



## ***Sclerotherapy: Preparation and Practice Makes Perfect***

Though some dermatologists dismiss sclerotherapy, those who master the technique can achieve success and avoid complications from this in-demand therapy.

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**S**clerotherapy is a well-established therapy, widely sought by patients for the treatment of lower extremity varicose and spider veins. Varicosities carry cosmetic as well as symptomatic consequences that are important to treat. The main objective of sclerotherapy is obliteration and fibrosing of target vessels through injection of a sclerosing agent. Some dermatologists elect against providing this treatment due to concerns about potential side effects, inconsistency in treatment success rates, significant time consumption of the procedure, and unsatisfactory reimbursement. Although several published reports have described the variability in the technique, sclerosants, side effects, and efficacy of sclerotherapy, in experienced hands this procedure has shown excellent overall effectiveness, tolerability, and safety profile.<sup>1,2</sup> Consequently, perfection of this procedure can result in a wonderful addition to a dermatology practice.

### **Preparation**

One of the integral elements to achieving satisfaction with sclerotherapy is proper planning. First and foremost, the clinician should be familiar with the anatomy and physiology of the lower extremity venous system. This system functions to return blood from the periphery to the heart. Cardiovascular malfunction due to pump or valve failure results in lower extremity varicosities. The venous system can be segregated into three portions: superficial (saphaneous), deep (popliteal and femoral), and perforating (communicating) veins.<sup>1</sup> Sclerotherapy is ideally indicated for the treatment of intracutaneous and subcutaneous telangiectases or spider veins (red to violet, 0.1-1mm vessels), venulectasias (violet, 1-2mm vessels), reticular veins (blue-green, 2-4mm vessels), and smaller varicose veins (blue, 3-6mm vessels) that drain into the superficial portion of the venous system.<sup>3</sup> Larger superficial veins, such as perforators or saphaneous veins, are best treated by other means, including ambulatory phlebectomy, radiofrequency, endovascular laser ablation, or surgical stripping. Inversely, for fine telangiectatic vessels (telangiectatic mats), alternative therapy to sclerotherapy may include intense pulse light and laser therapies (i.e., pulsed dye laser and 1064nm Nd:YAG laser).<sup>3</sup>

One must also be aware of potential adverse effects associated with sclerotherapy and methods employed to prevent and minimize them. Any patient interested in sclerotherapy should be properly evaluated in advance, at which time the procedure, alternative treatment options, contraindications, possible side effects and informed

consent are documented. It is also very important to discuss with the patient what results they can realistically expect. This is key to maintaining patient satisfaction. Preoperative and postoperative photographs are also advisable.

One should be very familiar with the contraindications to sclerotherapy in order to avoid treating those patients who are not suitable candidates. Absolute contraindications to sclerotherapy include allergy to components of sclerosant, local treatment area or systemic infection, state of immobility, advanced peripheral vascular disease, and pregnancy.<sup>4</sup> Relative contraindications include chronic leg edema, hypercoagulable state, history of DVT, marked atopy, and significant systemic illness (diabetes, renal or liver disease).<sup>4</sup> Therefore, it is very important to perform a lower extremity physical exam with the patient in the standing position in addition to obtaining a proper preoperative history.

Since sclerotherapy is effectively administered in sequence from larger-diameter vessels to smaller varicosities, if the original points of reflux exist within large veins, such as saphenous and perforators, alternative methods of therapy should be performed (i.e., phlebectomy or surgical vein ligation) prior to sclerotherapy to maximize results.<sup>5</sup> Certain clues during evaluation, such as varicosities greater than 4mm, symptomatic or tortuous and long varicose veins, clinical signs of chronic venous insufficiency, previous history of thrombosis, as well as history of prior sclerotherapy failure should prompt the physician to consider further testing of the venous system (i.e., Duplex ultrasound) in order to determine the patient's candidacy for sclerotherapy.

The most common and self-limited complications associated with sclerotherapy include hyperpigmentation (10-30 percent), telangiectatic matting (10-30 percent), bruising, pain, temporary erythema, hemorrhage, and urticaria on

injection.<sup>4</sup> Very rare adverse effects (less than one percent) include allergic reactions, skin necrosis and ulceration, superficial thrombophlebitis, nerve injury, DVT, transient visual changes, and hematuria.<sup>4</sup>

The patient should have realistic understanding and pre-/post-instruction of the sclerotherapy before initiating treatment. Ideally, the patient should anticipate needing a total of two to six treatment sessions, performed at four to eight-week intervals.

