

# Procedures in Family Practice

## Injection Therapy for Varicose Veins

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The varicose tendency cannot be cured but it can be controlled. Injection compression sclerotherapy, if performed competently on selected patients, is an effective treatment. It is a relatively simple, economical, safe, and ambulatory form of therapy which has a major place in the management of varicose veins. The technique for injection is subject to considerable variation, but the necessity for post injection compression of the veins is absolute. Post injection compression reduces the potential for recurrence by preventing return of the blood to the vein after injection and maintaining contact of the intimal surfaces so that bonding can occur, thus converting the vein from a tube to a solid fibrotic cord. Injection compression sclerotherapy is the best treatment of selected varicosities.

Because of the high incidence of varicosities among Americans, it is disturbing to note the paucity of innovative papers on sclerotherapy in American medical literature. German, Russian, British, and French journals carry most of the articles on sclerotherapy. Usually, papers on this subject in American journals are by foreign authors. Unfortunately, many American physicians still regard sclerotherapy as antiquated, ineffective at best, and dangerous at worst.

Chant et al<sup>1</sup> in their extensive comparative study of injection compression therapy and standard surgery have demonstrated that there are no significant differences in the results of the two forms of treatment. Patients, however, preferred injection compression therapy because it is ambulatory, does not require hospitalization, produces no scars, and is less expensive than surgical treatment. In a carefully controlled study, Hobbs<sup>2</sup> concludes that sclerotherapy surpasses surgery in controlling selected varicosities. Fegan<sup>3</sup> reports that he had 99 percent success with his injection compression techniques, while Orbach and Steub-

ner<sup>4-6</sup> firmly reinforce the claims of the previously cited physicians on the efficacy of sclerotherapy.

The sclerotherapeutic techniques that I shall describe in this paper are based upon years of study and a practice experience involving 1,465 patients, 992 female and 473 male, ranging in age from 17 to 75, treated for varying disorders of the veins.

### Diagnostic Considerations

The diagnosis of varicose veins is no problem. It is easily made by inspection alone. The subject is asked to stand erect on a small platform in a good light, and the varicosities are readily seen.

Intracutaneous varicosities (otherwise referred to as "spider veins" or "rocket bursts") are obvious. The so-called reticular type of veins, which are both intra and subcutaneously located, are also quite apparent. Reticular veins are somewhat larger than the rocket bursts, thin-walled and easily compressible, and tend to collapse on elevation.

The primary diagnostic problem is the determination of the competency of saphenofemoral and the saphenopopliteal junctions and the demonstration of incompetent communicator veins in the thigh and in the leg.

Review of the anatomy is helpful in approaching this problem.

The greater saphenous vein covers essentially the inner side of the thigh and leg. The short saphenous covers chiefly the posterior and lateral aspect of the leg and may, with variations, extend up on the thigh in its lateral aspect.

The long saphenous vein forms by the junction of the veins on the medial side of the dorsum of the foot, courses in front of the medial malleolus proximally up the leg, passes the knee just posterior to the medial condyle of the femur, crosses up the mid thigh two thirds of its length and then flows upward and medially to join the femoral vein through the fossa ovalis. Its diameter varies from 3 to 4 mm in the thigh to 5 or 6 mm in the calf. In its course it receives numerous tributary veins and, although its branches are not the same from patient to patient, the position of the fossa ovalis is a constant anatomical landmark.

The short saphenous originates approximately 2 cm above the lateral malleolus. It is formed by the confluence of veins in the lateral portion of the dorsum of the foot, lateral malleolus and lateral sides and back of the heel. Its distribution is along the back of the leg, receiving tributaries from the lateral side of the leg. In most instances it penetrates the superficial fascia in the popliteal space where it joins the popliteal vein. It may, however, receive the posterior superficial vein of the thigh just before joining the popliteal. The latter may communicate with the long saphenous system or with the deep posterior muscular veins of the thigh and may connect the short saphenous with the internal iliac veins by way of the sciatic and gluteal veins. This latter distribution is less common than the original direct junction of the short saphenous with the popliteal vein in the popliteal space.

With an understanding of the general distribution of these veins, it is not difficult to locate them on the leg with the patient in the erect position standing in good light.

In order to sort out types of varicose veins which deal with the competence of the saphenofemoral, popliteal, and communicator valves, the following tests may be performed. The patient is placed supine on the table. One leg is elevated to an angle of 90°

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liquid sclerosant to insure that the needle is squarely in the vein and that the perivenous tissues are not being infiltrated. Foam penetrates folds and crevices in the vein intima better than the liquid.<sup>4,5</sup> If no local pain or swelling results, proceed with the injection in a single rapid sweep. Determine the amounts of solution to be injected by the size of the patient's veins and his reactivity. Limit injection volume to 1.0 cc of the foamy solution at a single injection site, and to no more than 5 cc of solution in the injection series at one session.

