

# INTERVENTIONAL MANAGEMENT OF VENOUS DISEASE

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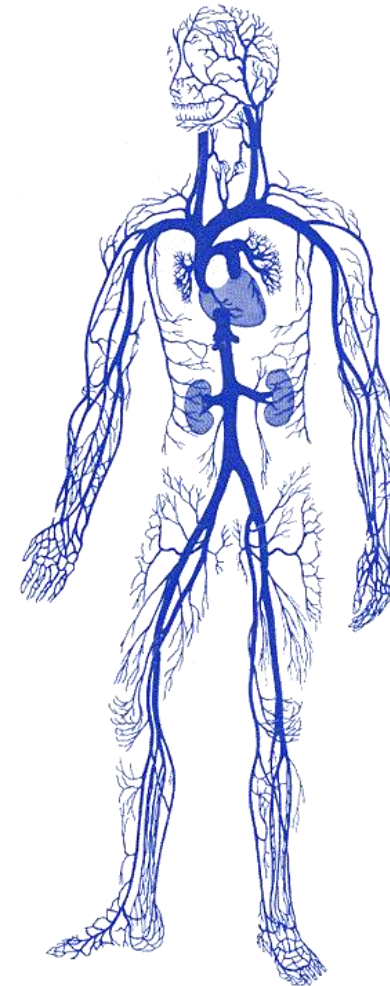
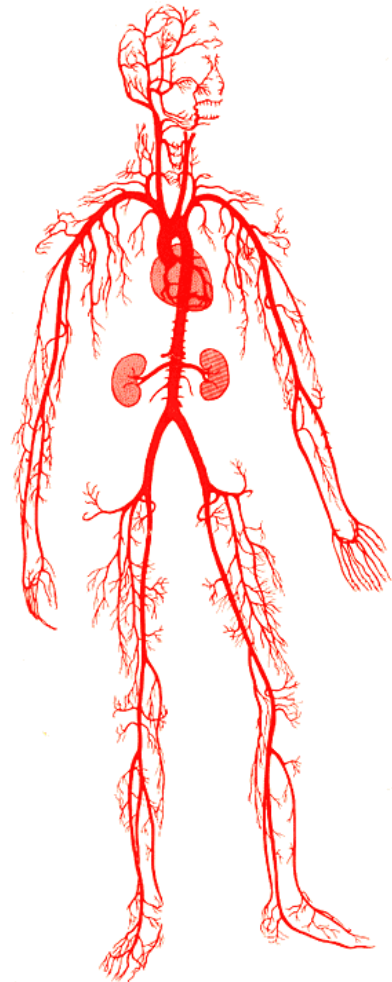
PRESIDENT, FOUNDER

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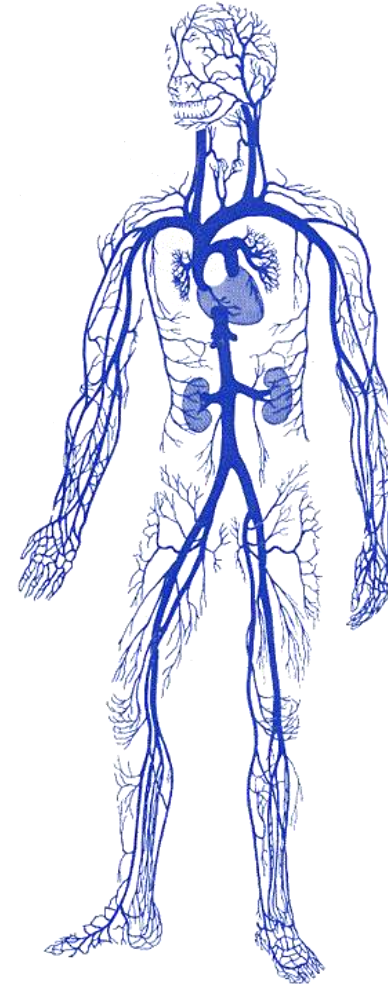
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# Chronic Venous Insufficiency and Varicose Veins



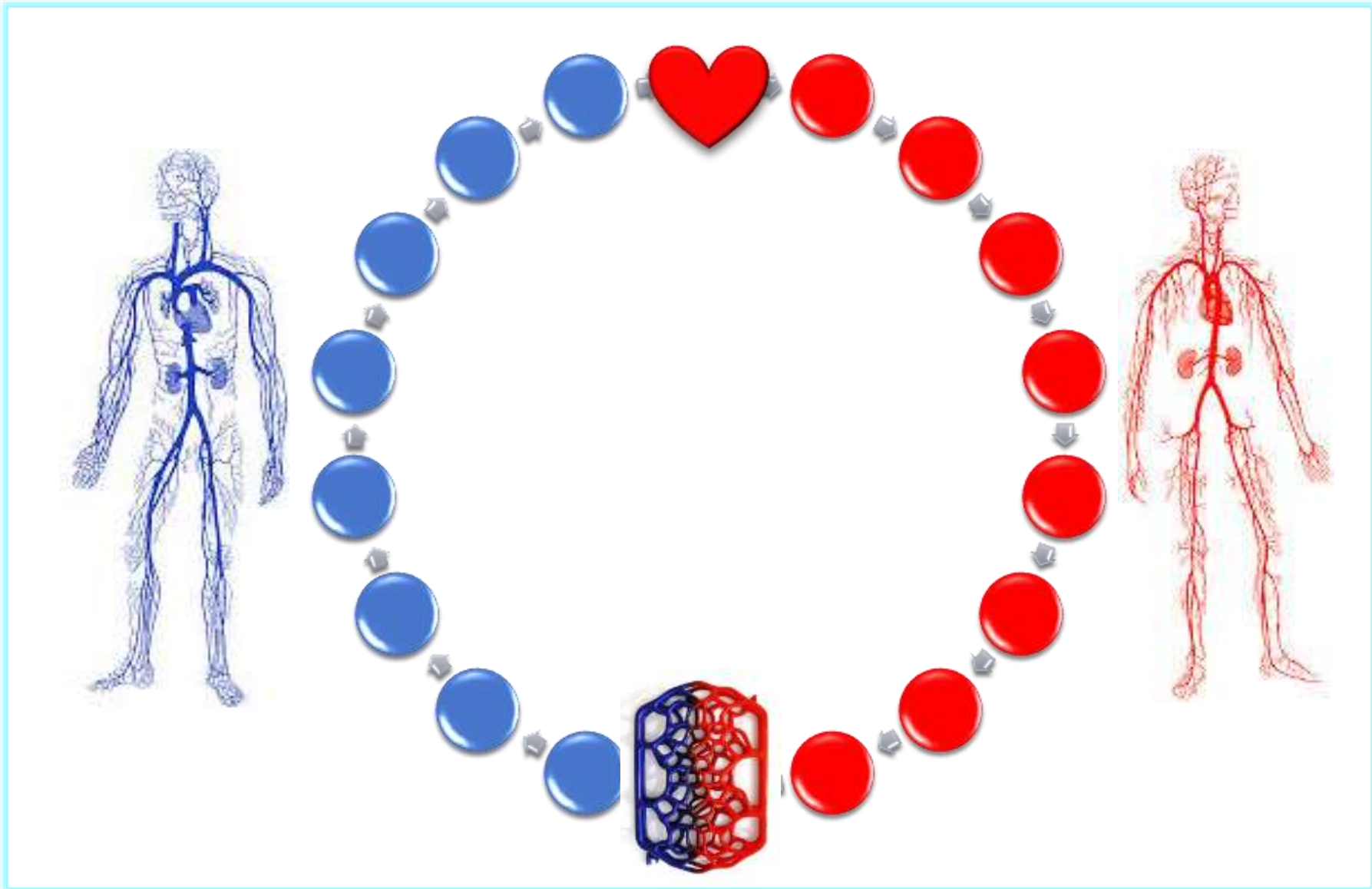
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# Venous Insufficiency

