HOW I DO SCLEROTHERAPY FOR TELANGIECTASIA AND RETICULAR VEIN?

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Yanhee General Hospital

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Yanhee Hospital

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Yanhee International Hospital
History of Sclerotherapy?

**1682**: D. Zollikofer, Switzerland

**1853-1894**: Sclerotherapy success but get Side Effect and Toxicity from Sclerosant

**1946**: Reiner use Sodium Tetradecyl Sulfate

**1966**: Hunshel use Polidocanol

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What is Sclerotherapy?

Mechanism of action for sclerotherapy.

- (A) Proper placement of needle into the vein and release of sclerosing solution.
- (B) Early stage of endothelial destruction and minimal organizing thrombosis.
- (C) Late stage demonstrating fibrous cord formation.

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Sclerotherapy development

- Combine Compression with Sclerotherapy by Sigg, Orbach 1953, Fegan 1960
- Ultrasound guided Sclerotherapy
- Foam Sclerotherapy: Tessari’s Method
Before Sclerotherapy

- History Taking
- Physical Examination

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Before Sclerotherapy

- CW Doppler
- Doppler Ultrasound
- Venogram
- Plethysmography
Before Sclerotherapy

☐ History taking

- General Condition
- Onset, course and Rapidness of Progression
- Aggravating factor
- Symptom like: Heaviness
  - Intolerate to stand or walk for a long time
  - Tenderness, pain along course of vein / area
  - Itching, Cramp, Swelling, Numbness, Restless leg Syndrome
Before Sclerotherapy

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Before Sclerotherapy

- Map diagram
  - All view both legs
  - Use different color for different size
  - Show Ultrasound finding area and vein distribution
Before Sclerotherapy

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Before Sclerotherapy

☐ Take photo for Medical Record

☐ Patient Inform Consent

➤ Information : Method, Advantage / Disadvantage, Complication / Side effect

➤ Post treatment Recommendation :
  - Compression therapy
  - Exercise and activity

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What are Spider veins

- Red and purple sunbursts on skin surface
- Can itch, burn, often seen in combination with varicose veins
- Feed by deeper vessels
What are Reticular vein

- Large blue feeding vessels
- Often seen in combination with varicose vein
- Superficial Reflux feeds spider complexes
Objectives of Sclerotherapy

- Ablation of varicose veins
- Prevention and treatment of complications of chronic venous disorders (CVD)
- Improvement and/or relief of venous symptoms, improvement of quality of life
- Improvement of venous function
- Improvement of the aesthetic appearance
Indications of Sclerotherapy

- Incompetent Saphenous veins (GRADE 1A)
- Tributary varicose veins (GRADE 1B)
- Incompetent perforating veins (GRADE 1B)
- Reticular varicose veins (GRADE 1A)
- Telangiectasias (Spider veins) (GRADE 1A)
- Residual and recurrent varicose veins after previous interventions (GRADE 1B)
- Varicose veins of pelvic origin (GRADE 1B); Varicose veins (refluxing veins) in proximity of leg ulcers (GRADE 1B)
- Venous malformations (GRADE 1B)
Type of Sclerosant

- Hypertonic Solution
  - Hypertonic Saline Solution
  - Hypertonic Dextrose

- Detergent Solution
  - Polidocanol
  - Sodium Tetradecyl Sulfate
  - Sodium Morrhuate
  - Ethanolamine Oleate

- Chemical Irritant
  - Polyiodide Iodine
  - Chromated Glycerin
<table>
<thead>
<tr>
<th>Method</th>
<th>Technique</th>
</tr>
</thead>
<tbody>
<tr>
<td>Micro Sclerotherapy</td>
<td>Liquid or Foam</td>
</tr>
<tr>
<td>Macro Sclerotherapy</td>
<td>Ultrasound guided Sclerotherapy</td>
</tr>
<tr>
<td></td>
<td>Catheter directed Sclerotherapy</td>
</tr>
</tbody>
</table>
Absolute contraindications are:

- Known allergy to the sclerosant
- Severe systemic disease
- Acute deep vein thrombosis
- Local infection in the area of sclerotherapy or severe generalized infection
- Lasting immobility and confinement to bed
- Advanced peripheral arterial occlusive disease (stage III or IV)
- Hyperthyroidism (in the case of sclerosants containing iodine)
- Pregnancy (unless a compelling medical reason exists)

For foam Sclerotherapy:

- Known symptomatic patent foramen ovale.

