Lower limb telangiectasias are visible, ectatic dermal veins measuring 0.1 to 1mm in diameter. Initially telangiectasias appear as faint erythematous lines, but with time they become progressively more dilated, tortuous, and elevated above the skin surface and turn blue. The term “venulectasia” is used to describe larger blue telangiectasia measuring 1 to 2mm in diameter. Invariably telangiectasias are closely associated with either dilated subcutaneous reticular veins or varicose veins. Frequently a family history of similar abnormally dilated lower limb veins is noted, but this factor is not invariable. The disease appears to be related to western lifestyle (diet, occupation and physical inactivity) with hormonal influences (particularly oestrogen) being pivotal in the ultimate expression of the disorder. Hence telangiectasias and reticular veins are more common in women with their onset frequently precipitated by the hormonal surges of menarche and pregnancy. In certain patients telangiectasias may develop or be aggravated by treatment with oral contraceptives or menopausal hormone replacement therapy. The most common reason for requesting treatment is to achieve cosmetic improvement, it is essential that effective treatment be relatively free of adverse sequelae.

HISTORY AND EXAMINATION

The patient who presents with reticular veins and telangiectasias first should have a directed history and examination. Important information to obtain in the history includes age of onset, possibility of aggravation by past pregnancies, and whether the condition is stable or deteriorating. It is important to note whether the patient’s matching control group. Furthermore, these symptoms were independent of the size of the veins. Because the most common reason for requesting treatment is to achieve cosmetic improvement, it is essential that effective treatment be relatively free of adverse sequelae.
chief complaint is predominantly cosmetic or pain-related because this factor may significantly influence the patient’s expectations regarding treatment outcomes and consequently affect treatment decisions. History taking should focus on whether the patient has had any bleeding disorders, episodes of superficial thrombophlebitis or deep venous thrombosis, and previous treatment, including surgery and sclerotherapy. Past and present use of hormonal contraceptives and hormonal replacement therapy, cigarette consumption, and allergy to any medications should also be noted. A thorough family history will provide valuable information as to the potential severity of the telangiectasia.

Examination of the lower limbs is best performed with the patient standing on a platform in front of the physician. Good lighting is essential for a systematic inspection of each aspect of the leg from the groin to the toes. The patterns of telangiectasias and their relationships to underlying reticular and varicose veins must be noted. It is important to remember that patients with cosmetic symptoms associated with lower limb telangiectatic veins may have incompetence of the major superficial veins (greater or short saphenous veins). In a study of patients presenting with cosmetic symptoms related to lower limb superficial veins, duplex evaluation of limbs with telangiectasias without clinical evidence of associated bulging varicose veins revealed a significant incidence of incompetence in the greater or short saphenous veins† (Table 1). It is uncommon, however, for telangiectasias to be associated with deep venous incompetence. Therefore after physical examination, further diagnostic evaluation with Doppler ultrasound, or duplex imaging should be considered if there is clinical suspicion of incompetence of the greater or short saphenous systems. For example, telangiectasias occurring on the medial aspect of the leg are frequently associated with incompetence in the greater saphenous system. In particular, the appearance of telangiectasias on the proximal medial calf should arouse suspicion of incompetence in the greater saphenous vein and necessitate further evaluation with Doppler or duplex.† In the absence of obvious truncal varices, the incompetence is generally segmental with a competent saphenofemoral junction.

Isolated telangiectasias located on the mid and distal calf should arouse the suspicion of short saphenous vein incompetence. If Doppler examination confirms reflux in the short saphenous system, duplex imaging will be required to determine the extent of incompetence and whether the short saphenous vein terminates in the popliteal vein, femoropopliteal vein or as a branch of the thigh segment of the greater saphenous vein (thigh posterior circumflex vein).14

Finally, clinical photographs should be taken to document the pretreatment state of all affected areas. This step is essential to assess progress during treatment and clarify whether adverse sequelae (e.g., telangiectatic matting) have occurred as a result of treatment. A high standard of photography is required and good results normally will be achieved by using a 35mm, single-lens reflex camera with macro lenses combined with a macro-flash unit. Recently, high resolution digital cameras have become available. It is likely that, in time, these will become the preferred means of taking clinical photographs as they allow attachment of clinical photographs to a patient’s computerized records with the associated significant advantages in storage and retrieval. The background for photographs should be plain and uncluttered. For colour photographs a neutral background, such as light blue, is recommended. Progress photographs taken during treatment are necessary only to document unusual or adverse effects.