The Most Prevalent Vascular Disorder

The Most Ignored Vascular Disorder

The Most Misdiagnosed Vascular Disorder



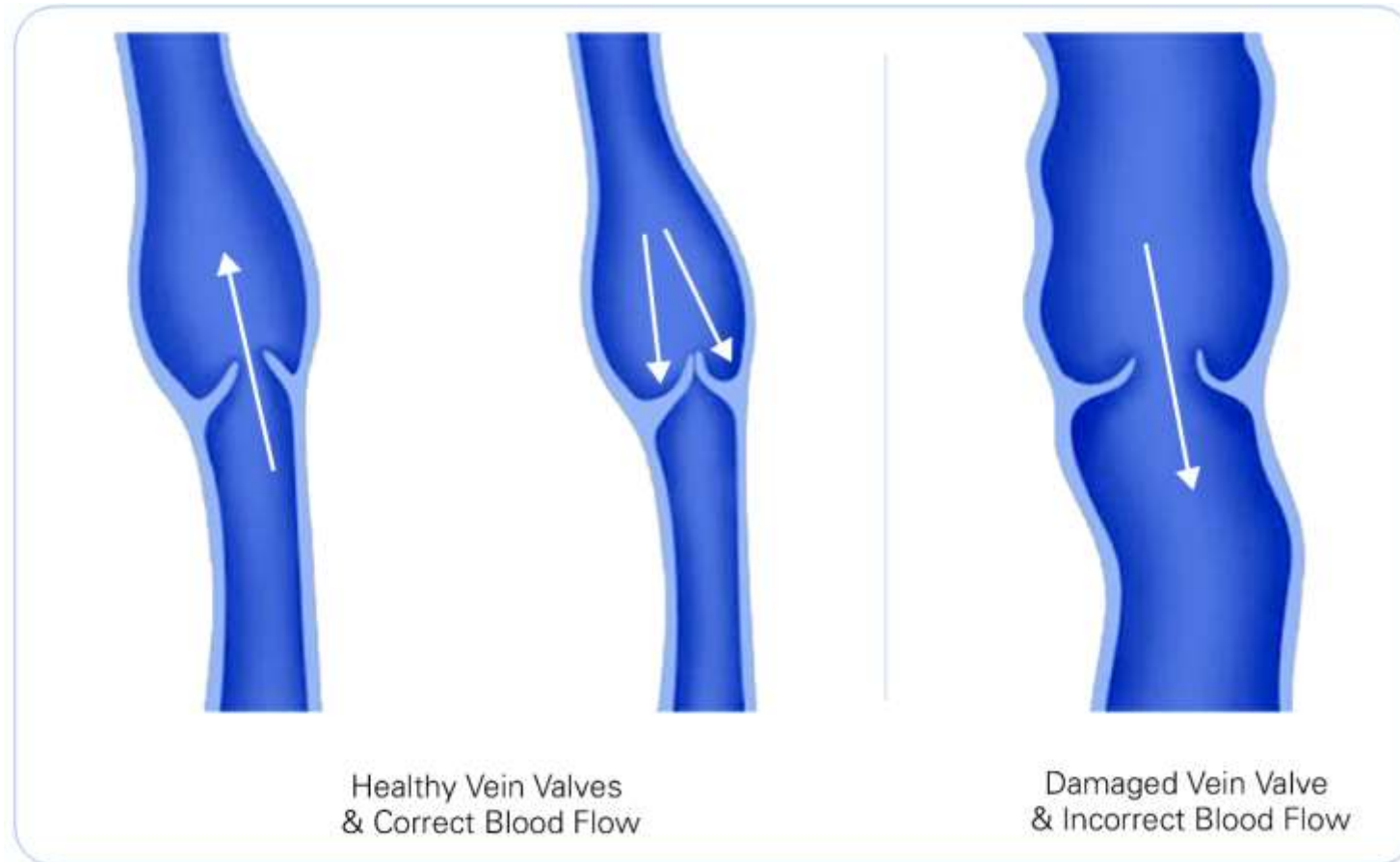
# VENOUS PUMP

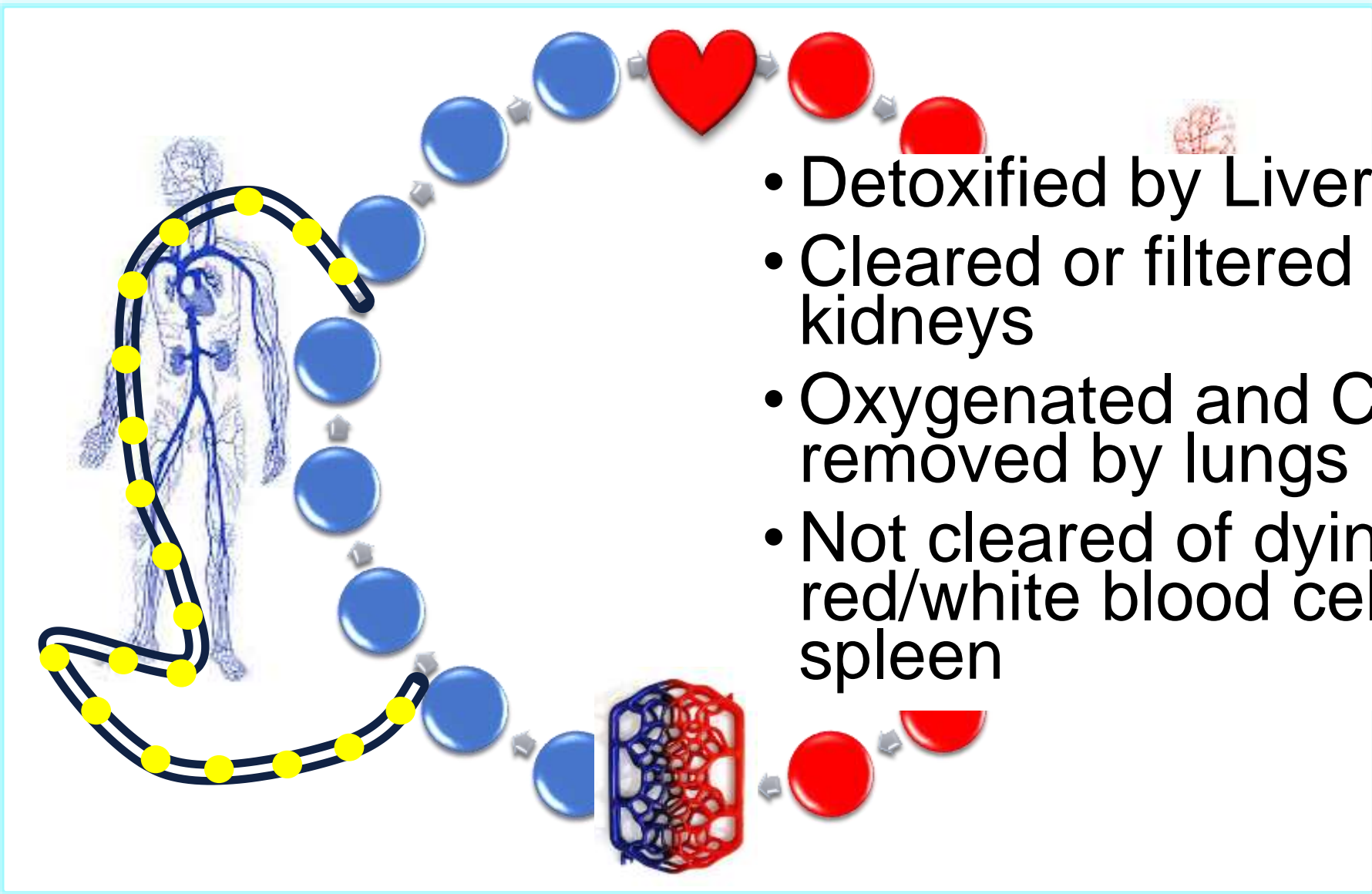


Blood return to the heart

- Muscle contraction
- Inspiration

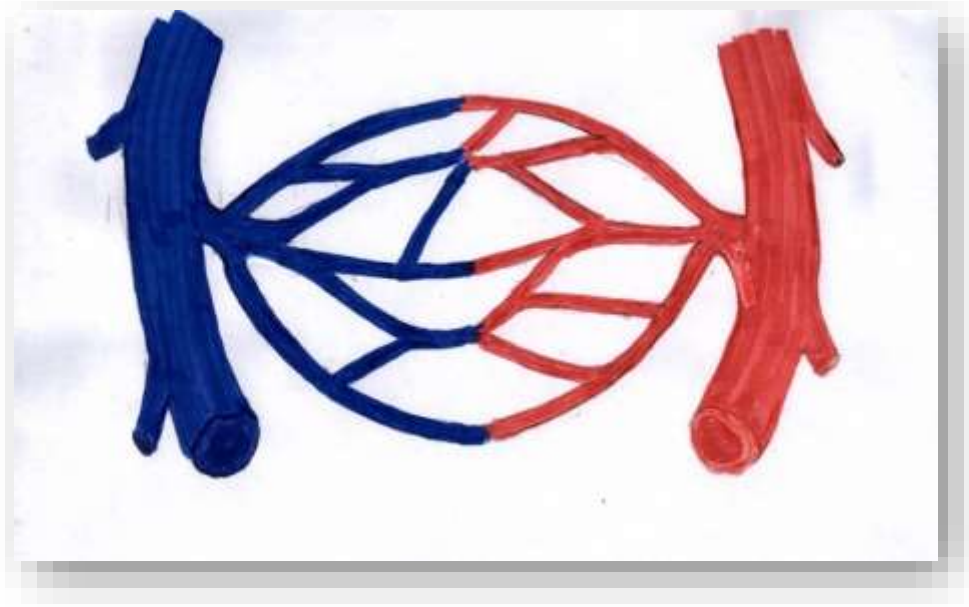
# PATHOPHYSIOLOGY OF VENOUS INSUFFICIENCY





- Detoxified by Liver
- Cleared or filtered by kidneys
- Oxygenated and CO<sub>2</sub> removed by lungs
- Not cleared of dying red/white blood cells by spleen





- Venous Hypertension
- Leukocyte Trapping
- Release of Proteolytic Enzymes
- Destruction of CBM
- Leakage of Plasma Proteins
- Tissue Hypoxia
- Dermatitis & Lipodermatosclerosis

# MANIFESTATIONS OF VENOUS INSUFFICIENCY

**Varicose Veins**



**Swollen Legs**



**Skin Changes**



**Skin Ulcers**



Photos courtesy of Rajabrata Sarkar, MD, PhD.

