2023 MID-ATLANTIC CONFERENCE

11th ANNUAL CURRENT CONCEPTS IN

VASCULAR THERAPIES

2023

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I Have Varicose Veins; My Mom Had Varicose Veins: What should I Expect, and When Should I Seek Care?

Christopher Murter, MD

Varicose Veins

- Defined as “subcutaneous veins in the lower extremities which are dilated to > 3mm in diameter in the upright position.
  - Commonly occur in axial superficial veins (GSV/SSV/AASV) and/or their tributaries

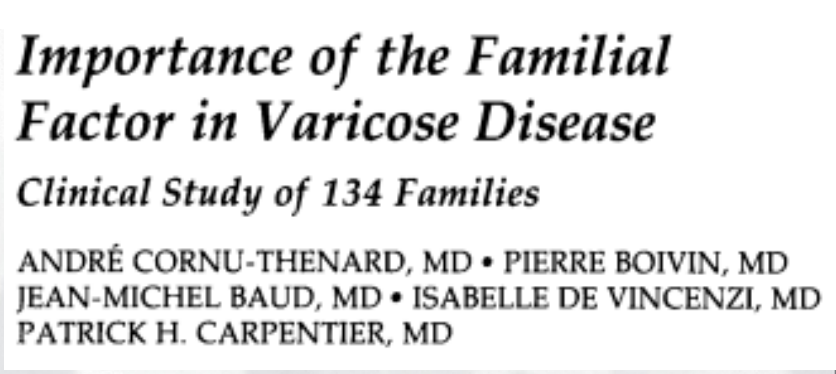
Risk Factors

- Pregnancy
- Prolonged standing
- Females
- Prior DVT (Post-Thrombotic)
- Trauma
- Aging

- Heredity?

- Prospective study of 402 patients and their risk of developing varicose veins:
  - 90% if both parents have VVs
  - 62% of females if one parent has VVs
  - 25% of males if one parent has VVs
  - 20% if parents do NOT have VVs

Suggests autosomal dominant trait with variable penetrance



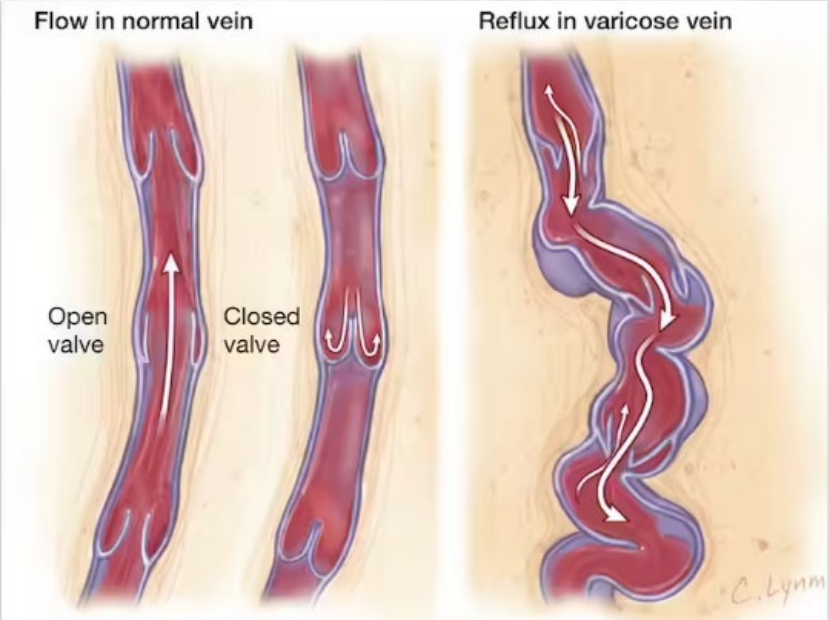
Importance of the Familial Factor in Varicose Disease

Clinical Study of 134 Families

ANDRÉ CORNU-THENARD, MD • PIERRE BOIVIN, MD
JEAN-MICHEL BAUD, MD • ISABELLE DE VINCENZI, MD
PATRICK H. CARPENTIER, MD

Pathophysiology

- Primary venous disease occurring as a result of structural weakening of the vein wall
- Valvular incompetence is typically present, though not obligatory
- Progressive disease
  - Pregnancy is the exception



