

Ultrasound Guided Sclerotherapy: Adjuvant to Saphenous Vein Ablation

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Disclosure

No conflicts of interest to disclose

No off label use of devices

Off label use of medications will be discussed

Sclerotherapy

- Injection of medications into veins
 - Irreversible endothelial damage
 - Non-thrombotic occlusion
 - Venous sclerosis

Sclerotherapy

- Performed as treatment for
 - Non-truncal varicies
 - Telangiectasias
 - Truncal varicies after truncal reflux eliminated
- Eliminates varicose and spider veins
 - Completes treatment
- Potentially minimize future recurrences

Sclerosants

- Ideal Sclerosant
 - Non allergenic or toxic
 - Painless
 - No pigmentation or telangiectatic matting
 - No ulceration with extravasations
 - Concentration threshold (will not affect non-target veins)
 - FDA approved
 - **Such a drug does not exist**

Most used sclerosants

- Detergent class
 - Sotradecol
 - sodium tetradecyl sulfate
 - Aethoxysclerol
 - polidocanol

Detergent Properties

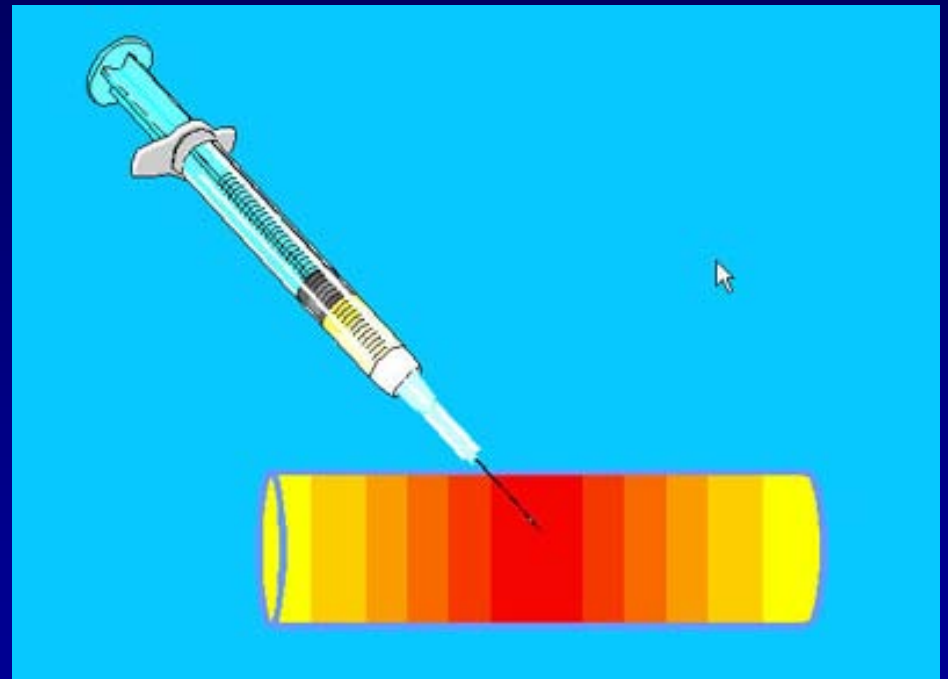
- Efficient sclerosants
- Painless
- Low rate of allergies
- Low to moderate rate of pigmentation
- Low to moderate rate of matting
- Extravasation can be tolerated at low concentrations

Detergent formulations

- Liquid sclerotherapy
 - Effective with small to moderate veins
 - Can be used to occlude larger veins
 - More trapped blood and pigmentation
 - Low complication rates

Detergent formulations: Foam Sclerotherapy

- Detergent sclerosants can be agitated to create a foam
- Increased efficacy
 - displaces blood
 - less dilution
 - long contact time
 - Use smaller volumes and ? lower concentrations



Detergent formulations

- Can treat large veins better than liquid
- Potentially higher complication rates
 - DVT
 - Paradoxical emboli (brain)
 - ? long term lung effects from prolonged contact with foamed agents

