

## RELATIONSHIP BETWEEN DEEP VENOUS REFLUX AND VARICOSE VEINS

SESHADRI RAJU, M.D.

University of Mississippi Medical Center, 2500 North State  
Street Jackson, Mississippi 39216 (U.S.A.)

### INTRODUCTION

Liberal use of descending venography in patients presenting with symptomatic venous insufficiency has provided insights contrary to longheld beliefs. In 232 consecutive descending venograms, superficial (saphenous) venous reflux was found in isolation in less than 1% of cases. Combined superficial and deep venous reflux occurred in 29%, while deep valve reflux alone was identified in 71%. Thus the traditional classification of venous insufficiency into separate superficial and deep varieties appears to be erroneous. In addition, the findings suggest that surgical attention paid only to the superficial system is bound to result in recurrence. Perforator incompetence was identified in 73% of these symptomatic limbs by ascending venography.<sup>1</sup> However, perforator incompetence when present was shown by descending venography to be secondary to deep valve reflux in 97%. Only in 3% could pure or isolated perforator incompetence be inferred. The emphasis in the past on primary perforator incompetence as a major mechanism in venous insufficiency appears to be without basis. On descending venography, reflux was classified as single level/single system, single level/multiple system, or multi-level/multi-system involvement.<sup>2</sup> In 58% of patients, multi-valvular reflux at multiple levels was identified and was the most common pathology. Single level/single system reflux was

the least common pathology (16%) occurring in symptomatic patients. Multi-valvular or multiple level involvement appears to be generally necessary for generation of stasis symptoms. Some authors have suggested that reflux confined to the thigh is innocuous. We found a high incidence of stasis ulceration with attendant hemodynamic abnormalities of a significant nature in patients with the reflux confined to the thigh but with involvement of two or more venous systems (i.e., saphenous, profunda, or femoral veins). Utilizing descending venography as the gold standard, it was noted that photoplethysmography (PPG) was only moderately sensitive (76%) but had an unacceptably low specificity (37%). It has since been abandoned for routine use. In contrast, Doppler in experienced hands, had an outstanding sensitivity (92%) and acceptable specificity (73%), rendering it the ideal qualitative screening test. An important additional hemodynamic test that was performed on all patients considered for surgery was the arm/foot venous pressure differential and reactive hyperemia-induced foot venous pressure elevation.<sup>3</sup> These two pressure based techniques were easily accomplished at the time of ambulatory venous pressure measurement through the same needle stick. Together these techniques yielded a sensitivity of over 90% and a similar degree of specificity in detecting venous obstruction. The techniques were found to be superior to venography in assessing hemodynamic severity, the contribution of collaterals and for follow-up of patients undergoing venous bypass surgery. The techniques are particularly useful in eliminating those

patients with any degree of venous obstruction from consideration for valve reconstruction surgery. Valve reconstruction is contraindicated in the presence of hemodynamic obstruction. Misguided attempts at surgical valve repair can be expected to fail with persistence of symptoms generated by obstructive venous hypertension. While deep venous thrombosis can certainly lead to valve destruction and reflux, multiple valve reflux at multiple levels presupposes an extensive thrombotic process which invariably results in some degree of obstruction.<sup>4</sup> Since such patients have been eliminated by the hemodynamic techniques described above, our valve reconstruction experience has consisted predominantly of primary or cryptogenic valve reflux. Amongst an experience now exceeding 200 valve reconstruction procedures, approximately 80% are estimated to be of nonthrombotic origin. The frequency with which this entity has been seen in our clinic has been surprising and very much higher than previously thought possible. At surgical exposure, the valve cusps were redundant with elongated edges that tend to prolapse and leak. The valve reconstruction technique through a transverse venotomy has previously been described.<sup>1</sup> In instances in which a valve repair fails or in which (rarely) the thrombotic process has destroyed the valve apparatus, an axillary vein valve transfer is performed. To prevent late dilatation of the transferred segment, a Dacron sleeve of appropriate size placed around the transferred segment is recommended.<sup>5</sup>

Patients considered for surgery should be selected carefully. Stasis ulceration is an excellent indication for surgery. In our clinic, this condition is present in the major proportion of patients undergoing valve reconstruction surgery. Pain alone or painful swelling are relative indications. Patients should be chosen based on age, work status, rehabilitation potential and emotional stability. Patients with chronic pain frequently are emotionally labile and pain may have become fixated as a functional manifestation. Such patients will not benefit from surgery.

With a minimum follow-up of two years and many extending up to 8 years, approximately 60% of patients undergoing valvuloplasty have had good to excellent results with relief of symptoms or complete healing of the stasis ulceration. Somewhat inferior results have been obtained with axillary vein transfer.<sup>1</sup> These results can be expected to improve with increasing experience and better selection process of choosing patients for surgery.

#### REFERENCES

1. Raju S, Fredericks R (1988) Valve reconstruction procedures for nonobstructive venous insufficiency: Rationale, techniques, and results in 107 procedures with two- to eight-year follow-up. *J Vasc Surg* 7:301-310.
2. Raju S (1988) Valve reconstruction procedures for chronic venous insufficiency. *Seminars Vasc Surg* 1:101-106.
3. Raju S (1988) A pressure-based technique for the detection of acute and chronic venous obstruction. *Phlebology* 3:207-216.
4. Raju S, Fredericks RK (1986) Late hemodynamic sequelae of deep venous thrombosis. *J Vas Surg* 4:73-79.
5. Raju S (1983) Venous insufficiency of the lower limb and stasis ulceration: Changing concepts and management. *Ann Surg* 197:688-697.