

6. Lane RJ. Repair of venous valves using silicone cuffs In: Greenhalgh RM. Ed. *Vascular Surgical Techniques: an atlas (2nd edition)*. Philadelphia, PA:WB Saunders; 1989:410-7.
7. Belcaro G. Plication of the sapheno-femoral junction. An alternative to ligation? *Acta Chir Belgica*. 1989; 89:305-308.
8. Belcaro G. Plication of the sapheno-femoral junction. An alternative to ligation and stripping? *Vasa*. 1989; 18:296-300.
9. Belcaro G, Christopoulos D, Vasdekis S. Treatment of superficial venous incompetence with the SAVAS technique, *J Mal Vasc*. 1991;16:23-7.
10. Belcaro G, Errichi BM. Selective Saphenous vein repair: a 5-year follow-up study, *Phlebology*. 1992; 7:121-24.
11. Belcaro G. Correction of superficial incompetence with selective saphenous vein repair (SSVR). A five-year follow-up study, *Vasc Surg*. 1993;122-27.
12. Belcaro G, Christopoulos D, Vasdekis S, Errichi BM. Correction of superficial venous incompetence with an external Gore-tex patch applied at the sapheno-femoral junction. A randomised study vs. ligation of the junction. (data on file). Manuscript in press.
13. Belcaro G. Femoral vein valve repair with limited anterior plication (LAP), *J Cardiovasc Surg*. 1993;34:395-8.
14. Belcaro G, Ricci A, Laurora G, Cesarone MR, De Sanctis MT, Incandela L. Superficial femoral vein valve repair with limited anterior plication, *Phlebology*. 1994; 146-149.
15. Belcaro G, Nicolaidis AN, Veller M. *Venous Disorders, A manual of diagnosis and treatment*. London: Sanders, 1996.
16. Cesarone MR, Belcaro G, Nicolaidis AN, Laurora G, De Sanctis MT, Incandela L, Barsotti A. Epidemiology and costs of venous disease in central Italy. The San Valentino venous disease project, *Angiol*. 1997;48:583-592.
17. Belcaro G, Christopoulos D, Nicolaidis AN. Venous insufficiency: noninvasive testing. In: Bergan JJ, Kistner RL, eds. *Atlas of Venous Surgery*. Philadelphia, PA:WB Saunders; 1992:9-24.

Table: WHY TO SAVE THE LONG SAPHENOUS VEIN?

1. In case of DVT less complications (edema, ulcerations, etc.)
2. No obstruction (outflow is better saving the vein)
3. The vein may be useful as a graft
4. Lower costs
5. Noninvasive tests tell you precise sites of incompetence. You do not need to destroy the whole vein.
6. It is physiologically better to correct incompetence more than system destruction.
7. To save the integration between the deep and superficial system (which is a single, composite system) is important for long term outcome.

AMBULATORY VENOUS SURGERY VERSUS SCLEROTHERAPY

**G. Mark Malouf, FRACS
Westmead Hospital
Sydney, Australia**

Great advances have occurred in recent years in venous surgery that have allowed us to perform a walk-in walk-out type of surgery now called ambulatory vein surgery. The development of this type of surgery is at different levels throughout the world and has doctors of different specialties involved in it, including physicians, surgeons and sclerotherapists.

Sclerotherapy over the last few years has also made tremendous advances principally more and/or better solutions or sclerosants available in various countries, more research into the scientific basis for sclerotherapy, better or more convenient methods of compression, and better placement of needles into veins using duplex ultrasound.

When comparing and contrasting these two methods of treating varicose veins I think we have to compare ideal ambulatory venous surgery done with good anaesthesia, minimal access incisions, hook phlebectomy, and compression, with ideal sclerotherapy using what we think is the best sclerosant, of course using the best techniques and achieving good compression for an adequate period of time with

minimal patient discomfort. Both of these techniques therefore will produce good results and hopefully the best possible result.

In years past, surgeons performed traditional major varicose vein surgery in hospital and this was quite an ordeal for the patient. Surgeons soon learned that less radical, better tailored operations using new techniques of minimal access would enable the patient to be out of hospital quicker and back to work earlier with far less morbidity. This progressed to the use of local anaesthesia and hook phlebectomy, so that a lot of this surgery is now done in the rooms.

