Surgical Treatment of Deep Venous Reflux

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Introduction

Surgery for deep venous reflux has been regarded with considerable scepticism by many vascular surgeons because it is thought to bear a high risk for deep venous thrombosis (DVT) and because of an uncertain long term outcome. Recent publications by different authors have proved that surgery for deep venous reflux, done by experienced vascular surgeons in this field, is safe and the long term results are better than expected.1-3

Due to easier access and the preoperative use of the duplex-scan in patients presenting with varicose veins, we are increasingly confronted with the diagnosis of an unexpected deep venous reflux. The significance, however, of proven reflux has to be determined for each patient individually. Reflux is the most important but not the only pathological feature of deep venous incompetence of the lower limb.1,4 The aim of surgery is to improve upon the result that can be achieved without surgery. The intention is to improve the venous function in order to allow the patient to lead a life without pain, swelling, ulceration and, in the ideal case, free of external compression.2

The main problem we face is chronic venous hypertension within the deep system caused by reflux alone or in combination with deep venous outlet obstruction. Incompetent communicating veins and an insufficient calf muscle pump put an additional load on the deep veins when standing. Where superficial, communicating and deep vein incompetence coexist, all abnormalities should be corrected.4 The different operations should be done sequentially and not together. Deep venous valve reconstruction is only successful in a therapeutic concept, that is based on a thorough diagnosis of all the structural and functional abnormalities present in the affected limb.5 Nowadays the new CEAP classification5 (Clinical signs, Etiology, Anatomic distribution and Pathophysiologic classification) of chronic venous disorders allows exact, easy and reproducible description of the venous status. A complete evaluation of all venous systems from groin to ankle is necessary before any surgery is done.

Diagnostic Work-up and Operating Procedures

The diagnostic work-up begins with the clinical status and a hand-held Doppler screening examination. The following duplex scan detects obstruction and/or reflux in each venous segment of the superficial and deep venous system.

For simple varicose veins the first surgical step consists of conventional saphenous ligation and stripping as well as ligation of insufficient perforator veins. Any coexisting venous outflow obstruction must be corrected prior to surgical therapy for deep venous reflux. In nine limbs with primary, four limbs with post thrombotic and two limbs with combined valvular incompetence, we initially treated (sometimes recurrent) superficial varicose veins, including perforator ligation 21 times. One stent of an iliac vein and two femorofemoral crossover bypasses also had to be done to correct outflow obstruction prior to deep valve reconstruction. Walsh et al.6 reported abolition of femoral venous reflux after greater saphenous stripping. This adheres to our concept of valve reconstruction only after all the other above mentioned interventions. We do not limit deep venous valvular

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reconstruction to patients with stage C₃ and C₅ (former stage III) disease.

In case of a persistent reflux from groin to calf despite previous interventions the indication for surgical valve reconstruction or transplantation is given. We must be able to distinguish between primary, secondary or combined (e.g. post-thrombotic destroyed valves at the popliteal level and below and primary incompetence in the superficial femoral vein) valvular incompetence to plan the valve reconstruction, since the surgical methods for reconstruction differ. Only an ascending and descending phlebogram shows us accurately the site of the incompetent valves in the deep venous system.

In patients with primary valvular incompetence valvuloplasty is our treatment of choice. We prefer the external tightening of the vein wall to the open, direct valve repair. Our usual site of correction is the proximal superficial femoral vein. We recommend the reconstruction of two valves. In patients with post-thrombotic destroyed valves, vein valve transplantation is the only viable method. The valve-bearing segment is harvested either from the contralateral femoral or long saphenous vein or from the axillary vein, depending on the anatomic status. In the former case, the femoral vein is not ligated but the defect in the contralateral femoral vein is repaired with the valveless segment that was removed from the other leg. For implantation we choose the above-knee popliteal vein for better size match to the transplanted vein segment as described by O’Donell. To prevent progressive dilation after operation and deterioration of valve function after both valvuloplasty and vein valve transplantation all the reconstructed vein segments are encircled with a thin non-resorbable synthetic net.

The complication that must be avoided is DVT. Therefore all our patients receive 5000 units heparin intravenously at operation. Postoperatively heparin therapy is continued according to the thrombin-time, until oral anticoagulation, started on the first postoperative day, achieves a therapeutic level. Oral anticoagulation in patients with post-thrombotic sequelae at admission is not discontinued for the valve reconstruction. In our series of operated patients, there have been no thrombotic systemic bleeding complications. One local haematoma required surgical intervention. Kistner et al. reported thrombosis in two of 81 operated patients, both probably due to compressive haematomas in the wound. Eriksson found only one postoperative venous thrombosis in 135 limbs after valvuloplasty. Heparin is considered to be necessary during surgery and in the early postoperative period by most authors but some do not anticoagulate their patients. Additionally patients are encouraged to wear compression stockings for 3 months in case of primary valve incompetence with stage C₃ disease. Patients with stage C₄ or higher are advised to continue that use, as prevention of ulcer recurrence is the principle goal of therapy.

Results

We have performed eight valvuloplasty procedures, one transposition of the superficial femoral vein to the profunda femoris vein and six valve transplantations, once from the contralateral long saphenous vein and once from the contralateral femoral vein to the superficial femoral vein, twice from the axillary to the superficial femoral vein and twice to the above-knee popliteal vein. All our patients are regularly followed-up in the vascular laboratory. Descending phlebograms or duplex-scans provide information about the result after 3 months, 1 year and then in yearly intervals. The results after 1 year showed 12 limbs with complete valve competence (80%) and one newly diagnosed profunda vein reflux. One case with severe post-thrombotic sequelae and transplantation to the popliteal vein, showed 20% persistent reflux after 2 years. Finally, one transplanted valve completely failed after 3 months for unknown reasons. Six patients had a history of, sometimes recurrent, ulcers. No ulcers recurred during the follow-up (2, 3, 4, 20, 21 and 26 months respectively).

A review of 171 venous valve reconstructions for primary valve incompetence in five different series showed 70–90% competent valves in the 2–4 year follow-up period, with about half not needing elastic support wear in the long term. Surgical therapy, including deep vein valve reconstruction may not lead to a complete reversal of the abnormal venous pressure, but the venous hypertension is reduced to a degree that usually causes no more than stage C₃ disease. The 10 year cumulative clinical success examined by Masuda and Kistner in limbs with primary valve insufficiency corrected by valve repair was clearly superior (73%) as opposed to those with post-thrombotic syndrome treated by either valve transposition or transplantation (43%).

Conclusion and Outlook

Many questions concerning surgical therapy for deep...
venous reflux remain unanswered, one being whether one reconstructed valve is enough or if it is necessary to reconstruct more valves and on which level — popliteal or femoral or both? Furthermore, the reasons why long term results for valve transplantation are much poorer than for valvuloplasty are not yet known. As the appropriate role of surgery for deep venous reflux is not yet defined, this kind of surgery should only be performed in centres with proven expertise.

References