Drug doses

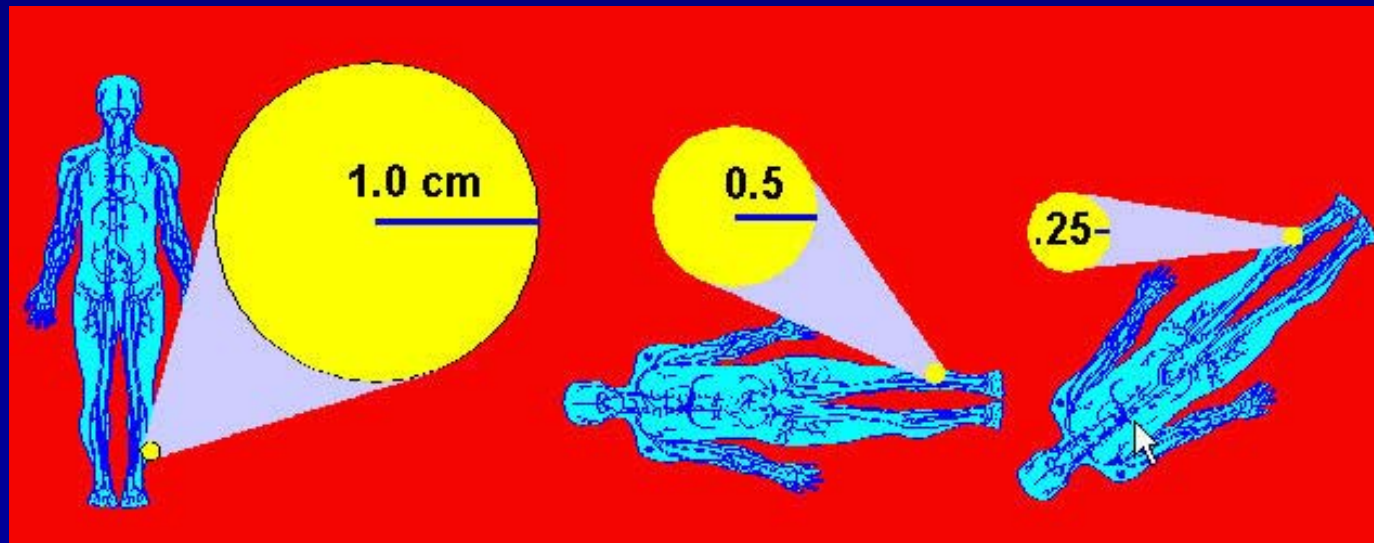
- Concentration and volume increase with the size and length of the vessel being treated
 - Most liquid STD injections range from
 - Spider veins 0.2-0.5 ml
 - Reticular veins 0.5 – 1 ml
 - Varicose veins 0.5 – 1.5 ml
 - Truncal veins 2– 6 ml (liquid), less with foam

Drug formulations: Sotradecol

- Spider veins
 - 0.1-0.3 %
- Reticular veins
 - 0.3-0.5 %
- 4-10 mm varicose veins
 - 0.5-0.75
- 10-20 mm veins
 - 0.75-3%
- Truncal veins incompetence: ? 3% Foam

Sclerotherapy – Technique

- Inject the patient in the supine position
 - Decreases implications of vasovagal reactions
 - Minimal varicose vein volume
 - less dilution