Traditional European sclerotherapists held a strong view that all types of varicose veins could simply be treated by repeated and extensive courses of sclerotherapy. The dedicated sclerotherapists are divided in their opinion as to the wisdom of this approach. Many have seen the wisdom of surgical removal of large varicose veins, which produced a more effective and long lasting result and with the advent of hook phlebectomy followed by compression sclerotherapy, better and more long lasting results were produced. Some sclerotherapists, however, armed with duplex scanning for placement of needles in bigger and bigger veins, have been seduced into believing that injection of large volumes of high concentration sclerosants into the saphenous trunks would produce just as effective a result as surgical removal of the vein. This has prompted a push in some sections for routine ultrasound guided placement of needles and sclerotherapy for even the most major of varicose veins cases.

Ambulatory venous surgery can be done under general anaesthesia, in a day surgery centre or licensed operating room. The patient is in "hospital" usually for about four hours, there is no restriction on the extent of vein surgery performed, including high ligation of the long saphenous or short saphenous veins, stripping, ligation of perforators and multiple phlebectomy. This is still the recommended treatment by surgeons, particularly vein surgeons, in patients suffering from major upstream incompetence. Ambulatory venous surgery under local anaesthesia can be performed in an office setting, either in your consulting room or procedures room. This would basically involve multiple small stabs along the leg and hook phlebectomy of segments of the saphenous trunks, large saphenous tributaries or large reticular veins. It would not involve saphenofemoral or saphenopopliteal ligation or stripping. This is the major form of ambulatory venous surgery that I wish to compare with sclerotherapy.

If the good quality venous incompetence duplex scan that you have ordered or performed on your varicose veins patient shows major upstream incompetence I still believe that the four hours in hospital, general anaesthesia, doing as much as you can to remove those veins surgically, with the patient going home later on that day, but perhaps having some days off work is the best way to proceed in our Australian medical environment. If a patient presents, however, with segmental saphenous vein incompetence, saphenous tributary disease, or with early residual or recurrent varicose veins then the office setting under local anaesthesia is ideal for removing the raised palpable veins and then following this up with sclerotherapy for what is left. This procedure under local anaesthetic is ideal for raised tributaries over bony prominences, such as over the patella or the front of the shin or ankle, or across flexures such as in the popliteal fossa, or for more proximal veins high on the thigh.

Let us now turn to ideal sclerotherapy. There is no doubt that

compression sclerotherapy is suitable for tributaries of the saphenous vein, reticular veins, venules and telangiectasias. When it is performed on large saphenous tributaries and even incompetent saphenous trunks, it is effective at reducing the size and the symptoms of these veins. By itself it is unlikely to control major trunkal incompetence long-term. Sclerotherapists have used improved diagnostic imaging with duplex scanning to improve the placement of their needles under ultrasound control. In so doing, they are cannulating bigger and bigger vessels, but they still need large volumes of high concentration sclerosant to effectively do any damage, mostly thrombosis possibly sclerosis, to these large vessels. I am speaking specifically here of the long saphenous and short saphenous trunks. This technique of ultrasound guided sclerotherapy, particularly to the saphenofemoral junction manages to temporarily occlude or cork this junction, taking the pressure off the varicosities distally. Subsequent sclerotherapy to large veins distally when the pressure is reduced will have a beneficial effect. On some available data, the recanalisation rate of the long saphenous vein at two years is over 40% and so the veins begin to re-open even in the best of hands and the process has to be repeated. It is my strong contention that these major trunks are best dealt with surgically, with high ligation and limited stripping, and at the same time surgically removing the larger varicosities, and thus saving the sclerotherapy for residual and recurrent veins.

