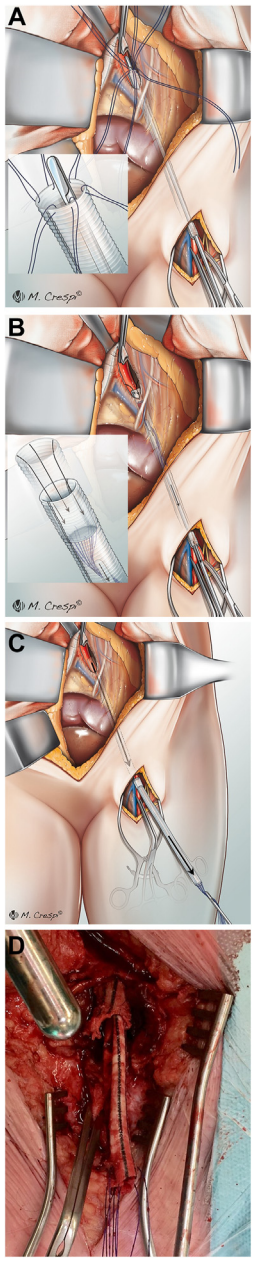
Prosthetic grafts can be used to treat vascular disease in the aortoiliac–femoral axis. A rare complication is infection of the graft, occurring in 1% to 6% of cases and reported to have high rates of mortality and limb amputation.[1-3] Explantation of the graft and subsequent reconstruction is usually indicated.[4]

Grafts that are not adherent to the surrounding tissues (ie, in the case of severe infection) can be easily removed by simply pulling out the graft. Removing well-incorporated prosthetic bypass grafts, however, can be challenging, especially in the case of an aortic bifurcation graft with infection limited to the aortic part where the limbs are still well incorporated into the surrounding tissues. Removing a very well-incorporated graft will either damage the surrounding tissues or tear the graft. Meticulous dissection along the graft can also result in damage to the surrounding tissues such as the bowel, ureter, or deep vein.

Because of the difficulties explanting the unaffected graft limbs, partial resection limited to the aortic part can be considered. However, if the limb is left in situ and connected to the new graft, a risk of infection in the new graft exists. Ideally, the entire graft should be explanted.[5]

We present a novel technique for complete explantation of well-adhered (portions of) vascular grafts that are otherwise difficult to reach by meticulous dissection without damaging surrounding tissues. The patient provided written informed consent.

First, the limb of the bifemoral graft is disengaged from the aortic part and the femoral artery. Subsequently, six individual monofilament 4-0 sutures are secured to the proximal end of the limb (*A*). A long vascular tunneling grasping forceps is then inserted into the graft from the distal end, and the suture threads are pulled through the graft (*B*). Manual traction is applied to the threads. This will first invert the graft, beginning at the suture line. Next, by maintaining traction, the graft can be removed outside-in (*C* and *D*/Cover and Supplementary Video, online only). A minimum of six sutures are recommended to ensure adequate inversion of the graft material. This technique is not limited to aorto-bifemoral grafts and can also be applied to remove grafts in other locations, such as femoropopliteal and crossover grafts.



REFERENCES

1. Seeger JM. Management of patients with prosthetic vascular graft infection. Am Surg 2000;66:166-77.
2. Piano G. Infections in lower extremity vascular grafts. Surg Clin North Am 1995;75:799-809.
3. Oderich GS, Panneton JM. Aortic graft infection. What have we learned during the last decades? Acta Chir Belg 2002;102:7-13.
4. Saleem BR, Meerwaldt R, Tielliu IF, Verhoeven EL, van den Dungen JJ, Zeebregts CJ. Conservative treatment of vascular prosthetic graft infection is associated with high mortality. Am J Surg 2010;200:47-52.
5. Bunt TJ. Vascular graft infections: an update. Cardiovasc Surg 2001;9:225-33.

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