At the time of initial consultation, the patient should be informed fully about the treatment, the expected outcome, and the nature and likelihood of any adverse effects. This information should be made available to the patient in the form of a comprehensive information leaflet or brochure that the patient can refer to during treatment. Patients with cosmetic symptoms related to telangiectasias often have high expectations regarding ultimate outcome, and a realistic goal should be agreed on between patient and physician before treatment is begun.

**The Sclerotherapy Room**

Since a visit to the sclerotherapist can be a traumatic experience for some patients, a relaxing environment is essential. A warm and neutral decor and soothing background music will assist in relaxing the anxious patient and, in turn, will aid the sclerotherapist in performing his or her work efficiently.

The patient is placed in the supine position on a table that is positioned in the room so

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**Table 1. Venous incompetence according to clinical classification**

<table>
<thead>
<tr>
<th></th>
<th>Telangiectasias only (n = 83)</th>
<th>Telangiectasias and varicose veins (n = 314)</th>
<th>Varicose Veins only (n = 84)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average age (yr)</td>
<td>39.7</td>
<td>41.4</td>
<td>42.5</td>
</tr>
<tr>
<td>Superficial incompetence %</td>
<td>22.9</td>
<td>49.0</td>
<td>66.7</td>
</tr>
<tr>
<td>Deep incompetence %</td>
<td>0</td>
<td>1.6</td>
<td>1.2</td>
</tr>
<tr>
<td>Perforator incompetence %</td>
<td>1.2</td>
<td>10.6</td>
<td>13.1</td>
</tr>
</tbody>
</table>

*Modified from reference 11 with permission*
that the sclerotherapist can move around it easily. Such placement will assist in minimizing the need to reposition the patient and help to avoid placing the patient in awkward and uncomfortable postures. Good lighting is essential, with well-placed overhead fluorescent lighting that provides shadow-free illumination and obviates the need for additional accessory floor lights that can become unnecessary obstacles. Fluorescent lighting also is superior to incandescent lighting for highlighting the blue colors of reticular veins. Overhead “operating” spotlights have been recommended, but such lights are expensive and generate heat within the room, making it uncomfortable for both the patient and the sclerotherapist.

A stool is situated on either side of the treatment table. In general, sclerotherapy of small veins should be performed with the sclerotherapist in the sitting position, which allows the physician to rest his or her arms on the sides of the table for greater steadiness. Either the table or the stool should be readily adjustable in height to optimize the position of the patient relative to the physician. A Mayo stand should be easily accessible to the sclerotherapist, especially if a nurse is not assisting. The stand is equipped with sclerosant solutions, needles, syringes, compression pads, gauze swabs, alcohol solution, and emergency drugs.

**TREATMENT PLAN**

The presence of telangiectasias should not be considered in isolation from the larger veins into which they drain. If one disregards treatment of reticular veins and proceeds directly to microsclerotherapy of telangiectasias, early recurrence will be noted in most instances because of persisting pressure from proximal sources of superficial venous reflux. There will also be an increased incidence of post-sclerotherapy hyperpigmentation and telangiectatic matting. Therefore sclerotherapy of telangiectasias should follow a systematic plan, consisting of the following steps: (1) treatment of associated greater or short saphenous vein incompetence (if present), (2) treatment of branch varicosities (if present), (3) sclerotherapy of associated reticular veins, and (4) microsclerotherapy of telangiectasias.