Symptoms

- Presence/severity of symptoms does NOT correlate with size or severity of VVs present
- Heaviness, tiredness, aching, burning, throbbing, itching, cramping
  - Typically worse with prolonged sitting/standing
    - Premenstrual exacerbation of symptoms is common
  - Improved with leg elevation or walking
- Symptoms are NOT specific, and can be due to or overlap with a variety of rhematologic or orthopedic pathologies
  - Relationship with lower extremity movement and compression therapy can help establish venous etiology

Natural History

- Chronic Venous Insufficiency affects 1/3 of the adult population in western society
  - Progressive disease, though at variable rates resulting in:

When an problem gets worse: Stasis Dermatitis and Dermal Fibrosis

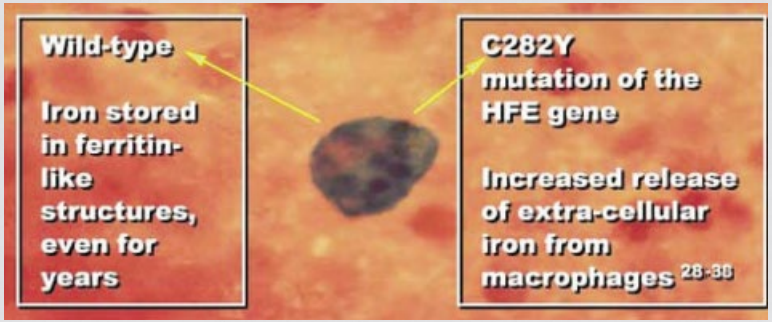
- Stasis Dermatitis: chronic dermal inflammation due to sustained injury caused by venous hypertension
  - Extravasation of macromolecules and RBC products into dermal interstitium -> secondary inflammatory response.
  - Clinically: results in brawny induration, skin thickening, swelling, and ultimately tissue breakdown/ulceration
    - Results from skin hypoxia – tcPO2 can differ by more than 20mm compared to control limb.

Why do some patients with similar venous disease develop ulcers and others don't?

- Iron metabolism and ulcer development are interrelated:
  - Iron deposition itself may cause tissue damage

Hemochromatosis C282Y gene mutation increases the risk of venous leg ulceration

Paolo Zamboni, MD,* Silvia Tognazzo, BS, Marcello Izzo, MD, Francesca Pancaldi, MD, Gian L. Scapoli, MD, Alberto Liboni, MD, and Donato Gemmati, BS *Ferrara, Italy*



Primary CVD (n = 196)		
HFE C282Y	*Ulcer (n = 98)*	*No ulcer (n = 98)*
CC (n = 182)	86 (47.2%)	96 (52.8%)
CY + YY (n = 14)	12 (85.7%)	2 (14.3%)
OR (95% CI; *P*)	6.69 (1.45-30.8; .01)	

When to seek care?

- Symptoms affecting lifestyle or quality of life (C1,C2)
- Significant lower extremity swelling (C3)
- Skin changes: stasis dermatitis, fibrosis, lipodermatosclerosis, atrophie blanche (C4)
- Ulceration (C5, C6)

Evaluation

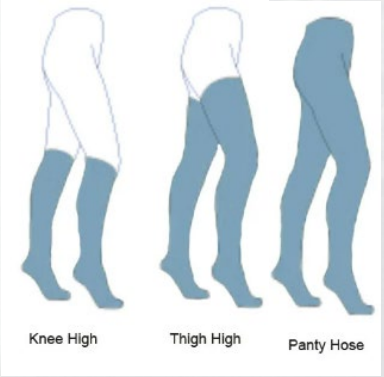
- History
  - Symptoms, relevant med/surg history (DVT, CHF, trauma, bypass surgery, radiation)
- Examination
  - Thorough lower extremity exam, document presence of wounds or skin changes, varicose veins, telangectasias, peripheral pulses, abdominal exam

Initial Therapy: Nonoperative

- Lifestyle Modification:
  - Exercise
  - Leg Elevation: Above the level of the heart several times per day
  - Weight loss
- Compression therapy
  - Esssential fot the care of all patients with C2-C6 disease
  - Can improve the venous pump function, improve cutaneous microcirculation, oxygenation, lymphatic drainage