# NEARLY 40 MILLION PEOPLE SUFFER FROM VENOUS REFLUX DISEASE AND VARICOSE VEINS



# INTERVENTIONAL TREATMENT FOR VENOUS INSUFFICIENCY

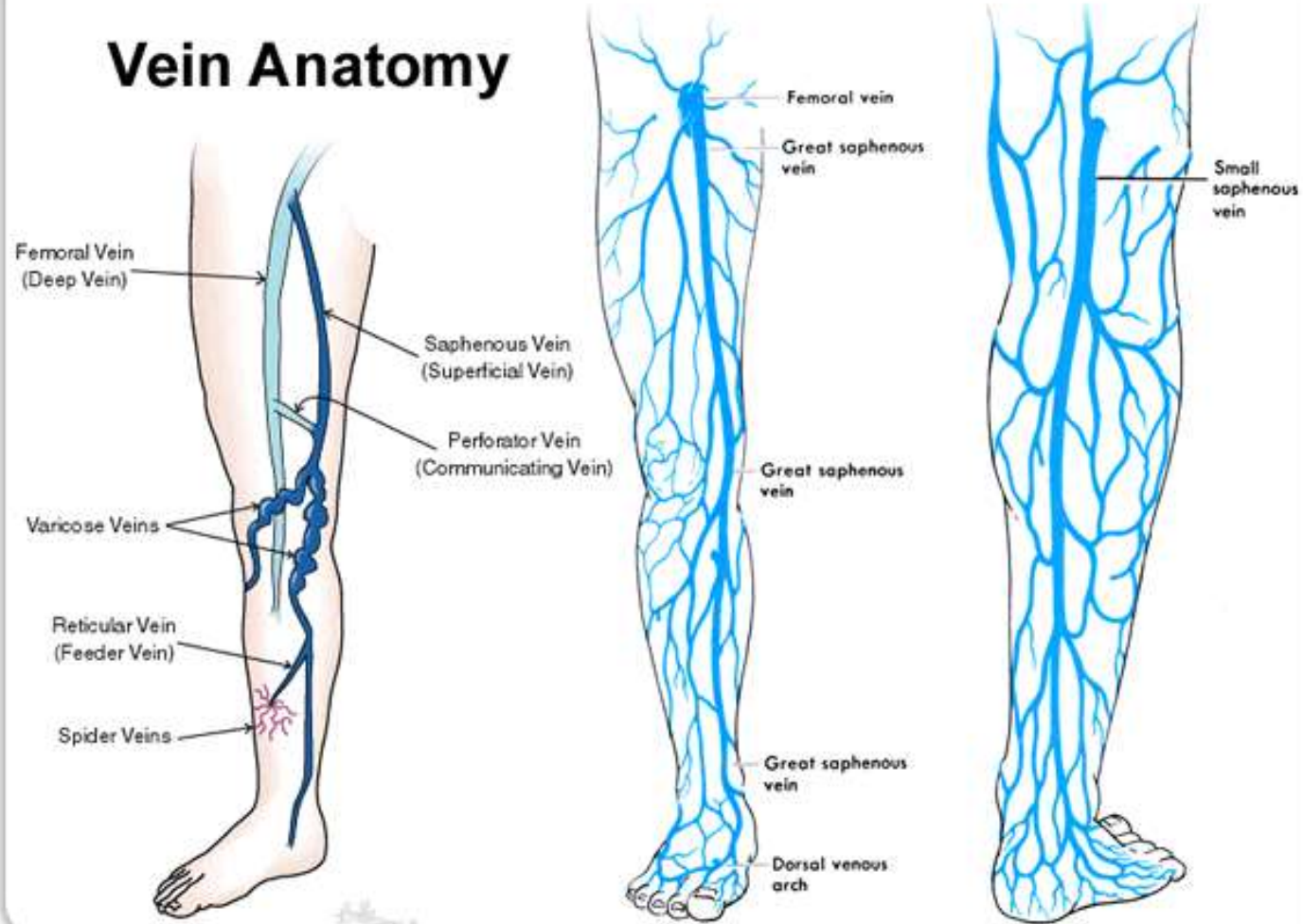
# SURGICAL INTERVENTION

- Archaic
- Barbaric
- Obsolete

# ENDOVASCULAR TECHNIQUES

- Requires extensive knowledge of anatomy and physiology as well as venous pathology
- Office Based
- Local Anesthetic
- Chemical or heat ablation of culprit vessel
- NO Down Time
- Covered by most insurance plans

# Vein Anatomy



# RADIOFREQUENCY ABLATION

- FDA approved in 1999
- First generation “Closure Plus”
- 6 or 8 French



# CLOSURE FAST, 2007



Disposable catheter  
inserted into vein



Vein warmed  
and collapses



Catheter withdrawn,  
closing vein

# CLOSURE FAST EFFICACY 3 YEAR DATA: PROEBSTLE: JVS 2011

- 295 treated veins
- 93% successful closure at 3 years
- NO DVTs!

Journal of  
**Vascular  
Surgery**

Volume 38

Number 2

August 2003

Prospective randomized study of endovenous  
radiofrequency obliteration (Closure procedure)  
versus ligation and stripping in a selected patient  
population (EVOLVE Study)

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Nancy and Grenoble, France; Merrittown, NJ; and Graz, Austria

**Purpose:** This study was designed as a prospective, multicenter randomized comparison of procedure-related complications, patient recuperation, and quality-of-life outcomes between patients undergoing vein stripping with high ligation and patients undergoing great saphenous vein (GSV) obliteration with temperature-controlled radiofrequency ablation without adjunctive high ligation (Closure procedure).

**Methods:** Eighty-five patients (86 limbs) from five sites (France, 3; Austria, 1; United States, 2) were randomly allocated to undergo radiofrequency obliteration (RFO) or stripping and high ligation (SHL). Final analysis included data for 44 limbs in the RFO group and 36 limbs in the SHL group. Follow-up examinations were performed at 72 hours, 1 week, 3 weeks, and 4 months. All patients completed the CIVIQ2 quality-of-life (QOL) questionnaire and underwent clinical and ultrasound examinations at each follow-up visit.

