

Abstracts from Angio Access for Hemodialysis

between the distal radial artery and the elbow vein, or transposition of the radial artery (Bourquelot et al. *J Vasc Surg* 2009) avoid the risks of secondary stenosis of the venous anastomosis of grafts.

A similar algorithm applies for distal AVF which are less frequently complicated by distal ischaemia. Low flow non-matured AVF must be ligated. Normal flow AVF should be treated by distal radial artery ligation. High flow AVF-related ischaemia (above 800 ml/min) is best treated by juxta-anastomosis proximal radial artery ligation (PRAL) which is an easy and effective technique for reduction of distal AVF (Bourquelot et al. *Eur J Vasc Endovasc Surg* in press).

10 CEPHALIC ARCH STENOSIS. CONSERVATIVE SURGERY OR CREATION OF A NEW VASCULAR ACCESS?

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Cephalic arch stenosis (CAS) is the major reason why brachial cephalic AVFs so frequently malfunction (up to 39%). The stenosis may be partly due to compression of the dilated vein as it passes through the clavicular fascia, just before its junction with the axillary vein. Turbulent high flow, frequently associated with elbow AVF, may reinforce the stenosis by inducing hyperplasia of the intima and valves in the upper part of the vein.

In view of the rather disappointing results of percutaneous angioplasty for CAS (early recurrence after PTA, risk of subclavian vein stenosis after stenting) surgery must be considered for certain patients.

Re-routing the vein is a surgical option. The upper part of the cephalic vein is freed as proximally as possible to ensure adequate length. A second incision in the axilla exposes the axillary vein. The cephalic vein is then transposed through a subcutaneous tunnel and anastomosed end-to-side to the upper basilic ⁄ axillary vein. We have performed this technique successfully in a few cases. In 2005 Chen reported 9 patients with a median fistula age of 14 months. Primary patency rates after surgery were 70% at 6 months and 60% at 12 months, compared to the primary patency rates (42% at 6 months and 23% at 12 months) reported by Rajan in 2003 after percutaneous balloon angioplasty in 26 fistulas. Although stenosis may reappear at the site of re-anastomosis, this is far from frequent according to Chen. It is important to note that this transposition procedure may jeopardize the creation of a basilic vein fistula in the future.

Creation of a new vascular arteriovenous access in the opposite limb, if feasible, might be a better option when CAS is associated with very high flow AVF, or high grade aneurysmal degeneration of the vein, especially in younger patients.

In conclusion, besides percutaneous treatments, surgical re-routing and creation of a new access must be considered when treating CAS.

11 SUPERFICIALIZATION OF FOREARM VEINS: LIPECTOMY

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Background: Tunnelled transposition is the traditional technique for superficialization of the distal cephalic vein in obese patients. Lipectomy is a new technique (*J Vasc Surg* 2009) that removes subcutaneous fat without mobilization of the vein.

Methods: This single-centre prospective study included 49 consecutive patients (17 men, 32 women) who underwent second-stage lipectomy after creation of a radial-cephalic fistula. Mean patient age was 54 years, 36% had diabetes, and mean body mass index was 31 ± 5.6 kg/m². Subcutaneous fatty tissues were removed after two transverse skin incisions under regional anaesthesia and preventive hemostasis. Cannulation was first allowed 1 month later, after clinical and colour duplex ultrasound evaluation. Technical success was defined as the ability to remove the fat and to palpate the patent vein immediately under the skin at the end of the operation. Clinical success was defined as the ability to perform at least three consecutive dialysis sessions with two needles. All patients were checked systematically every 6 months by the surgeon.

Results: Technical and clinical success rates were 96% (47 of 49) and 94% (46 of 49), respectively. Mean vein depth decreased from 8 ± 2 to 3 ± 1 mm according to duplex ultrasound imaging. The mean vein diameter increased from 6 ± 1 to 8 ± 2 mm. In one patient, vein tortuosity that was overlooked required conventional repeat tunnelling. One extensive haematoma resulted in loss of the fistula. One patient died before the fistula could be used. Primary patency rates were $71\% \pm 7\%$ and $63\% \pm 8\%$ at 1 and 3 years, respectively, and secondary patency rates were $98\% \pm 2\%$ and $88\% \pm 7\%$. Delayed complications were treated by surgery (N = 7) or by endovascular procedures (N = 10).

Conclusion: Lipectomy is a safe, effective, and durable approach to make deep arterialized forearm cephalic veins accessible for routine cannulation for hemodialysis in obese patients who often have distal veins that have been preserved by their fat from previous attempts at cannulation for blood sampling or infusion.

12 TOPICAL ELASTASE INCREASES AVG OUTFLOW VEIN DIAMETER AND LUMEN AREA IN A SWINE MODEL

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Aims/Introduction: PRT-201 is a recombinant human pancreatic elastase under development as a treatment to improve AVF maturation and prolong AVF patency. The objectives of this study were to determine the effect of PRT-201 on AVG outflow vein diameter, blood flow, patency, venous neointimal hyperplasia, and wound healing.

Methods: Twenty-three 6 mm x 10 cm ePTFE grafts were interposed between the femoral arteries and veins of 12 juvenile Yorkshire swine. The outflow vein was treated topically with either saline (n=6) or saline containing PRT-201 1.0 mg (n=4), 1.5 mg (n=5), 3.0 mg (n=5) or 4.5 mg (n=3) over 10 minutes. Digital photographic images and blood flow (Transonic) were obtained pre- and post-treatment. Twenty-one days later, angiography was performed to determine graft and vein patency and vein lumen diameter then the AVG was exposed and graft blood flow was measured. Finally, the animals were euthanized and the AVGs and veins were fixed with formalin.

Results: Similar responses for several vein measurements were noted among the PRT-201 dose groups and thus the PRT-201 groups were combined for analysis. PRT-201 resulted in an acute non-dose dependent increase in the outer vein diameter compared with saline ($19 \pm 13\%$ vs. $6 \pm 8\%$, $p < 0.05$). At 21 days, PRT-201 was associated with greater vein patency (76% vs. 33%), graft blood flow, and vein lumen diameter. Histomorphometric outer vein and lumen diameter and area were greater with PRT-201 whereas neointima area, medial area, neointima thickness, and neointima/lumen area ratio were similar. PRT-201 at all doses caused notable dissolution of the external elastic lamina that was limited to the application site. Other histopathological measures of vein tissue response were not affected by PRT-201. PRT-201 had no adverse effect on wound healing grossly or microscopically.

Conclusion: PRT-201 treatment of the AVG outflow vein immediately following placement was both safe and effective at increasing outer vein and vein lumen diameter and area in swine. An ongoing clinical trial is evaluating the effect of PRT-201 on outflow vein diameter and blood flow in CKD patients undergoing AVG placement.

13 DEADLOCK IN HEMODIALYSIS ANGIOACCESS (DHDA): REFLECTIONS ABOUT 15 OBSERVATIONS

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The authors reported observations of deadlock in hemodialysis angioaccess (DHDA) of 15 patients (9 F & 6 M) with mean age at 59 ± 18 years,