**Treatment of Reticular Veins**

The distinction between reticular and varicose veins is arbitrary. Reticular veins are defined as those abnormally dilated subcutaneous veins that are blue, non-bulging, measure 1 to 3mm in diameter, and are directly associated with telangiectasias. These reticular veins, are seen most commonly over the posterolateral aspects of the thigh and the lateral aspect of the calf. In general, they appear to drain toward the popliteal fossa, with the associated telangiectasias radiating away from the knee.

**Order of Treatment**

As with sclerotherapy of varicose veins, the order of treatment should proceed from proximal to distal, from areas of reflux downstream, and from larger caliber veins to smaller caliber veins. A good method is to begin giving injections at the proximal posterior thigh with the patient lying prone and to proceed distally toward the ankle before changing the patient to the lateral position. Once again injections are commenced from proximal to distal points. Next, the anterior and medial aspects of the leg are treated similarly. By using this systematic approach, abnormal veins will not be neglected. Knowing which veins to inject comes with experience, but good lighting will assist in determining the sometimes subtle connections between the cosmetically symptomatic telangiectasias in the dermis and associated abnormally dilated reticular veins in the subcutaneous tissues.

Normally only one limb is treated in a single session, with the number of treatments required determined by the extent and severity of venous dilatation. However, the maximum dose of sclerosing solutions allows complete treatment of reticular veins in one limb to be performed in one or two sessions in approximately 90% of patients. Two different approaches may be used if telangiectasias are extensive and require more than one treatment. The first approach is to treat the reticular veins and associated telangiectasias in one or more adjacent areas in the same session and to leave some untreated until the next session. The second approach is to treat all the reticular veins in the limb in one session and approximately 1 month later to inject the residual telangiectasias. The latter approach often results in fewer injections because many of the telangiectasias fade, either partially or completely, after the source of venous hyper-
**Injection of Reticular Veins**

Two milliliters of sclerosant solution is drawn up in a high-quality, 3ml plastic disposable syringe fitted with either a 27-gauge or 30-gauge needle, depending on the physician’s preference. When injected, the sclerosant should flow easily with a smooth, low pressure action on the plunger. The advantage of the 27-gauge needle in reducing the plunger pressure is countered by the disadvantage of a slightly more painful skin puncture. Alternatively, a 30-gauge needle is preferred if a slow injection flow rate is required or if the patient is more sensitive to pain or feels anxious. The most common mistake in technique is to transect the vessel on needle insertion. Therefore it is helpful to bend the needle to an angle of 30 to 50 degrees with the bevel up, so that on insertion the bevel will remain pointing upward.

There are two methods of vessel cannulation for reticular veins. The first method is similar to that for injection of telangiectasias, which will be described later. The second method (preferred by many, particularly those who are developing expertise in this field) is to insert the needle slowly but deliberately and to withdraw blood into the hub of the needle (this can be done with both 27-gauge and 30-gauge needles) in order to ensure that the needle bevel is located in the vein lumen before injection. With this method, tissue tension can be achieved by using the dorsal aspect of the nondominant index finger to stretch the patient’s skin towards the syringe, which is rested on the pulp of the index finger and distal interphalangeal joint of the middle finger of the nondominant hand (Figure 1). If an awkward location (e.g., around the anterior aspect of the knee) prevents adequate tissue tension from being achieved by this method, digital pressure by an assistant may be required.

The volume of sclerosant injected depends on ease of flow, concentration of the sclerosant, and diameter of the vein. In general, no more than 0.5ml should be injected at any one site. Frequently the endpoint is reached when the physician detects a slight increase in resistance to the flow of the solution, denoting vessel spasm. During injection the physician observes the direction of the flow of the sclerosant as the solution replaces blood in the vein and observes for vasospasm. The physician should stop injecting when the desired length of vein has been treated. The maximum length of a reticular vein that can be treated with one injection is approximately 10cm when a detergent solution is used. If osmotic solutions are used, more injections may be required because of the more localized effect produced.