**Results:** Immediate success on the day of treatment was reported for 95% (42 of 44) of limbs in the RFO group and 100% (36 of 36) of limbs in the SHL group. In seven RFO limbs (16.3%) a scan obtained 72 hours after the procedure showed flow in the proximal GSV. Five of these segments had reflux in the open segment. At 1 week two of these closed, and an additional segment closed at 3 weeks. In no cases did flow reappear after complete occlusion of the GSV. Time to return to normal activities was significantly less in the RFO group (mean, 1.15 days; 95% confidence interval [CI], 0.05-2.34) compared with the SHL group (mean, 3.89 days; CI, 2.67-5.12;  $P = .02$ ). In the RFO group, 80.5% of patients returned to routine activities of daily living within 1 day, compared with 46.9% of patients in the SHL group ( $P < .01$ ). Patients in the RFO group were able to return to work in 8.7 days (CI, 1.16-8.17), compared with 12.4 days (CI, 8.66-16.23) for the SHL group ( $P < .05$ ). Analysis of the QOL surveys showed statistically significant differences in favor of the RFO group for global score and pain score during follow-up. The magnitude of the difference, however, progressively decreased between 1 week and 4 months.

**Conclusions:** In the absence of significant complications, such as deep vein thrombosis and pulmonary embolism, severe neuritic sequelae, and skin burns, there are significant early advantages to endovascular obliteration of the GSV compared with conventional vein stripping. (J Vasc Surg 2003;38:207-14.)

Conventional management of the incompetent saphenous vein in patients with symptomatic varicose veins is

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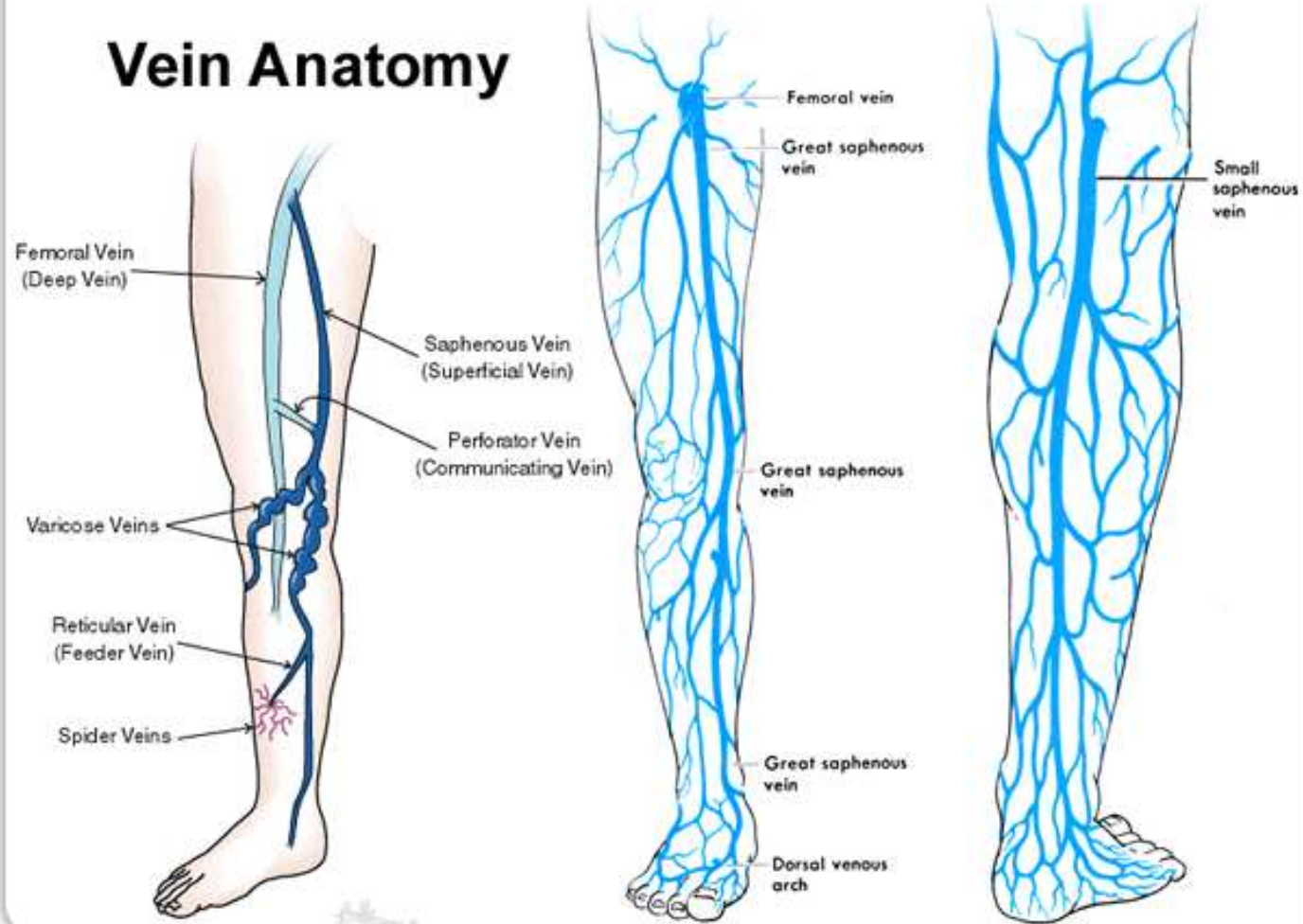
doi:10.1016/S0741-3214(03)00238-3

generally believed to be best treated with removal of the saphenous vein from the saphenofemoral junction to the level of the knee or below, along with individual ligations of the saphenous branches in the groin. Ligation and stripping is the standard treatment for varicose veins, with the highest rate of initial success and lowest rate of recurrence.<sup>1,2</sup> Any alternative technique to high ligation and stripping of the saphenous vein must have the same or better outcome, ideally without the associated morbidity. A new approach to management of saphenous vein reflux is endovascular obliteration of the vein with a radiofrequency-generated heating probe placed through a percutaneous puncture or mini-incision in the calf. This is known as the Closure procedure (VNUS Medical Technologies, San Jose, Calif).<sup>3,4</sup> We present early results of a comparative study of

## EVOLVES (FIVE YEAR DATA)

- Multicenter prospective data on over 1000 patients studied proved closure rates of 88%

# Vein Anatomy



# VARICOSE VEINS POST ABLATION

- Live with it if no further sx after ablation
- Painful varicose veins
- Removed for cosmetic purposes