Sclerotherapy

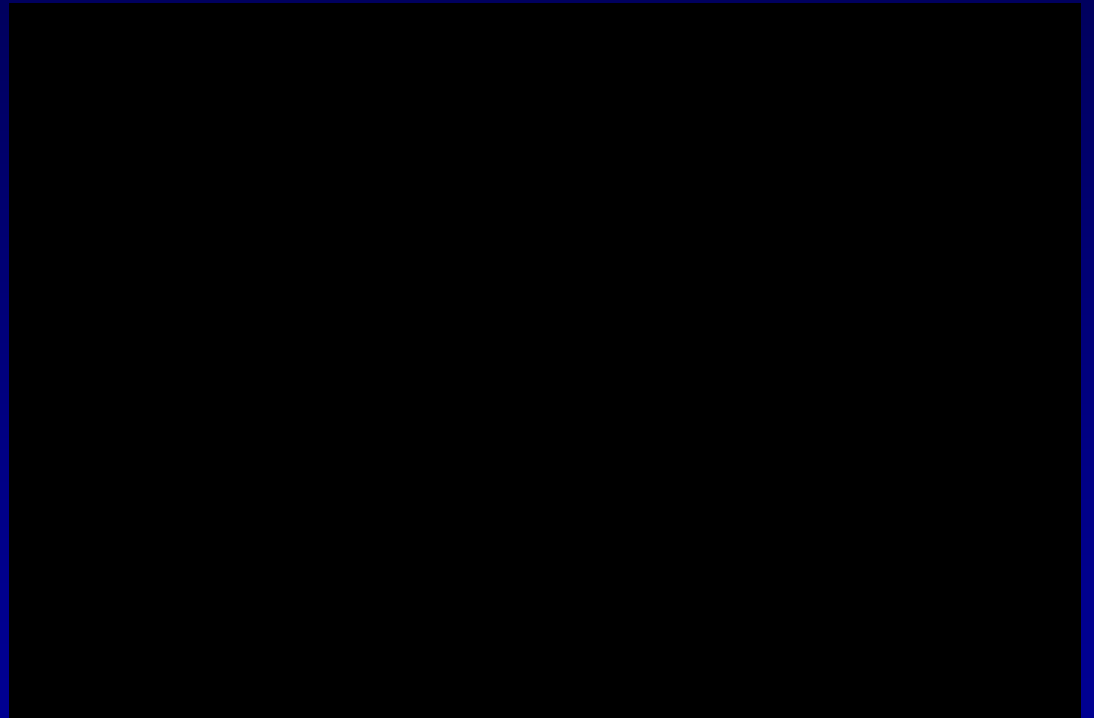
- Done over several visits
 - ? Less visits with foam
- Follows the pathway of incompetence
 - Proximal to distal
 - Largest to smallest
- Utilizes
 - Compression to minimize trapped blood
 - Microthrombectomy to minimize pigmentation