*(E. Rabe et al. European guidelines for sclerotherapy in chronic venous disorder; Phlebology 2014 Volume 29(6), 338-354.)*
Contraindications

- Relative contraindications are:
  - Leg edema, uncompensated
  - Late complications of diabetes (e.g. polyneuropathy)
  - Arterial occlusive disease, stage II
  - Poor general health
  - Bronchial asthma
  - Marked allergic diathesis
  - Known thrombophilia or hypercoagulable state with or without a history of deep vein thrombosis.

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Contraindications

For foam Sclerotherapy:

- Known asymptomatic patent foramen ovale
- High risk of thromboembolic events
- Visual disturbances or neurologic disturbances following previous foam sclerotherapy
## Technique

<table>
<thead>
<tr>
<th>School</th>
<th>Injection Site</th>
<th>Compression</th>
<th>Instruction Prescribed after Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tournay</td>
<td>Proximal to distal</td>
<td>No</td>
<td>None</td>
</tr>
<tr>
<td>Sigg</td>
<td>Entire varicosity</td>
<td>Yes</td>
<td>Walking</td>
</tr>
<tr>
<td>Fegan</td>
<td>Perforating vein</td>
<td>Yes</td>
<td>Walking</td>
</tr>
<tr>
<td></td>
<td>(6 weeks minimum)</td>
<td></td>
<td>(6 weeks minimum)</td>
</tr>
</tbody>
</table>


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Sclerosant in Thailand

Manufacturer: Kreussler
Distributor: Berlin Pharma
### Dosage and Concentration

<table>
<thead>
<tr>
<th>Size (mm.)</th>
<th>Quantity (ml)</th>
<th>Concentration (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Telangiectasia 1 mm.</td>
<td>Up to 0.2</td>
<td>0.25–0.5</td>
</tr>
<tr>
<td>Reticular Vein 1–3 mm.</td>
<td>Up to 0.5</td>
<td>0.5–1.0</td>
</tr>
<tr>
<td>Varicose Vein &gt; 3 mm.</td>
<td>Up to 2.0</td>
<td>1.0–3.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vein size</th>
<th>Concentration (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1–2 mm.</td>
<td>1 %</td>
</tr>
<tr>
<td>2–4 mm.</td>
<td>2 %</td>
</tr>
<tr>
<td>4–8 mm.</td>
<td>3 %</td>
</tr>
</tbody>
</table>

(Modify from: E. Rabe et al. European guidelines for sclerotherapy in chronic venous disorder; Phlebology 2014 Volume 29(6), 338–354.)
Maximum daily dose of polidocanol (POL)

<table>
<thead>
<tr>
<th>Concentration of POL (%)</th>
<th>Dose (mL) According to Body Weight of Patient</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>50 kg</td>
</tr>
<tr>
<td>0.5%</td>
<td>20</td>
</tr>
<tr>
<td>1.0%</td>
<td>10</td>
</tr>
<tr>
<td>2.0%</td>
<td>5</td>
</tr>
<tr>
<td>3.0%</td>
<td>3.3</td>
</tr>
</tbody>
</table>

2 mg / kg / day

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Volume and injected length.

\[ V = L \times S, \text{ therefore:} \]
\[ L = \frac{V}{\pi(D/2)^2} \]

0.5 cm³ represents a length of approximately

<table>
<thead>
<tr>
<th>Length</th>
<th>Width</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 mm</td>
<td>14 mm</td>
<td>Var. Vein</td>
</tr>
<tr>
<td>10 mm</td>
<td>8 mm</td>
<td>Var. Vein</td>
</tr>
<tr>
<td>25 mm</td>
<td>5 mm</td>
<td>Var. Vein</td>
</tr>
<tr>
<td>160 mm</td>
<td>2 mm</td>
<td>Retic. Vein</td>
</tr>
<tr>
<td>630 mm</td>
<td>1 mm</td>
<td>Telangiect.</td>
</tr>
</tbody>
</table>

Proportional representation of a 0.5 cm$^3$ injection volume

Effects of concentration.