# ADJUNCTIVE THERAPY

- Tributaries of the ablated vessel still pose a problem whether symptomatic and or cosmetic
- Adjunctive therapy includes foam sclerotherapy and microphlebectomy

# MICROPHLEBECTOMY

- Outpatient procedure involving no sedation and only local anesthetic / tumescent
- Objective is to micro-surgically remove varicose branches
- Important to emphasize to patient that these branches are not normal structures
- Procedure is usually 15 to 30 minutes and is completely ambulatory
- Chosen over other adjunctive treatments as a more definitive form of varicose vein elimination



# MICROPHLEBECTOMY

- Procedure involves identifying the vessel visually by the pt, the care provider and performing a scout u/s to assure no significant direct reflux from the deep.
- Vein is then mapped
- Sterile prep including sterile setup and drape
- Tumescant anesthesia directly under the skin with pump infiltration



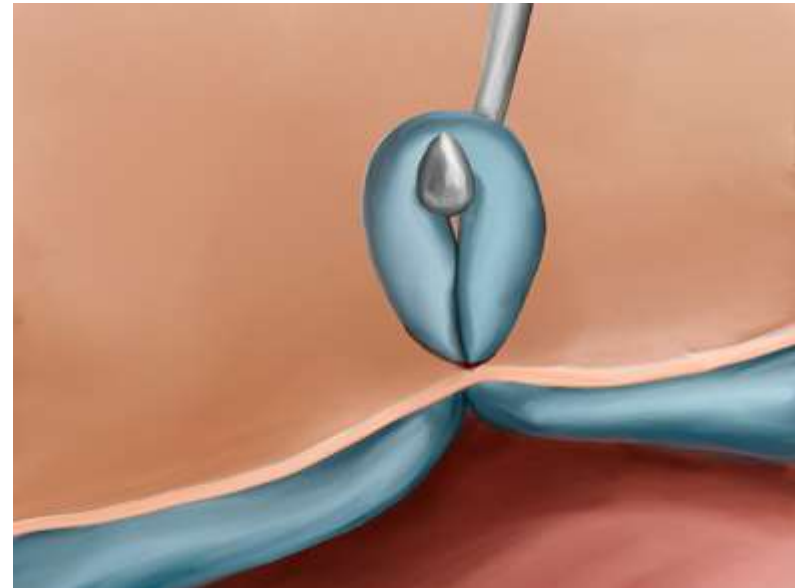
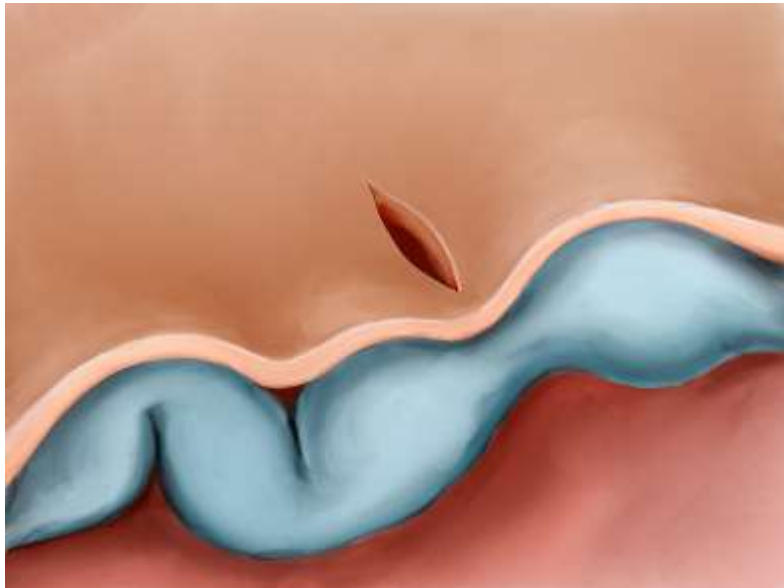






# MICROPHLEBECTOMY

- Previously mapped vein (with sterile pen)
- Small microincisions of 1 to 2 mm in diameter are placed a 2 to 3 cm from each other over mapped vein
- Small microhook is used to remove the varicose veins