During, and immediately after injection, the reticular vein undergoes spasm. Within several minutes the vessels and the surrounding skin become erythematous, indicating adequate endothelial damage. This inflammation is more apparent with polidocanol than with STS, hypertonic saline solution, or chromated glycerin. If associated telangiectasias become inflamed during treatment of reticular veins, this result indicates passage of sclerosant into the telangiectasias, and no further treatment of the telangiectasias is required. However, highly concentrated solutions should not be injected into telangiectasias because this method will result in a higher incidence of postsclerotherapy pigmentation and cutaneous ulceration. Immediately after injection, pressure is applied to the injected veins by using cotton balls with pieces of paper tape stretched firmly over them. Patients usually remark that this method helps to relieve any postinjection pain. Unless the patient has a sensitivity to paper tape, the cotton balls are left in place for 24 to 48 hours.

**Microinjection of Telangiectasias**

Microinjection of telangiectasias can be performed when reticular veins are treated or, alternatively, 4 to 6 weeks later to allow for resolution of venous hypertension from the reticular veins. The order of treatment is identical to that of reticular veins, that is, injection is started proximally and proceeds distally until one particular aspect of the leg has been completed.

*Figure 2. Three point tension technique*

*Figure 3. Two point diagonal tension*
Magnifying loupes with powers from 2 to 3.5 magnification are recommended for obtaining good results. However, these may not be necessary for the experienced sclerotherapy practit. Before injection, the skin may be wiped with alcohol. This step changes the refraction coefficient of the skin, making the telangiectasias more visible by indirect lighting. Alcohol also causes some dilatation of the telangiectasias. Disposable 3ml plastic syringes are used, again filled with 2ml of sclerosant. All injections are made with a 30-gauge needle, which may need to be changed after three or four injections if it becomes dull. Needles of finer gauge (32- or 33-gauge) can be used for very fine vessels, such as those that occur in telangiectatic matting, but these needles are expensive and dull rapidly.

Tissue tension can be achieved by using the three-point technique of stretching the patient’s skin between the physician’s index finger and thumb of the nondominant hand and the fifth digit of the dominant hand, which is holding the syringe (Figure 2). Alternatively, two-point tension between the index finger and thumb of the nondominant hand with tension applied diagonally across the line of injection often suffices (Figure 3).

The needle should be bent to an angle of 30 to 50 degrees to prevent transection of the vessel. With the physician’s dominant hand held steady, the needle tip is rested on the skin surface with the tip initially just piercing the epidermis. A gentle thrust is then made toward the vessel lumen to cannulate the telangiectatic vessel. The feel for this movement develops with experience, and with practice telangiectasias even smaller than the diameter of the needle can be cannulated reliably.6

The injection of sclerosant should be slow and limited to a maximum area of approximately 5 square cm. Excessive sclerosant concentration or injection pressure is manifested by perivascular blanching following by acute severe erythema around the telangiectasia. The injection should be stopped at the first indication of extravasation. After one area has been treated, cotton balls fixed with paper tape are applied to the injection sites.

The air-block technique for injecting telangiectasias, in which a small volume of air is injected ahead of the sclerosant, has been recommended by some sclerotherapists.2 This technique has the advantage of ensuring that the needle tip is located in the vein lumen. In addition, it has been hypothesized that replacement of blood by air results in maximum irritation of the endothelium by the sclerosant. However, this method is usually unnecessary since sclerosant flows in a laminar fashion in vessels <0.4mm in diameter,19 and the experienced physician acquires the “feel” of knowing when the needle tip is located correctly. The air-block technique may be useful for the novice, however, especially when hypertonic saline is being injected because it destroys all cells within its osmotic gradient and therefore is more likely to cause cutaneous necrosis when injected extravascularly.20 It is my experience that injecting air with the sclerosant (whether using hypertonic saline or detergent solutions) tends to precipitate visual disturbances or migraines in susceptible individuals.

**Sclerosing Agents**

The purpose of sclerotherapy is to produce endothelial damage that results in permanent endofibrosis and clinical obliteration of the vessel. The ideal sclerosant would have a highly specific mechanism of action, would be free of adverse effects when used for this purpose, and would not produce allergic reactions. Although many agents have been used in treating reticular veins and telangiectasias, thus far none have completely satisfied the criteria for the ideal sclerosant.