Theoretical modeling of dilution of sclerosing agents in several conditions.

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(Mitchael P. Goldman, Jean-Jerome Guex, Robert A Weiss.
Effects of Archimedes’ law on foam contact with venous wall in veins of various diameters.

How to make foam?

- **Foam Sclerotherapy**

  Mix liquid detergent Sclerosant *(STS, Polidocanol)* with Gas

  **3 Technique**

  - High Speed beating in CO$_2$ rich atmosphere *(Cabrera’s Technique)*
  - Specific gas mixture combined with POL and passed through patent steve in Aerosol canister *(Varisolve, Proventis Ltd, UK)*
  - **Tessari’s Method**: Tranfer between two syringe of Sclerosant and Room air by three way or two way connector
How to make foam?

  - A, 1 mL of detergent sclerosing solution is in one syringe and 4 mL of room air is in the other syringe.
  - B, when the air and detergent sclerosing solution is mixed, a foam is generated.

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(Mitchael P. Goldman, Jean-Jerome Guex, Robert A Weiss.
Vision Aid / Ultrasound guide.

- Optic – Aids

- Veinlite

- Syris

- Accu vein

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Efficiency of foam vs. RF, Laser, UGFS

Compare between Liquid and Foam

Foam better than Liquid in Large varicose vein Treatment (Hamel Desnos et al., Yamaki et al., or Metaanalysis, 2009)

Metaanalysis by Van den bos et al. Compare occlusion rate after treatment by Laser, RF, UGFS and Surgery (High ligation and stripping)

64 Studies / Patient limb 12,320 legs

<table>
<thead>
<tr>
<th>Time</th>
<th>Occlusion rate after Rx (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Laser</td>
</tr>
<tr>
<td>3 years</td>
<td>94.5%</td>
</tr>
<tr>
<td>5 years</td>
<td>95.4%</td>
</tr>
</tbody>
</table>

Conclusion: RF, UGFS and Surgery give similar result

Laser: best result


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Complications and Risks

If performed properly, sclerotherapy is an efficient treatment method with a low incidence of complications. In the context of therapy, a number of adverse events may be encountered in principle. In particular, these are:

- Allergic reaction
- Skin necroses
- Excessive sclerosing reaction (and thrombophlebitis)
- Pickmentation
- Matting
- Nerve damage
- Scintillating scotomas
- Migraine-like symptoms
- Orthostatic collapse
- Thromboembolism.

Complication and Side effects

☐ Frequent and temporary
  ➢ Postsclerosis pigmentation (10–30%)
  ➢ Telangiectatic matting (10–30%)
  ➢ Pain with injection (up to 75% with HS)
  ➢ Postinjection urtication (up to 100%)

☐ Less frequent and temporary
  ➢ Blister due to compression tape (<1%)
  ➢ Contact dermatitis to tape adhesive (<1%)
  ➢ Folliculitis under occlusive tape (<1%)
  ➢ Bruising around injection site (<1%)
  ➢ Ankle edema (<1%)
Frequent and temporary: Postsclerosis pigmentation (10-30%)
Frequent and temporary: Telangiectatic matting (10 - 30%)

A, Before treatment. Note reticular vein feeding into telangiectasia on the superior lateral thigh.

B, 6 weeks after sclerotherapy treatment. Note resolution of superior lateral thigh telangiectasia with appearance of ‘new’ telangiectasia distal to point of injection.

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Frequent and temporary:
Postinjection urtication (up to 100%)

☐ Urtication immediately after sclerotherapy with sodium tetradecyl sulfate 0.1% (B)

Less frequent and temporary: Blister due to compression tape (<1%)

A, Superficial blister that developed 1 week after sclerotherapy treatment; compression of the treated area was produced with an STD pad overlaid with Microfoam tape and a 30- to 40-mmHg graduated thigh-length compression stocking (seen pulled down below the knee).