### Practice

Results from sclerotherapy may vary considerably based on the technique and experience of the clinician. Results may also vary depending on the individual sclerosant used. The sclerosing agents can be divided into hyperosmotic (e.g., dehydrating hypertonic saline 23.4%), detergents (sodium tetradecyl sulfate (STS) and sodium morrhuate (SM)) and chemical irritant (corrosive glycerin).<sup>3</sup> These sclerosants are FDA approved to be used in the US and in effect, will be the focus of this discussion. However, the use of hypertonic saline and glycerin to treat varicosities is off-label.<sup>3</sup> Each sclerosant has a corresponding efficacy and side-effect profile. While cost effective, injection of hypertonic saline often results in pain and cramping. In addition, there is an increased chance of skin necrosis and hyperpigmentation. STS and SM are associated with a higher likelihood of allergic reactions; however injections tend to be much less painful and are therefore usually better tolerated. Glycerin is an effective sclerosant for tiny telangiectatic mats.<sup>3</sup>

For each of the aforementioned sclerosants, the maximum recommended dose per treatment session is 10mL. The chief principle of successful sclerotherapy technique is use of an optimal volume and concentration of sclerosant to treat a particular-size vessel. It is beneficial for those practitioners with less experience to initially treat few small affected areas

## Contraindications to Sclerotherapy

### Absolute

- Allergy to components of sclerosant
- Local treatment area or systemic infection
- State of immobility
- Advanced peripheral vascular disease
- Pregnancy

### Relative

- Chronic leg edema
- Hypercoagulable state
- History of DVT, marked atopy
- Significant systemic illness (diabetes, renal or liver disease)

## Candidacy for Sclerotherapy

Consider additional venous testing if:

- Varicosities greater than 4mm
- Symptomatic or tortuous and long varicose veins
- Clinical signs of chronic venous insufficiency
- Previous history of thrombosis
- History of prior sclerotherapy failure

***The chief principle of successful sclerotherapy technique is use of an optimal volume and concentration of sclerosant to treat a particular-size vessel.***



with minimal sclerosant concentration and volume (e.g. using 1cc syringe) with more frequent treatment visits to compensate. This will allow the practitioner to develop a better feel and monitor the treatment areas closely.

### **Technique**

Although there are several sclerotherapy techniques, we will describe the technique executed in our practice. More recent procedures incorporating Doppler ultrasound for better cannulation and employing foaming to improve efficiency of sclerotherapy are beyond the scope of this article.<sup>1,2</sup>

First the patient is positioned reclining in the procedure chair in a supine position. Making sure to have proper positioning, lighting and visualization are a necessity prior to performing the procedure. The sclerosant is pre-filled in a 1cc to 3cc syringe, then a 30-gauge needle is placed on the syringe. We find

that treatment is easiest when the needle is bent at a 30-45 degree angle. The treatment site is then prepped with alcohol, and the surrounding skin is gently stretched with the non-dominant hand. The larger, more proximal and centrally-arborizing vessels are treated initially with subsequent injections at about 3cm sections, feeding into smaller vessels. The targeted vessel is swiftly cannulated via air-embolus (0.5cc) or puncture-fill techniques and a small amount (0.1-0.5cc per injection site) of sclerosant is slowly injected until expected temporary blanching occurs. Should a wheal or bleb form after injection, the physician should pause and massage the area and avoid attempting to retreat that area during the session. If the patient complains of significant pain at a specific injection site and the area injected displays prolonged blanching, interruption and massage of the area with the application of nitroglycerin 2% ointment can

be utilized.

Certain standard post-treatment procedures are advised to achieve optimum results and minimize postoperative complications. Cotton balls with band-aids or adhesive tape applied to each site after injection serve as a pressure dressing to decrease bleeding and increase local compression. Patients can then wear Class I (20-30mm/Hg) thigh/knee-high compression stockings for 48-72 hours and up to two to three weeks during the daytime status post therapy.

Compression stockings minimize risks of clotting, hyperpigmentation, bruising, and telangiectatic mats along with augmenting permanent vein eradication.<sup>4</sup> Patients should also be instructed to walk for 30 minutes after the procedure and daily for the next few days, as well as to avoid blood thinners (i.e., aspirin, NSAIDs), minocycline, UV light exposure, and heavy exercise.<sup>2,5</sup>

### **Practice and the Learning Curve**

Sclerotherapy is the gold standard treatment for small lower extremity varicosities. Success rates range from 80 to 90 percent with minimal discomfort, recovery time, and complications.<sup>1</sup> However, the efficacy and efficiency of therapy is highly technique-dependent. With apt knowledge, preparation, and skill, satisfactory outcomes are bound to materialize. Proper performance of sclerotherapy will provide a remarkable and advantageous addition to any dermatologic practice. ■

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