Long-Term Preservation of Homologous Saphenous Veins for Vascular Access in Hemodialysis by Deep-Freezing

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Dear Sir,

Autologous saphenous veins are largely employed in cardiac and vascular surgery; in dialysis patients, their use, often after many attempts at access have failed, gives results that are comparable or better than those obtained with plastic prostheses [2,4]. Nevertheless, on many occasions, recourse to a venous homograft becomes necessary: e.g. previous saphenectomy or phlebitis, inadequate caliber of the autogenous saphenous vein, necessity of reducing the dose of local anesthesia and the duration of operation especially in elderly and high-risk patients. The clinical application of homologous saphenous veins is favorable in our and other authors' experience [1,3]. In order always to have suitable venous homo-grafts available, we have developed a technique of long-term preservation of saphenous veins, based on deepfreezing, thus creating a bank of veins for transplantation. The greater saphenous vein is obtained from routine operations of saphenectomy, performed in different surgical centers; the donor patients are previously investigated for lues, TB, sepsis, HBsAg, HIV and tumors. The removed vein is flushed with saline solution, added with antibiotics; then it is prepared by ligating collaterals and suturing fissurations. The part chosen is generally the one above the knee and should be 20–30 cm long, with a diameter of 0.5–1.2 cm, whereas the fibrotic, thrombosed or largely dilatated segments are discarded. The vein, without folding, wrapped in a sterile aluminium sheet, is immersed in liquid nitrogen at a temperature of -196 °C. After 6 months of storage, before starting clinical application, the freeze-preserved veins are subjected to laboratory tests. Their mechanical properties are examined with a peristaltic pump, demonstrating a prolonged resistance to pressures above 120 mm Hg. No histological changes were observed in comparison with fresh veins. Histo-chemical study, with the technique of immunoperoxi-dase, showed normal binding of Ulex europaeus I lectin and of factor VIII, demonstrating persistent antigenity and good preservation of endothelium. Our clinical experience is limited to 6 cases (2 men and 4 women) aged 59–81 years. After failure of many arteriovenous fistula sites, they received a long-term preserved saphenous vein homograft, which was implanted reversely in the arm or thigh, constructing arteriovenous straight-line or loop bypasses in brachiocephalic or femorofemoral

position. The surgical procedure, always performed with local anesthesia, was easy, and venipuncture of the implanted homograft was performed after 20 days without any particular problems. All our implanted homografts, after a follow-up of 6 months, are well functioning and easily utilized for periodic hemodialysis, demonstrating a high patency, no infection and absolute absence of clinical signs of rejection. In our opinion, the long-term preserved venous homografts can be considered to be of great utility for their ready availability, preparation, storage, ease of handling during surgery, and low price; therefore the creation of a bank of freeze-preserved venous homografts must be encouraged in nephrological and vascular departments.

References

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