The sclerotherapist should have a sound knowledge of the mechanism of action and the adverse effects of all available solutions in order to select the sclerosant that will optimize results in each patient. The following agents are commonly used in the treatment of reticular veins and telangiectasias.

**Osmotic Agents**

Osmotic agents exert their effects by dehydrating endothelial cells through osmosis, which results in endothelial destruction. They are hypertonic solutions, and their effect is dependent on the existence of an osmotic gradient. Because osmotic agents are rapidly diluted in the bloodstream, they lose their potency within a short distance of injection and are less effective in the treatment of veins larger than 3 to 4mm in diameter.20

**Hypertonic saline solution.** Hypertonic saline is the most commonly used osmotic agent. The advantages of hypertonic saline are its low cost, ready availability, lack of allergenicity of unadulterated solutions, and rapid clinical effect.21-23 It also has been reported to cause less telangiectatic matting compared with polidocanol.24 The significant adverse effects of hypertonic saline relate to its non-specific action of destroying cells within its osmotic gradient.20 Therefore extravascular injection is liable to cause cutaneous ulceration, which can also occur with intravascular injection via diffusion through a damaged endothelium. Diffusion of hypertonic saline through the vein wall also results in irritation of adventitial nerves, causing postinjection pain and transient muscle cramping. Therefore injection technique, concentration, and volume are particularly important when this agent is being used.

Attempts have been made to reduce postinjection pain from hypertonic saline by the addition of local anesthetics such as procaine.21 However, this practice appears to be counterproductive because the local anesthetics are acidic (and therefore contribute to transient pain on injection) and...
have known allergenicity, the very properties that proponents of hypertonic saline wish to avoid. The addition of heparin to hypertonic saline in an attempt to prevent thrombosis in larger vessels and to reduce the incidence of thrombophlebitis and post sclerotherapy pigmentation has been found to be of no therapeutic benefit in treating telangiectasias. Concentrations of hypertonic saline used to treat telangiectasias range from 11.7% to 23.4%, the latter being the standard concentration available for use as an abortifacient. The incidence of postinjection pain, muscle cramping, cutaneous ulceration, and post sclerotherapy pigmentation is proportional to the concentration of solution used.

### Detergent Solutions

Detergent solutions include sodium morrhuate, ethanolamine oleate, sodium tetradecyl sulphate (STS), and polidocanol. These agents act specifically on venous endothelium. They induce sclerosis by damaging the endothelium via interference with cell membrane lipids. They exert their effect along the vessel until either diluted or inactivated by serum surfactants. Only STS and polidocanol are widely used for the treatment of telangiectasias. Table 2 gives the approximate equivalent concentrations of STS and polidocanol required for the treatment of lower limb veins. Because of their different mechanisms of action, it is difficult to compare concentrations of detergents solutions with hypertonic saline. However, in the dorsal rabbit ear vein, polidocanol 1% is equivalent in potency to hypertonic saline 23.4%. Other factors apart from vein diameter need to be considered in selecting the concentration of solution. Patients younger than 25 years of age generally require weaker solutions to achieve effective sclerosis. Also, care should be taken with elderly patients and cigarette smokers because they may have coexisting diminished cutaneous perfusion which increases the risk of post-sclerotherapy cutaneous necrosis. The area to be treated also influences the choice of concentration.

### Table 2. Approximate equivalent concentrations of STS and polidocanol required for effective sclerosis of increasing caliber of lower limb vein

<table>
<thead>
<tr>
<th>Vein Caliber (mm)</th>
<th>STS Concentration</th>
<th>Polidocanol Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1-0.5</td>
<td>0.1</td>
<td>0.25</td>
</tr>
<tr>
<td>0.5-1</td>
<td>0.2</td>
<td>0.5</td>
</tr>
<tr>
<td>1-2</td>
<td>0.3</td>
<td>0.75</td>
</tr>
<tr>
<td>2-3</td>
<td>0.5</td>
<td>1</td>
</tr>
<tr>
<td>3-5</td>
<td>0.75</td>
<td>2</td>
</tr>
<tr>
<td>5-7</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>

STS: Sodium tetradecyl sulphate

Slightly lower concentrations are required on the medial thigh and around the ankle; slightly higher concentrations are needed for treating the lateral and posterior thighs and calves.