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(Mitchael P. Goldman, Jean-Jerome Guex, Robert A Weiss.
Rare Complications

- Less frequent, minor, and temporary
  - Microthrombus or intravascular hematoma

- Rare but self-limited
  - Cutaneous necrosis
  - Superficial thrombophlebitis

- Extremely rare but major
  - Arterial injection with distal necrosis
  - Systemic allergic reaction
  - Deep vein thrombosis
  - Pulmonary embolus
Cutaneous necrosis after injection with polidocanol 0.5% into telangiectasia.

- A, Preinjection.
- B, Early atrophie blanche 10 days after injection.
- C, Superficial ulceration is present 5 weeks after injection.
- D, Clinical appearance 24 weeks after injection; complete resolution had occurred in 12 weeks.
Pressure and syringe. Small syringes increase the risk of extravasation and necrosis (micro arteriovenous fistulas, backflow injections).


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Extensive superficial phlebitis with very little/no thrombotic material within the vein lumen. The picture was taken 15 days after injection of 2.5 mL polidocanol 0.5% in multiple reticular and spider veins of the same limb. The great saphenous vein had not been injected. The patient was treated with tamoxifen (for 3 years after breast cancer treatment); no evidence of cancer recurrence has been observed. Evolution of pigmentation is unknown. Clinically, this phenomenon is very similar to Mondor’s disease.

A, 2 days after duplex-assisted sclerotherapy with STS 1.0% into the gastrocnemial area to treat cutaneous telangiectasia. Note mottled skin. Treatment consisted of pain medication and local infiltration with lidocaine.

B, 3 weeks after treatment, a well-circumscribed necrotic area is apparent.

C, Intraoperative debridement of all necrotic tissue to fascia.

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(Mitchael P. Goldman, Jean-Jerome Guex, Robert A Weiss.
Prolonged blanching, the occurrence of a macular erythematous patch, and a very dark ecchymosis are common premonitory signs of impending tissue necrosis.

Set Injection Sclerotherapy

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Equipment

- Lamp: Fluorescent, White
- Adjustable chair / bed
- 70% Alcohol / 2% hibitane in 70% Alcohol
- Syringe 3 ml, 5 ml, Three way
- Needle # 30, 27, 25
- Sclerosant: 0.25%, 0.5%, 1%, Polidocanol label with different color or Sticker

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My practice

- Manage leakage point before
- Proceed from large to small
- Along distribution of vein: lateral plexus of Albanese, great saphenous vein, small saphenous vein
- Patient in lying position: 4 Step
- Reticular vein => use foam 0.5% Polidocanol liquid: air = 1:3, 1:4
- Telangiectasia: liquid 0.5% Polidocanol
- Strict to maximum dosage
- Foam maximum: 20 ml (Theory 6, 10, 12 ml)
- If patient afraid of needle / pain give Sedation
- Follow up 2 – 4 week (Preferable 4 week)

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Distributions of GSV, SSV

Diagram of the great saphenous vein (GSV) and small saphenous vein (SSV) ‘systems’. (Redrawn from de Groot WP: J Dermatol Surg Oncol 15:191, 1989.)

Position of Injection Sclerotherapy

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Post Sclerotherapy

Before

After

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Post Sclerotherapy

Before

After

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Post Sclerotherapy Management

- Observe complication
- Apply compressive stocking class I, II at least 1 week
- Recommend exercise such as walking 15–30 min everyday
- Follow up every 2–4 weeks
 Technique and precaution in vein treatment

- Explain to patient about Result 80% – 90% only
- Photo before treatment is a must
- Support is recommend in all size
- Emergency or Resuscitate unit need to prepare
- Syringe 3 ml is recommend with 1–2 ml of sclerosant only for beginner
- Caution when injection around med. and lat. malleolus, Popliteal Fossa

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“We feel from our three and one half years experience that the surgeon who believe that there is nothing more required than a syringe, some solution, and a patient to effect permanent obliteration varicose vein, still have much to learn.”

Henry Faxon
Harvard Medical School 1993
Thank You