Drug delivery

- Guided by
 - Direct vision
 - Trans-illumination
 - Ultrasound
 - Fluoroscopy

Drug delivery

- Direct vision with needle/syringe
 - Most used technique

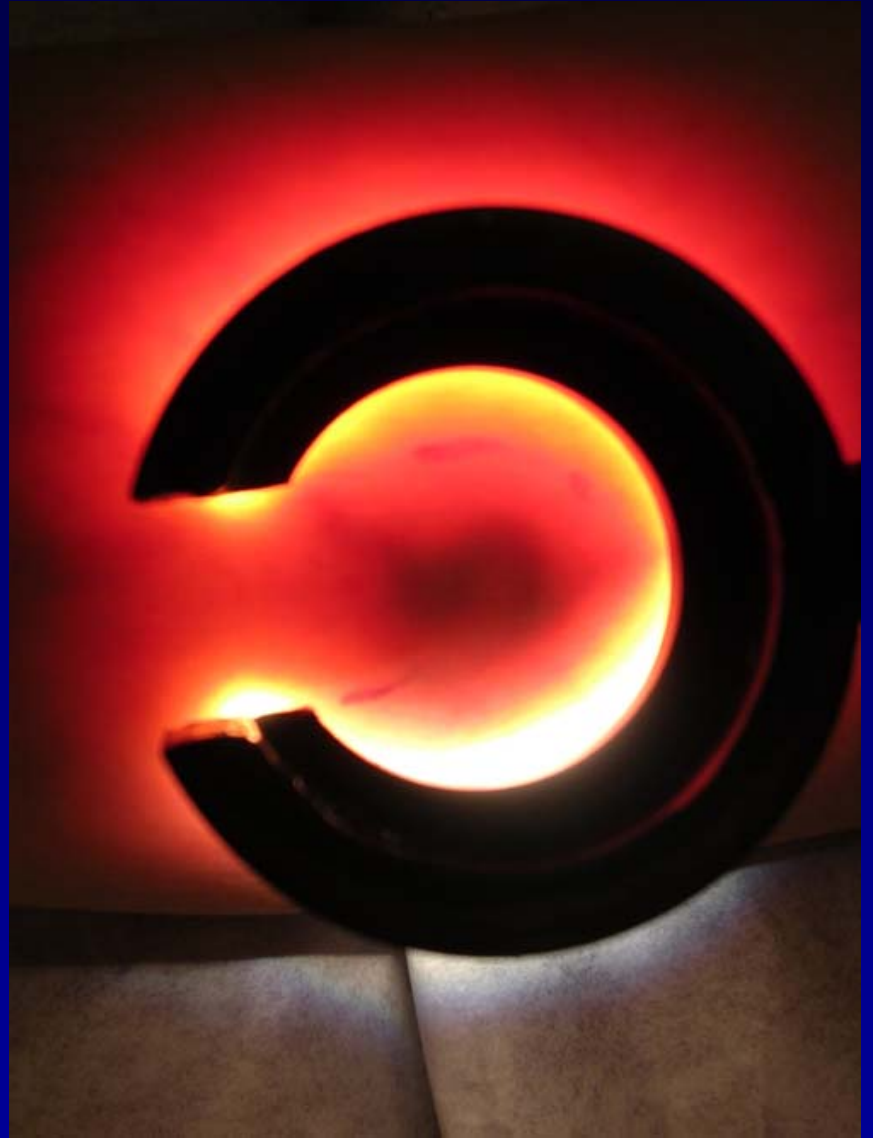


Drug delivery

- Trans-illumination -
Veinlite







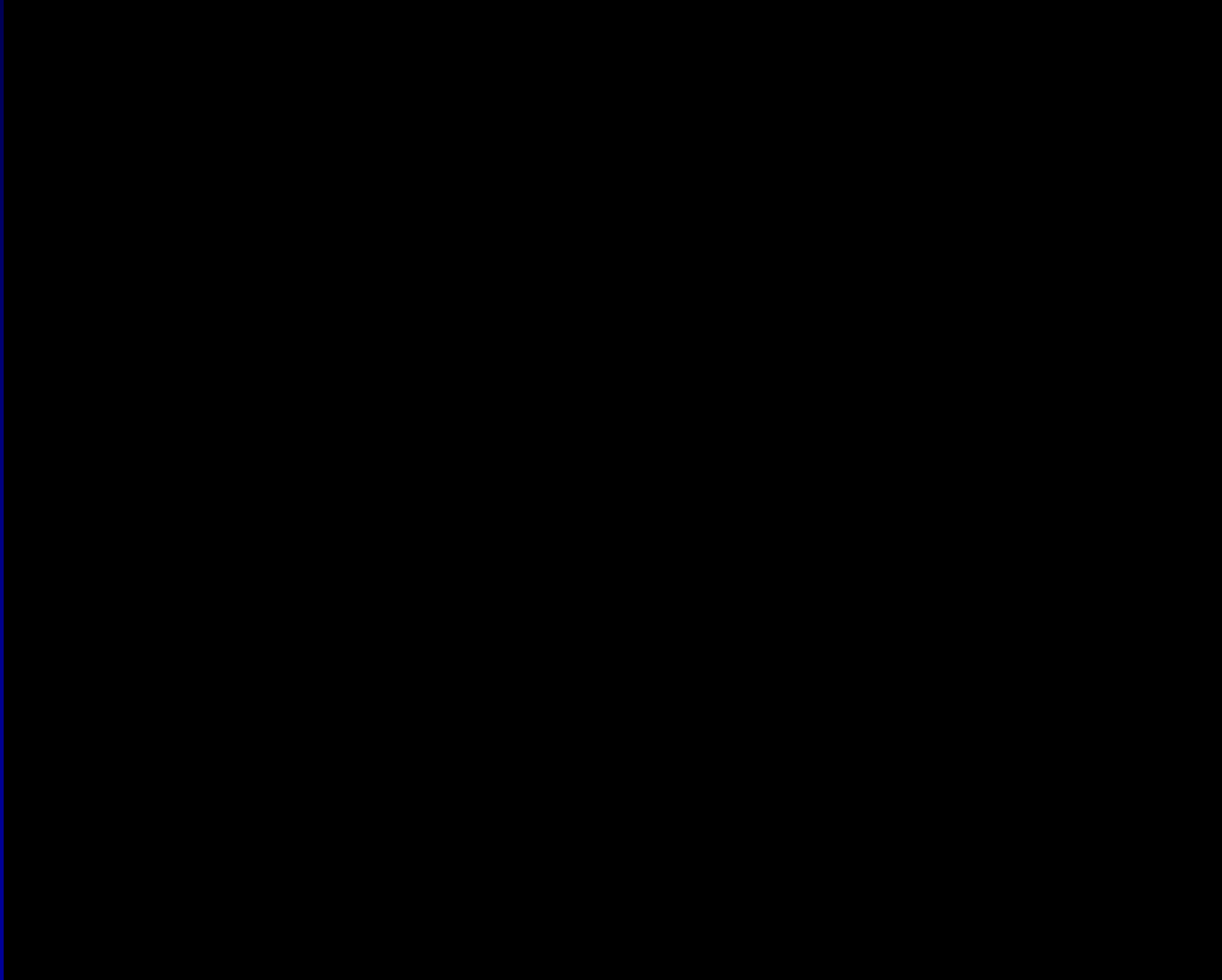
US Guided Sclerotherapy: Indications

- After EVTA
 - Sclerose incompetent tributaries close to their origins where they are not visible
- Used to treat non-truncal sources of reflux
 - Perforating veins
 - Neovascularity
- As an alternative to EVTA by some
 - Cheaper, faster, less invasive
 - Foamed sclerosants better success than with liquid

US Guided Sclerotherapy

- US guides access and assesses distribution
 - US to identify vein to be treated
 - Short axis vs. long axis to guide puncture
 - See sclerosant flow into vein
 - Easier with foam
 - Spasm occurs after injection
 - Requires practice to deliver without extravasation