**Sodium tetradecyl sulphate.** STS is commonly used in concentrations of 0.10% to 0.50% to scleros lower limb telangiectasias. Concentrations of 0.25% to 0.50% are used to treat reticular veins, and concentrations of 0.10% to 0.20% are used for microinjection of telangiectasias. The appropriate concentrations are achieved by diluting the available strengths of 0.2%, 0.5%, 1% and 3% with normal saline. Isotonic normal saline is used in preference to hypotonic sterile water to minimize pain on injection.

Injection of STS results in immediate vessel spasm, which aids hemostasis after needle withdrawal. When the correct dilution is used, there is a transient blanching of the vessel followed by mild erythema. Although STS has a predictable and constant effect within the same caliber and type of vein at the same level or area of the leg, there can be variation in sensitivity of effect among patients. Younger patients with veins that have been present for a relatively short time appear to require lower-strength solutions compared with older patients with long-standing venous dilatation. In addition, I have observed that cigarette smokers appear more sensitive to solution concentration, possibly as a result of chronic endothelial damage and increased endothelial permeability caused by carbon monoxide and nicotine. This increased sensitivity is likely to be directly proportional to the number of cigarettes smoked per day. Systemic reactions to STS, including allergy and anaphylaxis, are extremely rare in the treatment of telangiectasias.

The main disadvantage of STS is the pain it causes for several minutes after injection, especially when the reticular veins are being treated. The pain usually is relieved by applying pressure to the injection sites by using cotton balls held firmly in place with paper tape. Alternatively, an ice pack placed over the treated area for several minutes will reduce the pain significantly. The 0.10% to 0.20% solutions used for microinjection cause minor discomfort. Cutaneous ulceration has been commonly reported when STS is used for the treatment of telangiectasias. These high rates of cutaneous ulceration always have occurred when excessive concentrations were used for microinjection. Reiner showed that cutaneous necrosis after intradermal injection of STS in rabbits was concentration-dependent, with 0.313% solution producing no necrosis and 1.25% solution producing necrosis. In the microinjection of telangiectasias, STS rarely causes cutaneous necrosis when diluted to 0.15%.

**Table 2. Approximate equivalent concentrations of STS and polidocanol required for effective sclerosis of increasing caliber of lower limb vein**

<table>
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<th>STS Concentration</th>
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<td>0.1-0.5</td>
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<tr>
<td>0.5-1</td>
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<td>0.5</td>
</tr>
<tr>
<td>1-2</td>
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<tr>
<td>2-3</td>
<td>0.5</td>
<td>1</td>
</tr>
<tr>
<td>3-5</td>
<td>0.75</td>
<td>2</td>
</tr>
<tr>
<td>5-7</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>

STS: Sodium tetradecyl sulphate
Polidocanol. Polidocanol is used in concentrations of 0.25% to 2% to sclerose lower limb telangiectasias. Concentrations of 1% to 2% are used to treat reticular veins, and concentrations of 0.25% to 0.75% are used for microinjection of telangiectasias. Polidocanol is available in standard concentrations of 0.5%, 1%, 2%, 3%, and 5%. Other concentrations are achieved by diluting with normal saline. Experimental evidence in the dorsal rabbit ear vein indicates that polidocanol is a weaker agent than STS in producing effective endosclerosis of telangiectasias.

Compared with STS, polidocanol causes less vessel spasm and more erythema, resulting in increased bleeding after needle withdrawal. In part, this effect may be a result of the addition of alcohol 5% to the solution as a preserving agent and for enhancement of its solubility. Like STS, polidocanol has a predictable effect within the same caliber of vein and area of the leg, but variation in effect between patients occurs. Systemic reactions to polidocanol when used in the treatment of telangiectasias have been reported and occur at a frequency of 0.2 - 0.3%.