After the injection is completed, have the patient sit on the adjacent examining table and instruct him to elevate his leg as if he were kicking a football. Apply a square of adhesive sponge\* (3M Reston 5.0 by 7.5 cm, 1.1 cm thick; or 2 by 3 inches, 7/16 inch thick) at the injection site. Repeat this process as often as is necessary to complete the necessary number of injections, or until all or part of the 5 cc of the injection fluid has been consumed. Prescribe treatments once or twice weekly, depending upon the mutual convenience of the operator and the patient. Advise patients to pursue their usual activities between visits but to discontinue using contraceptive drugs during the period of treatment. Patients must wear supports throughout the course of treatment but they may be removed for a weekly tub bath. However, supports must be reapplied immediately after the bath. Pressure pads must not be removed until the course of treatment is complete. (See Figures 1 and 2.)

### **Injection Compression Therapy of Intracutaneous Veins**

For intracutaneous veins, the so-called "spider veins or rocket bursts," or the "embryonal type veins," a different technique is used. Have the patient lie either supine or prone on the examining table. The operator uses a loop or a light, supplemented by a magnifying lens, and a fine 27 to 30 gauge needle. The best sclerosing solution for treatment of intracutaneous veins is Scleremo,\*\* a preparation of glycerine

\*Reston — Self Adhering Foam Pads 21.6 cm x 27.9 cm x 1.1 cm, 3M Co., St. Paul, Minn.

\*\*Scleremo — Laboratories E. Bouteille, 7 Rue des Belges, Limoges (France). Not approved in the United States by FDA. Dilute Sotradecol 1% with equal parts saline instead — shake to a foam.

chromate 11 percent diluted with saline, one part Scleremo to one part of saline, or two parts Scleremo to one part saline, depending upon the size of the veins to be treated and the sensitivity of the patient under treatment.

Draw the solution into the syringe with a large needle and replace the mixing needle with a fine needle. Use a new needle at each session. Locate the afferent vein leading into the burst, stretch the skin firmly, enter the vein, and inject the sclerosant with an extremely light pressure on the plunger. To counter resistance, project the needle deeper or withdraw it and try again. Inject only a few drops at each site.

Before the patient leaves the table, apply a wraparound stocking over the sponge pad. (I use the Mijan Vascular Stocking;<sup>7</sup> see Figures 1 and 2.) A wraparound stocking will not displace the sponge pads when applied from instep to knee. For treatment of veins above the level of this elastic support, apply, if necessary, elastic bandages. Patients must wear elastic bandages from four to six weeks throughout the course of treatment, but they may remove the bandages when bathing. The pressure pads must be left in situ. It is essential that the subject apply elastic supports after bathing until the conclusion of therapy in four to eight weeks.

After the operator removes the pads, he may find lumpy, indurated areas in the vein. Frequently, the indurations are tender and painful. Evacuate them by pricking the vein with a sharp, pointed scalpel. Evacuate any thrombi which may be formed by milking the vein toward the incised area and expressing the thrombus. Apply a pressure dressing to this site. On rare occasions post injection sloughs occur. Excise sloughs and suture the skin. Rapid primary union healing with minimal scarring will follow.

The object of therapy is not to thrombose the vein but to convert it into a fibrous cord, thus producing permanent obliteration with no residual thrombi. This eliminates the potentiality for recanalization and embolization. The varicose tendency cannot be cured but it can be controlled. The patient is advised to return for observation semiannually, and if a vein or two appears, they are injected and compressed during the

follow-up visits.

### **Complications**

Fortunately, no serious allergic reaction to the sclerosant appeared at any time in this series of 1,465 patients. Some patients have complained of giddiness, weakness, headache, spots before the eyes, and rarely, urticaria, but all untoward effects were transient and minor. Sensitivity to one sclerosant at times indicated change to another.

When the needle is placed properly in the intracutaneous veins, blanching will appear for several centimeters or more around the injection site. Forcing the injection results in skin sloughs and dark brown, hemosiderin pigmentation; the former produces scarring and the two result in a resistant, cosmetic disaster. Pigmentation may occur in certain individuals regardless of the skill of the operator. Patients, therefore, should be advised of this contingency before treatment is started.

Pigmentation has been lightened with a chelating agent in a vanishing cream alkaline base (Endrate Cream).<sup>8</sup> Pigmentation when untreated is permanent; it will fade very little or not at all. After the injection has been accomplished, compression is achieved with a cotton sponge pad, flattened and spread out, and held in place with paper tape. Intracutaneous veins frequently look bad for several weeks after treatment because of local thrombi and hemorrhage. Again, advise the patient of this contingency before commencing treatment.

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