Eur J Vasc Endovasc Surg **21**, 274–275 (2001)
doi:10.1053/ejvs.2000.1265, available online at http://www.idealibrary.com on IDEAL®

TECHNICAL REPORT

Management of Aneurysmal Arteriovenous Fistula by a Perivascular Metal Mesh

O. Grauhan*, H. R. Zurbrügg and R. Hetzer

Department of Cardiothoracic and Vascular Surgery, Deutsches Herzzentrum Berlin, Germany

Introduction

The management of shunt complications can pose challenging problems. The aim of a shunt revision should be the long-term re-establishment of a vascular access without resection, i.e. loss of a vascular segment. From this aspect, the presented biocompound-graft technique appears to be a sound procedure for the management of aneurysmal dilatation of the vein of AV fistulae.

Technical Report

Six years after heart transplantation a 56-year-old patient with renal insufficiency required a Cimino fistula in the right forearm. Three-and-a-half years later a rapidly growing venous aneurysm of the fistula required surgical revision.

The skin incision was made along the whole length of the aneurysmal vein (Fig 1a). The arteriovenous anastomosis was separated and the venous aneurysm incised longitudinally. Using a 7 mm Hegar's dilator, a venous tube was created by oversewing the aneurysmal wall with running 6-0 Prolene sutures. The venous tube was then inserted into an highly flexible metal mesh tube, and the two joined with fibrin glue.[1] Finally, the arteriovenous anastomosis was re-established (Fig 1b). The braided metal mesh tubing was made of stainless steel with 48 wires of 36 micron

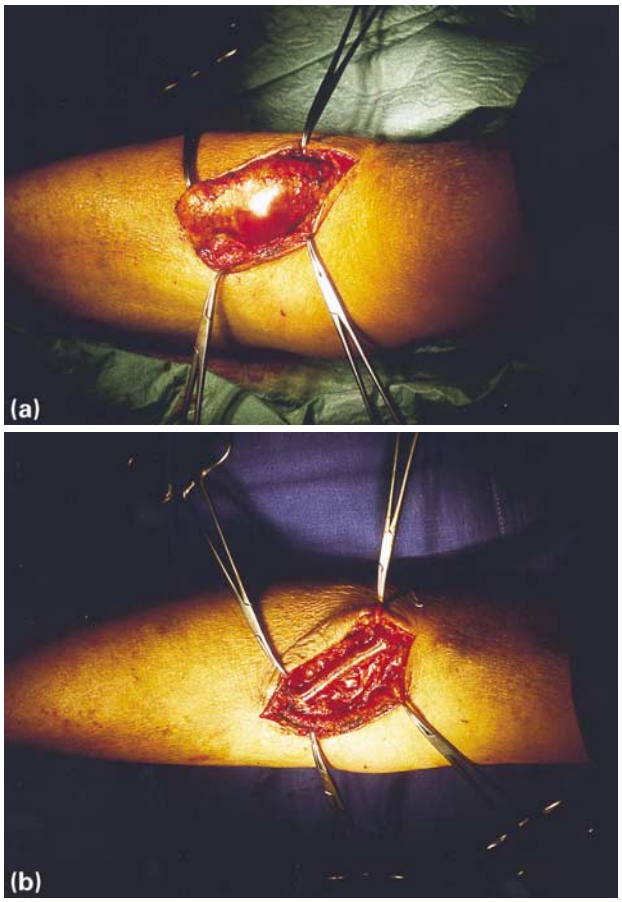

Fig. 1. (a) The venous aneurysm has rapidly developed 3.5 years after the installation of an arteriovenous fistula for haemodialysis. (b) The biocompound-graft consists of a venous tube from the aneurysmatic wall wrapped with an ultraflexible metal mesh.

* Please address all correspondence to: O. Grauhan, Department of Cardiothoracic and Vascular Surgery, Deutsches Herzzentrum Berlin, Augustenburger Platz 1, 13353 Berlin, Germany.

1078–5884/01/030274+02 $35.00/0

diameter, i.e. much finer and more flexible than a conventional endovascular stent.

The new mesh-reinforced vein was successfully reused for dialysis within 6 weeks of the operation. Since then the patient has had no complications, and duplex revealed a shunt flow of 1000 ml/min 15 months postoperatively with no evidence of aneurysmal dilatation.

Discussion

Aneurysmal dilatation of the vein occurs in 5–10% of arteriovenous fistulas after access surgery for haemodialysis. An aneurysmal fistula can continue to provide excellent haemodialysis access for many years, but erosion of the covering skin and progressive growth expansion are regarded as indications for surgical correction.[2,3]

The traditional therapy is resection of the aneurysmal segment. Since angio-access is literally the lifeline in haemodialysis patients, we believe that loss of vascular segments should be avoided if possible. Aneurysmal arteriovenous fistulae have been treated by lateral venorrhaphy with sutures or even a stapler device.[4] However, although wall tension may be reduced, the wall itself remains weakened.

Vascular access using a prosthetic graft is associated with an increased risk of complications. Since the vascular endothelium, as well as the vascular wall texture, remain preserved with this technique, we expect little risk of thrombosis and the metal mesh should prevent further aneurysmal dilatation. Nevertheless, the metal mesh represents foreign matter, which increases the risk of infection. However, in this case no infection occurred during the long-term use of the fistula, despite triple-drug immunosuppression after heart transplantation. Moreover, it is known from aortocoronary bypass surgery that a proven infection of this type of hybrid vascular prosthesis can heal without explantation of the graft.[1] This may be explained by the small amount of foreign material, compared to a prosthetic graft.

We believe that this technique, using mesh-reinforced vein, is a safe and effective procedure to preserve vascular access for dialysis when dealing with aneurysmal arteriovenous fistulae.

References

1 Zurbrügg HR, Wied M, Hetzer R. Complete revascularization with the biocompound-graft procedure in patients with varicose veins. *Arch Chir Thorac Cardiovasc* 1997; **19**: 314–320.
2 Schanzer H, Skladany M. Vascular access for dialysis. In: Haimovici H, ed. *Vascular Surgery.* 4th ed. Cambridge: Blackwell Sciences; 1996: p. 1028–1041.
3 Wahl W, Bredel J, Wandel E *et al.* Surgical management of dysfunctions of dialysis fistulas. *Langenbecks Arch Chir* 1997; **382**: 237–242.
4 Hakim NS, Romagnoli J, Contis JC, Akoh J, Papalois VE. Refashioning of an aneurysmatic arterio-venous fistula by using the multifire GIA 60 surgical stapler. *Int Surg* 1997; **82**: 376–377.

Accepted 18 November 2000