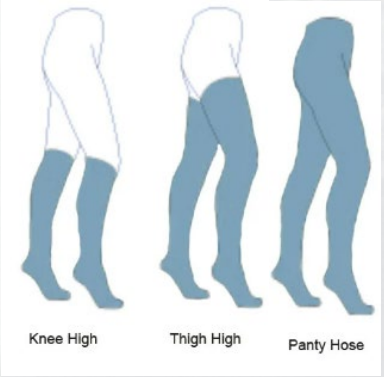
Compression Therapy

- Gradient Elastic Stockings
  - 4 Strengths:
    - 10-20 mmHg
    - 20-30 mmHg
    - 30-40 mmHg
    - 40-50 mm Hg



Compression Therapy

- Gradient Elastic Stockings
  - 4 Strengths:
    - 10-15 mmHg
    - 20-30 mmHg
    - 30-40 mmHg
    - 40-50 mm Hg

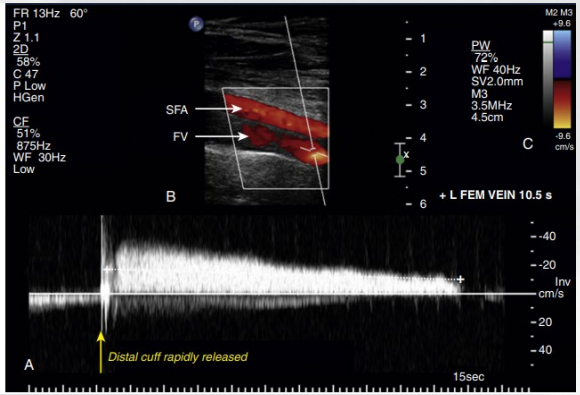


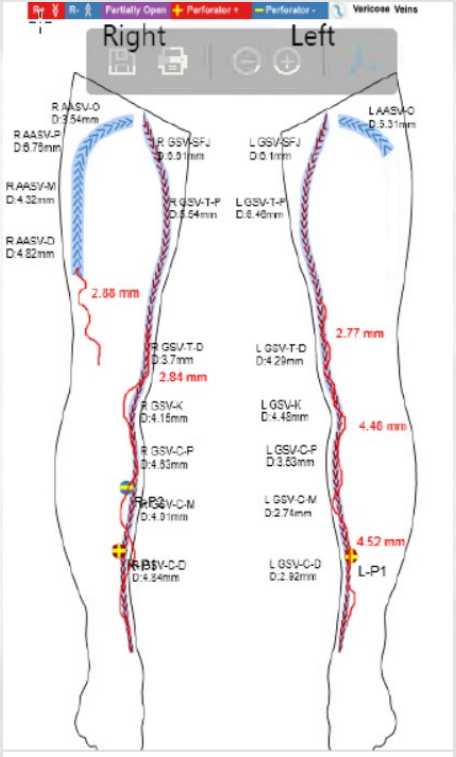
Compression Therapy

- CircAids:
- Unna Boot: Multilayered compression bandage
  - Inner gauze bandage impregnated with zinc oxide
  - Outer layer of elastic wrapping exerting graded compression
  - Stiffens with drying, improving venous return with ambulation

Imaging

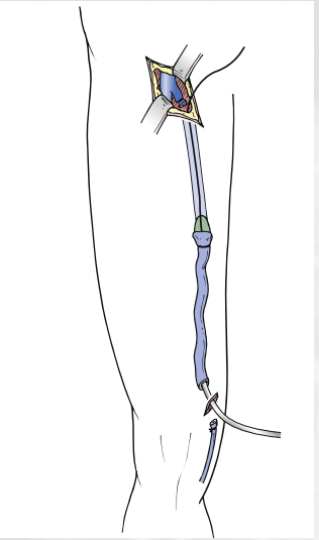
- Duplex Ultrasound
  - Venous Duplex: Rule out DVT
  - Insufficiency Study:

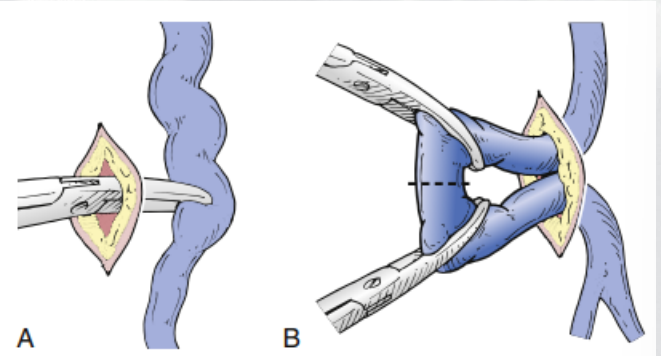




Surgical Treatment

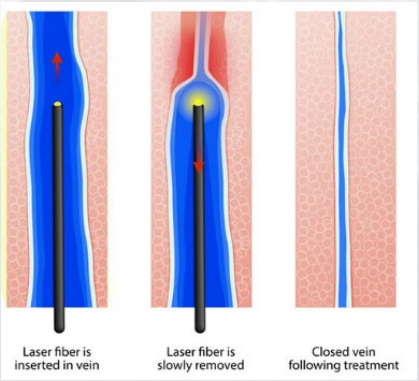
- High ligation and stripping is the classic operation for treatment of VV and related reflux
  - Shown to reduce VCSS scores at 6 and 12 months
  - Incompetent accessory saphenous veins should be addressed at the same time
- Phlebectomy
  - Small 1-3mm stab incisions to remove VV tributaries
  - Can require in excess of 20 incisions





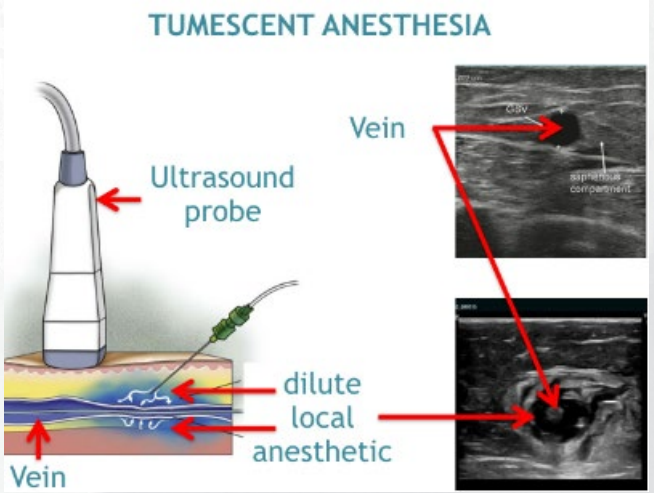
Thermal Ablation Techniques

- Radiofrequency Ablation (RFA)
  - Ablates vein using radiofrequency energy at 7cm intervals causing fibrosis
  - 92.6% and 91.9% ablation rates at 3 and 5 years, respectively
  - VCSS improvement from 3.9 – 0.9 and 1.3 at 3 and 5 years
- Endovenous Laser Ablation (EVLA)
  - Higher wavelengths (1470nm, e.g.) typically used due to lower rates of pain and bruising
  - 98.2% initial and 93.4% ablation rate at 2 years



Thermal Ablation Techniques

- All require tumescent anesthesia
  - Dilue solution of local anesthetic (lidocaine) with epinephrine and bicarbonate
    - i.e. 50cc 1% lidocaine w/ epi + 5cc 8.4% sodium bicarbonate in 450cc 0.9% saline

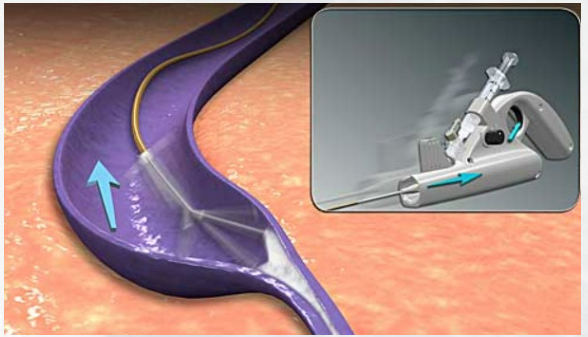


Non-Thermal/Non-Tumescent (NTNA) Ablation Techniques

- Foam
  - Tessari method (physician-compounded foam)
    - 60-95% successful ablation rate
  - Varithena (FDA approved, pre-compounded polidocanol)
    - 85% 1 year ablation rate

Non-Thermal/Non-Tumescent (NTNA) Ablation Techniques

- Mechanicocehmical Ablation (ClariVein)
  - Catheter with rotating wire that causes mechanical damage to the endothelium with sclerosant dispersion
  - LAMA trial: Ablation rates better with EVLA (91% vs 77% at 1 year)
- Adhesive Closure (Venaseal)
  - Cyanoacrylate glue
  - Morrison, et al: RCT RFA vs Venaseal: 94% closure rate at 2 years, equivalent to RFA
  - 6% Type IV hypersensitivity reaction rate