Ultrasound Guided Injection

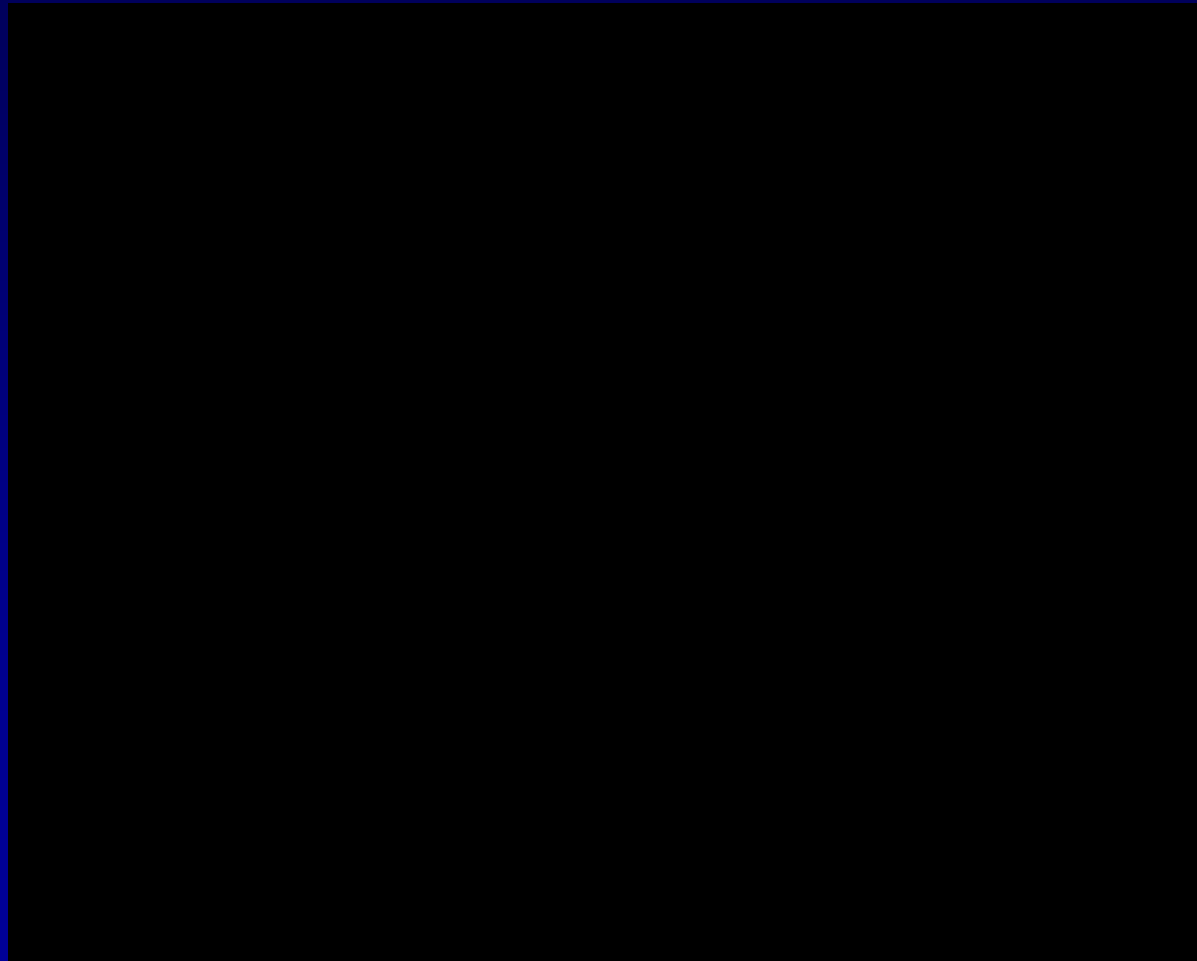


Drug delivery

- Fluoroscopy
 - Mix sclerosant with contrast
 - Injection stopped with
 - deep vein spilling
 - abnormal veins completely filled
 - Can use to ablate veins with complicated patterns
 - Neovascularizations
 - Pudendal vein varicies
 - IPV related varicies

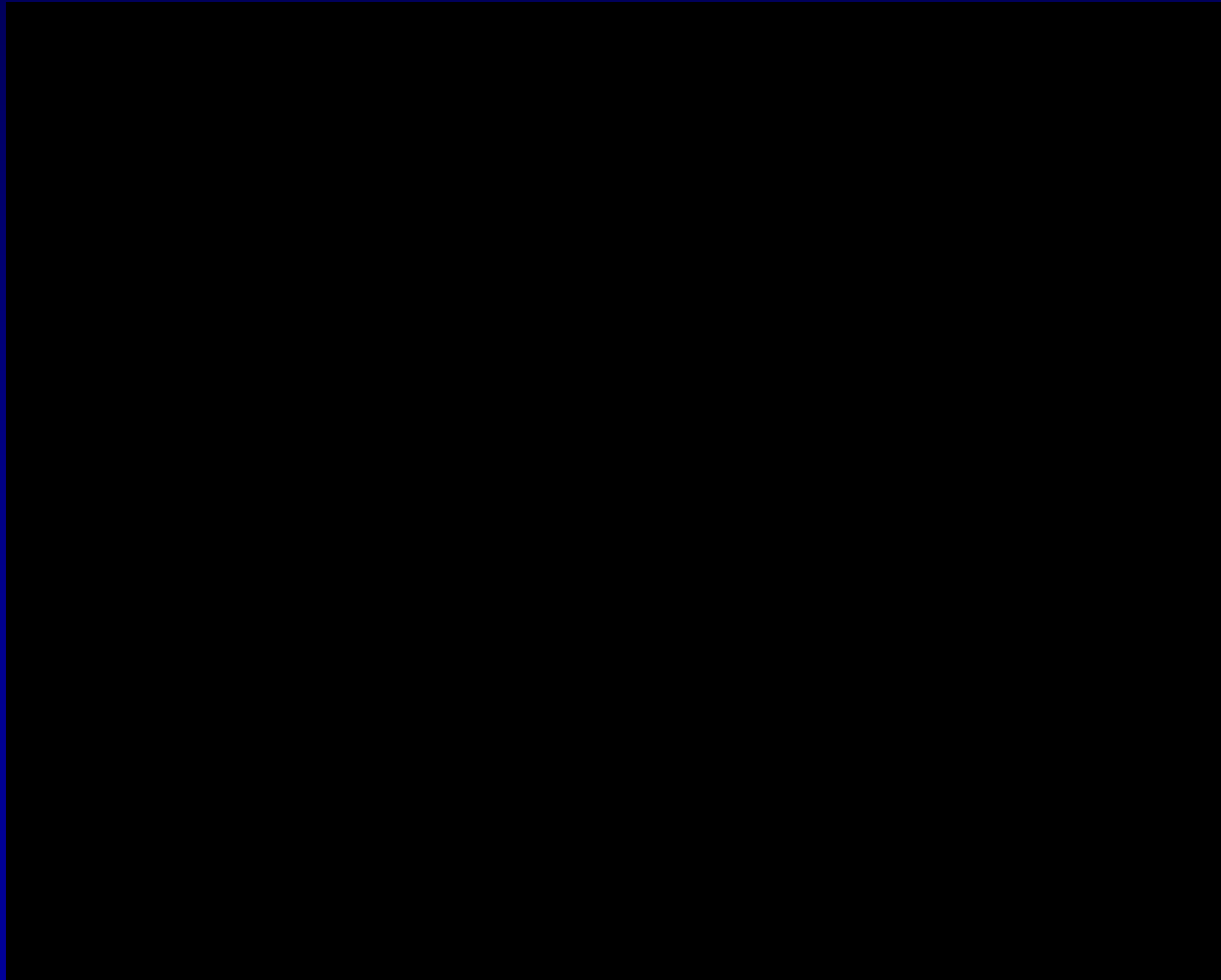
Foam Sclerotherapy:

Goal: treat neovascularity reconstituting an incompetent
GSV years after SFJ ligation



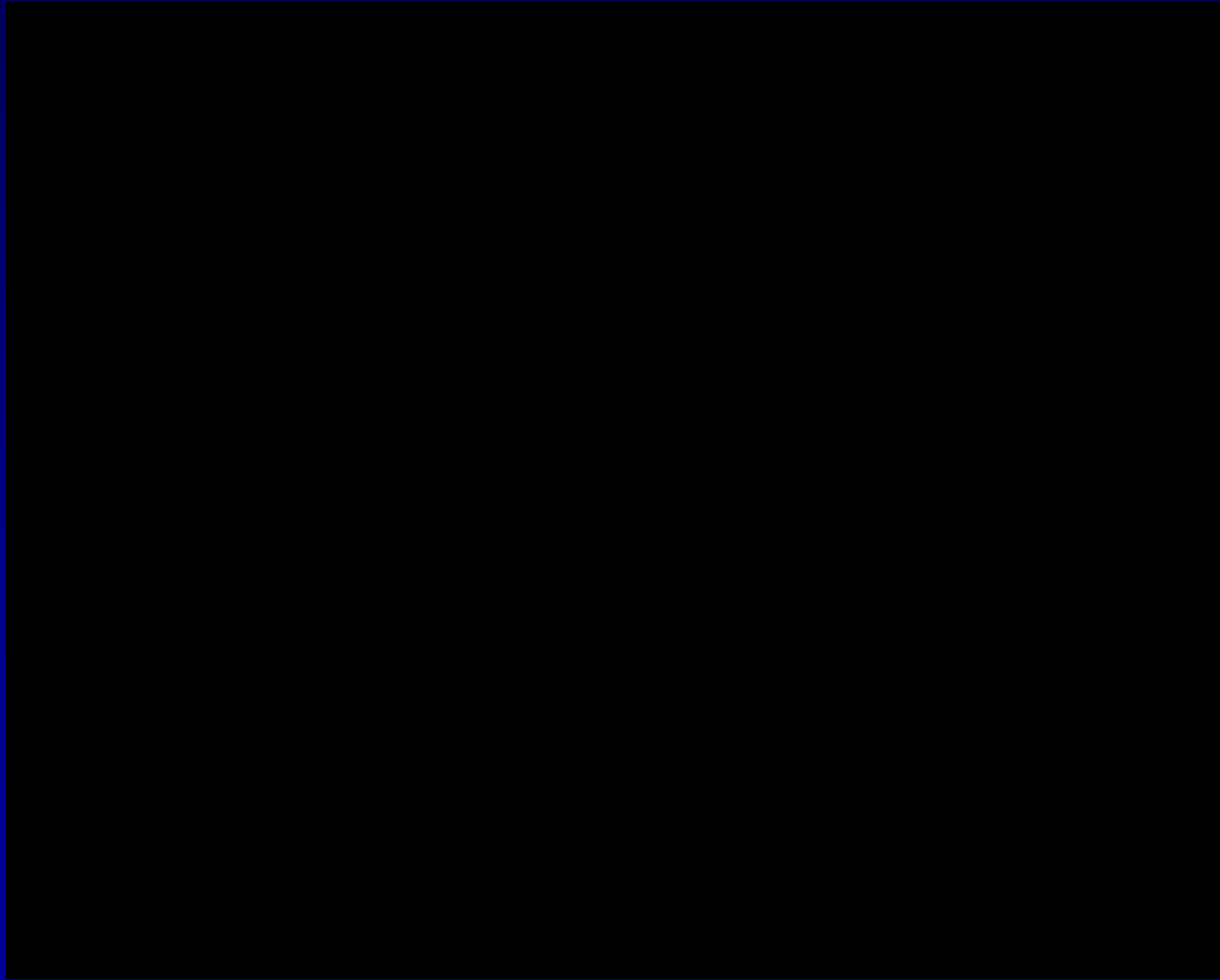
Foam Sclerotherapy:

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Foam Sclerotherapy:

Goal: treat neovascularity reconstituting an incompetent
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Foam Sclerotherapy - *Results*

	Success*	Follow-up
Endovenous Laser ¹	94%	24 months
Radiofrequency ²	90%	24 months
Foam Sclerotherapy ³	77%	22 months

*Success = elimination of saphenous vein upon duplex u/s

¹Min R, Khilnani N, Zimmet. Endovenous laser treatment of saphenous vein reflux: long-term results. *JVIR* 2003; 14: 991-96.

²Weiss RA, Weiss MA. Controlled radiofrequency endovenous occlusion using a unique radiofrequency catheter under duplex guidance to eliminate saphenous varicose vein reflux: a 2-year follow-up. *Dermatol Surg*. 2002;28:38-42.

³Barret J, Allen B, Ockelford A, Goldman M. Microfoam ultrasound-guided sclerotherapy of varicose veins in 100 legs. *Dermatol Surg* 2004;30:6-12

Foam Sclerotherapy: Higher complication rate

- Multicenter review (100 limb review)
 - Hyperpigmentation in “significant number”
 - 3 DVTs
 - 4 scotoma
 - 2 transient neurasthenia
- Commercial foam (Varisolve) (435 pt. trial)
 - DVT 2.3%
 - Gobin JP, et al. European randomized controlled trial of Varisolve PD microfoam compared with alternative therapy in the management of moderate to severe varicose veins: preliminary results. 17th UIP World Congress Chapter Meeting, 2003; San Diego, CA

Sclerotherapy- Complications

- Serious complications are rare, but include:
 - Arterial injection
 - Extravasation ulcer
 - Allergic reaction
 - Deep venous thrombosis



Sclerotherapy: Telangiectasias with Reticular Veins

Pre-treatment

Post-treatment



Sclerotherapy: Pudendal Vein Incompetence

Pre-treatment



Post-treatment



EVLT followed by Sclerotherapy

Pre-Treatment



Post-Treatment



SSV EVLT followed by Sclerotherapy

Pre-Treatment

Post-Treatment



Conclusions

- Symptoms (and appearance) are usually improved after elimination of truncal reflux
- Direct treatment of varicose veins important
 - To complete the vein elimination
 - To decrease the rate of recurrence
- Can be accomplished with Sclerotherapy or AP

Conclusions

- Most sclerotherapy utilizes direct vision
- Sclerotherapy can be extended by
 - Trans-illumination
 - US Guided injection of deeper veins
 - Deep tributaries
 - Perforating veins
 - Truncal veins
 - ? Foamed sclerosants
 - Fluoroscopy