Because of its inherent local anesthetic properties, polidocanol causes less pain after intravascular injection compared with STS however it tends to be slightly more painful at the moment of injection, especially if there is any extravasation. Cutaneous ulceration is uncommon when concentrations of 0.25% to 1% are used, but it does occur with solutions over 1%. Guex believes that small necroses occurring after injection with polidocanol result from excessive injection pressure and may be avoided by a good technique and using 2.5ml syringes instead of insulin (1ml) syringes. Owing to its similar mechanism of action, this advice would also apply to the use of STS.

**POSTSCLEROTHERAPY COMPRESSION**

Initially described by Orbach and Sigg in the 1950’s and popularized by Fegan in the 1960’s, a period of continuous compression of varicose veins after injection is now considered essential in producing long-term sclerosis. A number of theoretical reasons have been suggested to explain why continuous compression improves results in the treatment of telangiectasias. First, adequate compression may result in direct apposition of the treated vein walls to produce a more effective sclerosis. Second, compressing the treated vessels decreases the extent of thrombus formation, helping to prevent recanalization of the treated vessel and decreasing the incidence of superficial thrombophlebitis and postsclerotherapy pigmentation. It also has been speculated that thrombus formation contributes to angio-genesis and the development of telangiectatic matting. Therefore it is possible that post-sclerosis compression reduces the incidence of this complication.

The optimum cutaneous pressure required to achieve these theoretical benefits in the treatment of telangiectasias has yet to be defined. The benefits of graduated compression hosiery in reducing superficial ambulatory pressures and aiding the optimal unidirectional flow of blood toward the heart have been well documented. However, Allan has shown that a pressure of 80mm Hg is required to empty blood from cutaneous capillaries in the standing position at a point 5cm above the medial malleolus. Unfortunately, this degree of pressure results in cutaneous ischemia, especially with recumbency. Therefore a compromise is made by using submaximal graduated compression, which achieves satisfactory patient
compliance yet improves effectiveness of treatment and reduces the incidence of post-sclerotherapy pigmentation and telangiectatic matting.

Graduated compression stockings exerting a pressure of 35 to 40mm Hg at the ankle are more effective than bandaging in the treatment of varicose veins. In the treatment of telangiectasias, Goldman et al. have shown that the incidence of post-sclerotherapy pigmentation is greatly decreased when graduated compression stockings exerting a pressure of 30 to 40mm Hg are used for 3 days after treatment. The same researchers concluded that this degree of compression did not improve effectiveness of sclerosis in thigh telangiectasias or in vessels with diameters <0.5mm. Weiss et al. have shown that daytime post-sclerotherapy compression with Class 1 graduated compression stockings significantly improved results in patients with reticular and telangiectatic leg veins and also reduced the incidence of post-sclerotherapy pigmentation. Maximum benefit was achieved by wearing the stockings for 3 weeks. In my own practice, I have found the following protocol to be adequate: 4 days of continuous graduated compression stocking, followed by a 10-day period of wearing the stocking during the daytime.

**MEDICAL RECORD KEEPING**

At each treatment session a record of the area and type of vein treated, the sclerosant strength and volume and the type and duration of post-sclerotherapy compression should be made. This is best documented in the form of a standard progress chart to ensure that details are not omitted. An example of a computerized chart is shown in Table 3. In this way progress of the patient’s condition can be readily monitored both in the short and long term.

**FOLLOW UP CARE**

Following the final treatment, patients should be reviewed at monthly intervals until both the patient and physician are satisfied with the final result. At these visits intravascular coagula should be removed through a small incision using either a 21 gauge needle or no.11 blade. Generally this procedure can be performed without any anaesthesia. By performing this procedure routinely, the treated veins will fade faster and post-sclerotherapy hyperpigmentation will be minimized. At the same time areas of telangiectatic matting should be noted and, if present, the physician should look for underlying incompletely treated reticular veins. If the cause for telangiectatic matting or resistant telangiectasias is still not clear, duplex examination using a high frequency probe (10MHz or higher) should be considered, in order to locate the proximal source of reflux.

**REFERENCES**