Ideal sclerotherapy must use what you regard as the ideal solution. In Australia from 1991 to 1995 we performed an open clinical trial in an effort to introduce aethoxysklerol into the country, comparing it with the two established solutions of sodium tetradecyl sulphate and hypertonic saline (20%). The trial included 120 doctors who were experienced injectors, and a series of 34,878 legs that were injected, 40% principally for varicose veins, and 60% for surface or spider veins. The results of that trial showed most injectors to believe that aethoxysklerol had a better efficacy than the established solutions, was much less painful for the patient on injection, produced less frequent and less severe injection ulcers, pigmentation and phlebitis. The clinical occurrence of deep vein thrombosis in that trial was one leg in 7,000 injected. This has led a large proportion of Australian doctors performing sclerotherapy to chose aethoxysklerol as their preferred or best sclerosant.

We must of course compare potential complications of the two forms of treatment that we are discussing. With minimal access technique the scarring with hook phlebectomy is indeed minimal. Trauma to cutaneous nerves and subcutaneous lymphatics is certainly possible but rare and with experience of this technique can be avoided. When looking at sclerotherapy, even using one's ideal solution, the problem of retained blood in the vein, thromboembolism, toxicity of the sclerosant, telangiectatic matting and injection ulceration remain possible, but again with a low incidence.

As individual doctors practising on their patients daily, we encounter many variables that go into our decision to advise the patient to have one treatment or the other. As far as the treating doctor is concerned, he may have very little time available and it is obvious that the surgical removal of veins takes longer, but he is rewarded proportionally to his time expended and so the cost is higher. If he is a sclerotherapist or physician who is not used to actually making incisions and pulling things out then this may influence him towards sclerotherapy, but if he is a surgeon who finds hook phlebectomy

quick, easy and satisfying then this direction may be followed. The doctor's access to facilities and equipment is also a vital factor. The patient also presents variables in the eventual decision and sometimes they demand one way and one way only to be treated. The level of financial remuneration governed by their level of medical insurance is also going to be a factor, but what is a very important clinical factor is the site of the veins on the legs and over any difficult site surgical excision of raised palpable veins in my opinion does a lot better than sclerotherapy.

And so ambulatory venous surgery can be used on saphenous trunks, major saphenous tributaries and large reticular veins. It is more time consuming than sclerotherapy, but one treatment is all that is required to remove the particular vein. Compression following ambulatory venous surgery need only be for 48 hours and there is a very low medium term recurrence rate with very good patient satisfaction. Pigmentation, ulceration and phlebitis do not occur after this technique. Sclerotherapy, looking at the same parameters, can be used on large and small veins alike from saphenous trunks all the way down to telangiectasias. It is a much quicker technique to perform than ambulatory venous surgery, but often requires multiple treatments and longer compression, depending on the size of the vein, up to six weeks. There is a variable medium term recurrence rate and variable patient satisfaction. When high volumes of high concentration sclerosant are used this has more chance of leading to pigmentation, ulceration or phlebitis.

In summary it is my contention that using the best available minimally invasive ambulatory venous surgery for the larger vessels that are raised and easily removed should then be followed by sclerotherapy, using the best sclerosant available to you, and I consider that to be aethoxysklerol. This will yield your best results. Ambulatory venous surgery versus sclerotherapy therefore should now read ambulatory venous surgery followed by sclerotherapy for best results.

NEW TRENDS AND OPERATIVE TECHNIQUES IN THE MANAGEMENT OF VARICOSE VEINS

J. Leonel Villavicencio, MD, FACS
Uniformed Services
University of the Health Sciences
Bethesda, Maryland, USA

The advances in noninvasive diagnostic vascular technology have allowed us to study with accuracy the anatomy and pathophysiology of the venous system. With the use of the bi-directional Doppler, color-flow duplex scanner, and air plethysmography, we can investigate the venous pathology in a very precise manner and plan the appropriate treatment. As a result of these technological advances, we have learned that the main trunk of the saphenous vein may be quite healthy despite the presence of large clusters of varicose veins in one or more of its tributaries. Sparing a healthy saphenous trunk has become of importance for two main reasons: the first reason is that it makes no sense to excise a healthy organ that is performing its assigned function in a satisfactory manner.¹ The second reason is that the saphenous vein is the most important autogenous conduit utilized as bypass, patch, or substitute in the arterial system.