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Comparison

Endovenous therapies of lower extremity varicosities: A meta-analysis

Renate van den Bos, MD,[a] Lidia Arends, PhD,[b,c] Michael Kockaert, MD,[a]
Martino Neumann, MD, PhD,[a] and Tamar Nijsten, MD, PhD,[a] *Rotterdam, The Netherlands*

- Meta-Analysis of over 12,000 limbs treated

Table II. The pooled proportion of patients with anatomical successful outcome after different time intervals

	3 months		*1 year*		*3 year*		*5 year*	
Type of intervention	*Success rate (%)*	*95% CI*	*Success rate (%)*	*95% CI*	*Success rate (%)*	*95% CI*	*Success rate (%)*	*95% CI*
Surgery	80.4	72.3-86.5	79.7	71.8-85.8	77.8	70.0-84.0	75.7	67.9-82.1
UGFS	82.1	72.5-88.9	80.9	71.8-87.6	77.4	68.7-84.3	73.5	62.8-82.1
RFA	88.8	83.6-92.5	87.7	83.1-91.2	84.2	75.2-90.4	79.9	59.5-91.5
EVLA	92.9	90.2-94.8	93.3	91.1-95.0	94.5	87.2-97.7	95.4	79.7-99.1

CI, Confidence intervals; *EVLA*, endovenous laser ablation; *RFA*, radiofrequency ablation; *UGFS*, ultrasound guided foam sclerotherapy.

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Comparison

Randomized clinical trial comparing endovenous laser ablation, radiofrequency ablation, foam sclerotherapy and surgical stripping for great saphenous varicose veins

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Table 2 Failure rates up to 1 year after treatment of varicose veins

	EVLA	RFA	UGFS	Stripping	*P**
3 days	0 (0)	0 (0)	3 (2·1)	4 (2·8)	0·053
1 month	1 (0·7)	0 (0)	2 (1·4)	3 (2·2)	0·202
1 year	7 (5·8)	6 (4·8)	20 (16·3)	4 (4·8)	< 0·001

Table 3 Complications in the first month after treatment of varicose veins

	EVLA	RFA	UGFS	Stripping
Major				
Deep vein thrombosis	0	0	1*	1
Pulmonary embolism	0	0	1*	0
Minor				
Phlebitis	4	12	17	5
Infection	0	1	4	1
Paraesthesia	3	6	2	5
Hyperpigmentation	3	8	8	6
Haemorrhage	1	0	1	1

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TABLE 154.1 Varicose Vein Guidelines

Number	Guideline	Strength of Recommendation	Quality of Evidence
9.1	We suggest compression therapy using moderate pressure (20–30 mm Hg) for patients with symptomatic varicose veins.	2	C
9.2	We recommend against compression therapy as the primary treatment of symptomatic varicose veins in patients who are candidates for saphenous vein ablation.	1	B
9.3	We recommend compression as the primary therapeutic modality for healing venous ulcers.	1	B
11.2	Because of reduced convalescence and less pain and morbidity, we recommend endovenous thermal ablation of the incompetent saphenous vein over open surgery.	1	B
10.1	For treatment of the incompetent great saphenous vein, we suggest high ligation and inversion stripping of the saphenous vein to the level of the knee.	2	B
10.3	For treatment of small saphenous incompetence, we recommend high ligation of the vein at the knee crease, about 3 to 5 cm distal to the saphenopopliteal junction, with selective invagination of the incompetent portion of the vein.	1	B
10.7	We recommend ambulatory phlebectomy for treatment of varicose veins performed with saphenous vein ablation, either during the same procedure or at a later stage. If general anesthesia is required for phlebectomy, we suggest concomitant saphenous ablation.	1	B
10.5	We suggest that preservation of the saphenous vein using the ambulatory conservative hemodynamic treatment of varicose veins (CHIVA) technique be used only selectively in patients with varicose veins and only when performed by trained venous interventionists.	2	B
10.6	We suggest that preservation of the saphenous vein using the ASVAL under local anesthesia procedure be used only selectively in patients with varicose veins.	2	C

Conclusions

- Chronic Venous Insufficiency is a spectrum of disease of varying severity
- Typically a progressive disease, though at varying rates
- Duplex ultrasound is the mainstay of diagnostic evaluation
- Treatment is initially conservative with compression therapy
- Multiple effective and safe, minimally invasive treatment options are available

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Thank You!

- Questions?

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