The Fate Of Deep Veins Below the Knee After Ultrasound Guided Foam Sclerotherapy For Incompetent Venous Tributaries.

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Modern Option for Truncal Venous Incompetence
Thermal Ablation
Endovenous Laser Ablation or RFA

Major Tributary Venous Incompetence

Options for Tributary Vein Incompetence

- Phlebectomy
- (Laser)
- Ligations
- Foam Sclerotherapy-
  - Sodium Tetradecyl Sulphate (STS)
  - Polidocanol

Sclerosant Action

- STS (and polidocanol), displaces blood from vein.
- Active in the unbound state.
- Transported bound to plasma protein (inactive), catalyzed in liver.
- Mechanism of action: lysis of endothelium.
- Detergent action: protein theft denaturation.
- Time taken to destroy venous endothelium: 20s.
**Tessari technique for foam sclerosant**
Cavezzi et al. Phlebology 2002; 17:13-18

- Two plastic disposable syringes are connected by a three-way stopcock, and a filter.
- The foam is formed by mixing the liquid sclerosant (sodium tetradecyl sulphate) with 4 or 5 parts of air, through 20 passes between the two syringes.
- With the hub at a 30° rotation, passage generating high turbulence, which produces a high quality microfoam.
- Distending pressure in a bubble is inversely proportional to its radius.

**USS guided foam sclero**

- Induces fibrosis of vein/obliteration of lumen by causing inflammation of endothelial & subendothelial layers of vein wall.
- Vein punctured under USS & foam sclerosant injected.
- No RCTs comparing USGFS versus conventional surgery.

**Ultrasound Appearance of Tributary Ultrasound Guided Foam Sclerotherapy (UGS).**

**Risks of Sclerotherapy**
**Common**
- Extravasation
- Ulceration
- Inflammation
- Thrombophlebitis
- DVT?
- Pigmentation

**Uncommon (extremely rare)**
- Visual disturbances
- Chest tightness, cough
- Anaphylaxis

**Perforator Veins (PV)**
Variable Anatomy and Function

**What happens to the Deep Veins Below the Knee after sclerotherapy for tributaries and how do we treat them?**

Updated NICE guidelines reported 1/977 patient with Pulmonary embolism after UGS; www.nice.org.uk.
Deep Vein Sclerosis/Sclerosae (DVS) vs Deep Vein Thrombosis (DVT)

- Caused by Sclerotherapy.
- Usually Patent and Non-compressible Vein.
- Thrombus usually absent but may be present.
- Resolves quickly.

DVT/DVS after STS Ultrasound guided Foam Sclerotherapy

- Meticulous scanning and mapping of perforators.
- DVT 2 (0.5%)
- DVS (1 or more vessels) 90 (23.3%)
- Perforating veins (PV) identified before UGS: 27/90 (34.2%)
- PV only seen in post intervention scan: 44/90 (49%)
  - Not identified before UGS follow-up scan

STS Foam Sclerotherapy

- Total number of patients 267
- Total legs treated 386, CEAP III-VI.
- Pre-intervention duplex, marking, and identification of perforators
- Compression Stockings – 2 weeks
- LMWH for high risk patients.
- Post treatment Scan within 1 week, 2 weeks, 6 weeks, 12 weeks.

STS Foam Sclerotherapy

- Detailed list of Involved veins
  - Perforator alone 41 (1 DVS case in thigh PV)
  - Perforator and Soleal vein 2
  - Perforator and LGV 1
  - Perforator and Peroneal vein 1
  - Perforator and MGV 1
  - Peroneal vein 1
  - PTIV and MGV 1
  - PTIV and Soleal vein 2
  - PTIVs alone 10
  - Soleal vein alone 1
  - MGV alone 2
  - DVS involving tibial veins + 1 perforator 38
  - DVS involving tibial veins + 2 perforators 6
  - 24 out of 44 previously un-identified PV had DVS involving tibial veins

STS Foam Sclerotherapy

A total of 49 DVS cases (54%) involved “tibial veins”
- DVS involving tibial veins + 1 perforator: 43
- DVS involving tibial veins + 2 perforators: 6
- Median length 3 (range 1-28) cm.

DVS involved the perforator vein only in 41 patients (46%) and thought to be adequate treatment.

- Median length 3 (range 1-28) cm.

55% (24/44) previously un-identified PV had DVS involving tibial veins.

Treatment and Outcome of STS Foam Sclerotherapy

- Treatment of DVS cases involved below knee veins.
- Compression Stockings 6 weeks
- Aspirin 100mg -12 weeks
- Surveillance scanning

Outcome
- No lesions progressed.
- Unchanged 13/49: 27%
- Completely Resolved 25/49: 51%
- Smaller, 11/49: 22%
  - 2cm - 13 cm,
  - 33% - 95%.
**Post Sclerotherapy Changes in DVS are different to DVT**

- Changes are Provoked.
- Limited Duration Insult.
- Mostly low risk ambulant Patients.
- Patients generally asymptomatic.
- Vein are Non-compressible on Ultrasound but usually no thrombus noted.
- ? Surveillance scanning if identified.

**Conclusion**

- Deep Vein Sclerosae (DVS) occurs in almost 25% of patients having ultrasound guided foam sclerotherapy.
- Lesions are of short length.
- The course of these lesions appears fairly benign, and are adequately treated with stockings and aspirin.
- The majority of DVS (73%) resolved or decreased in length within 6-12 weeks, and no lesions progressed.

Thank you