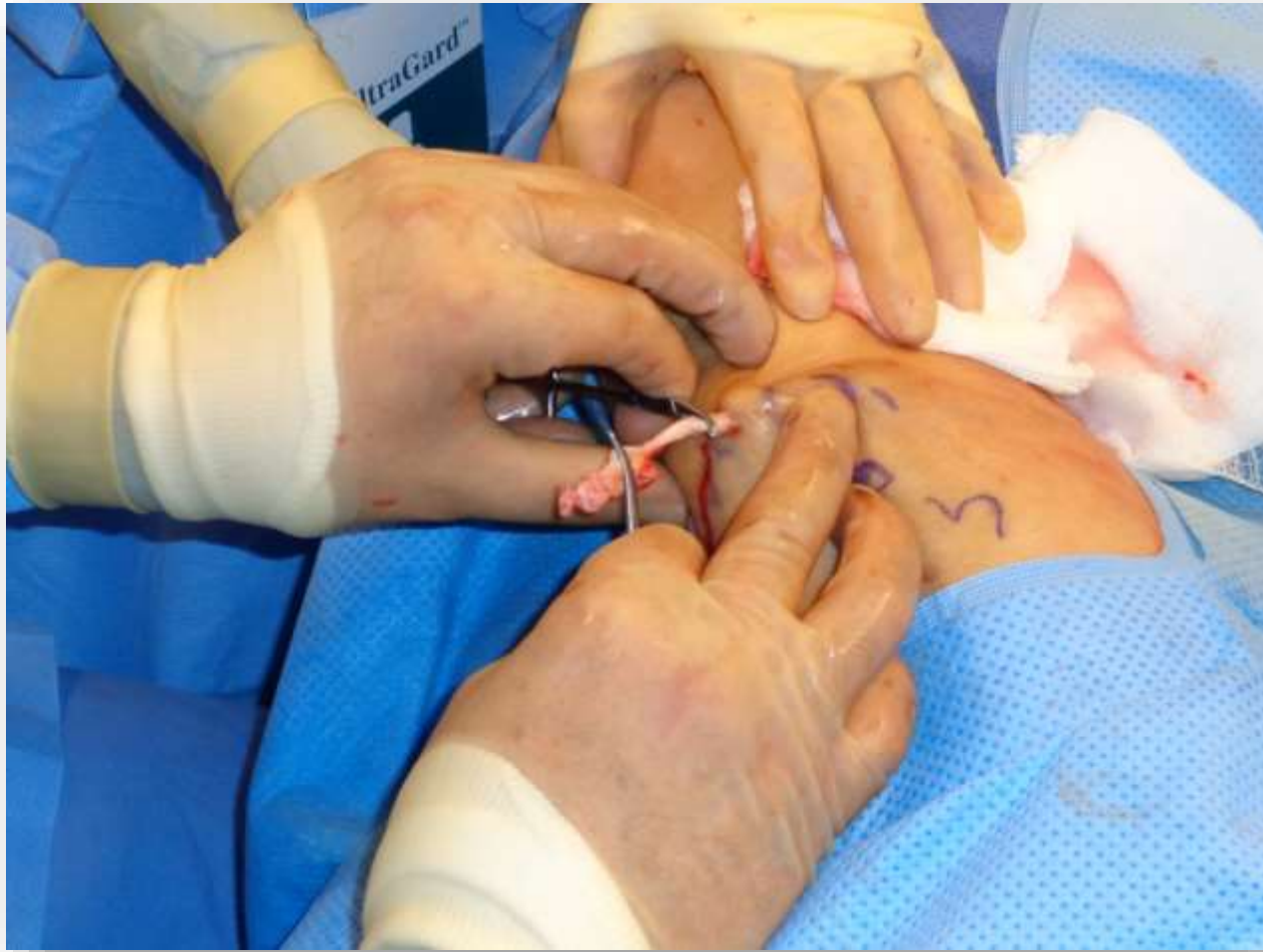


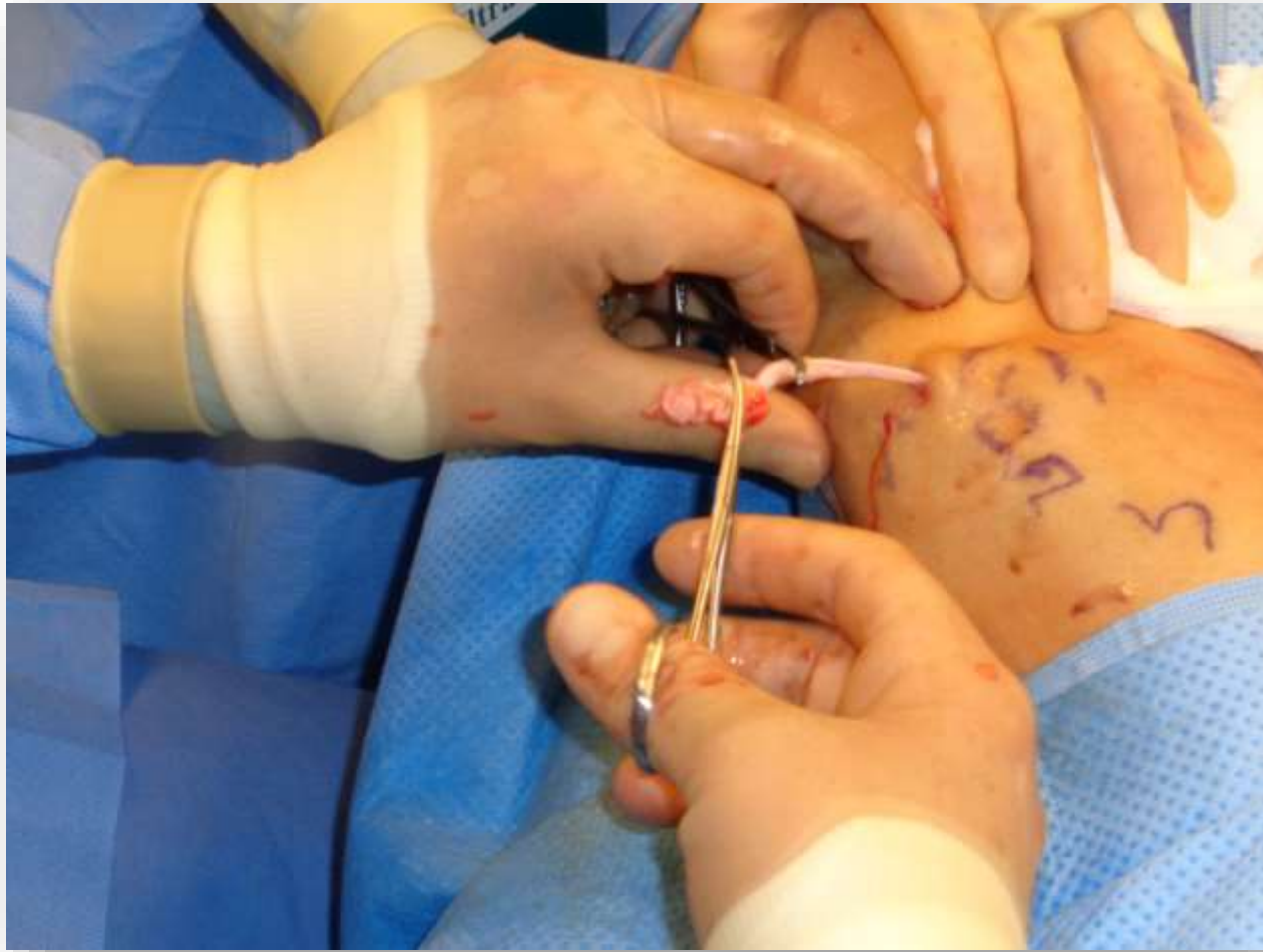
















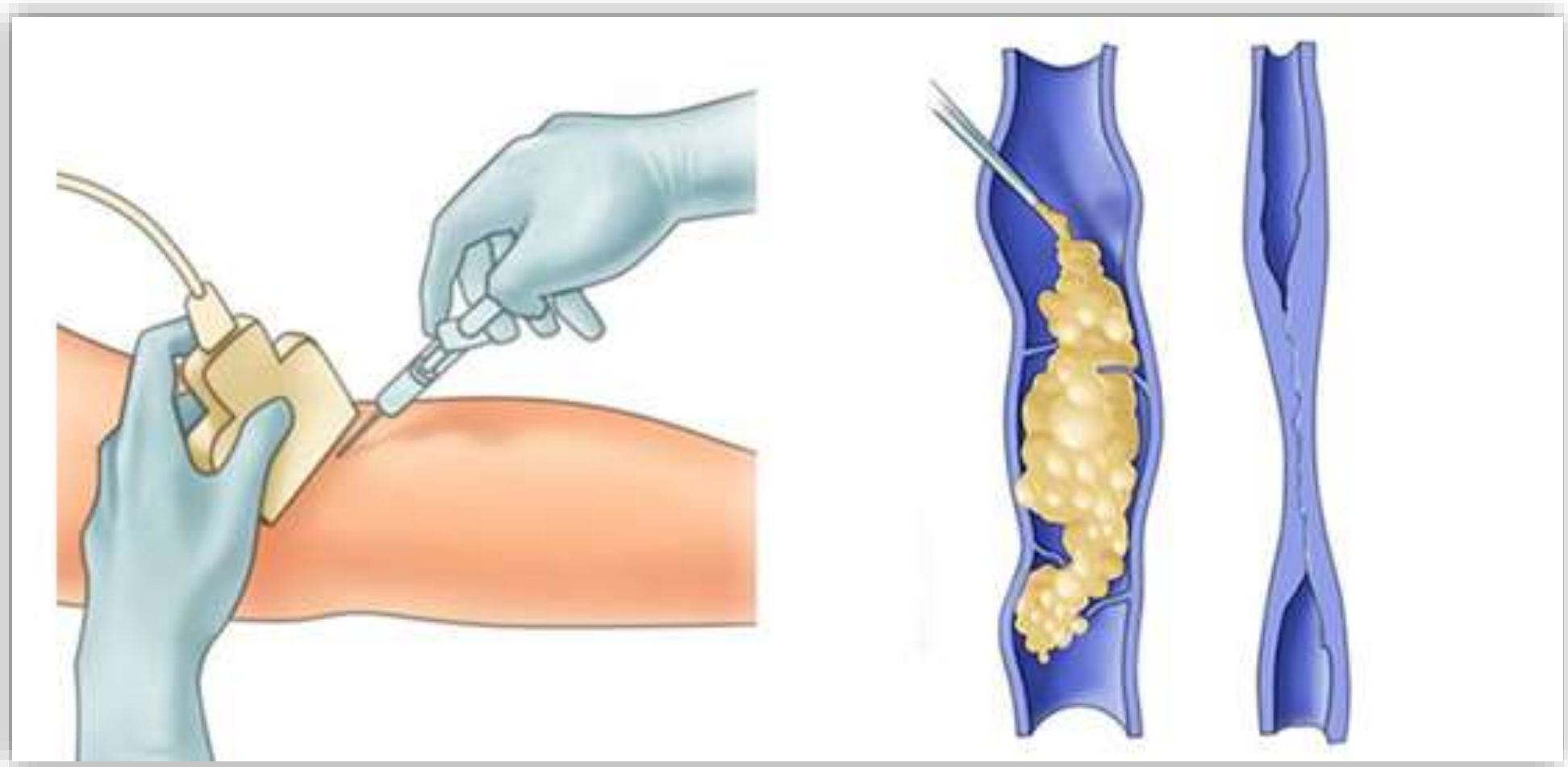
# POST OP

- At the end of the operation, the leg is carefully cleansed with antiseptic solution.
- Bleeding easily controlled with compression.
- Steri-strips for incision closure

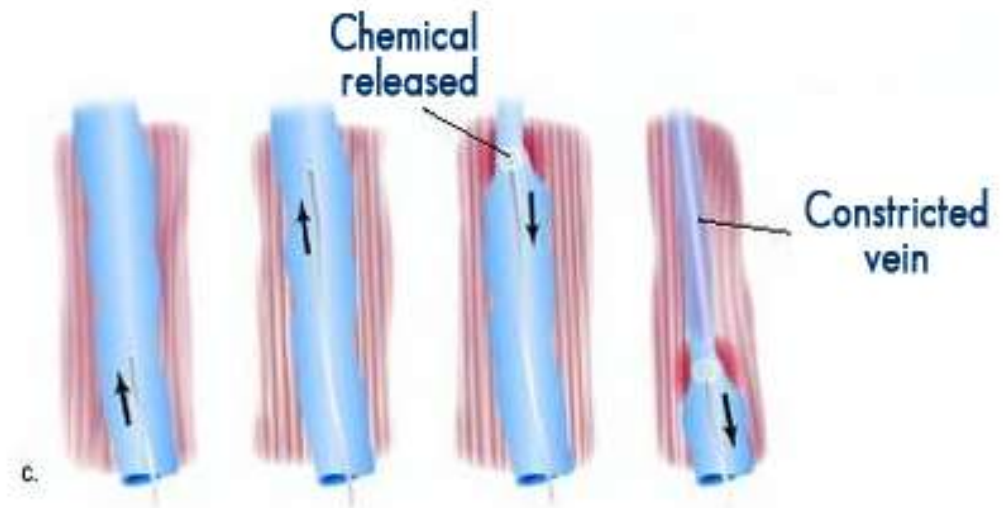
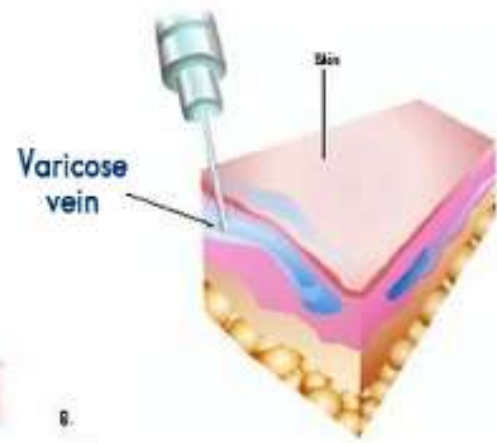
# SCLEROTHERAPY

- Injection of solution (hypertonic saline, alcohol such as STS or polidocanol, glycerine, etc) directly into varicose vein
- Can be done with or without ultrasound guidance
- Recommended that an ultrasound be performed prior to ensure no direct connection to the deep and/or that there is not full saphenous vein reflux that may be amenable to ablation

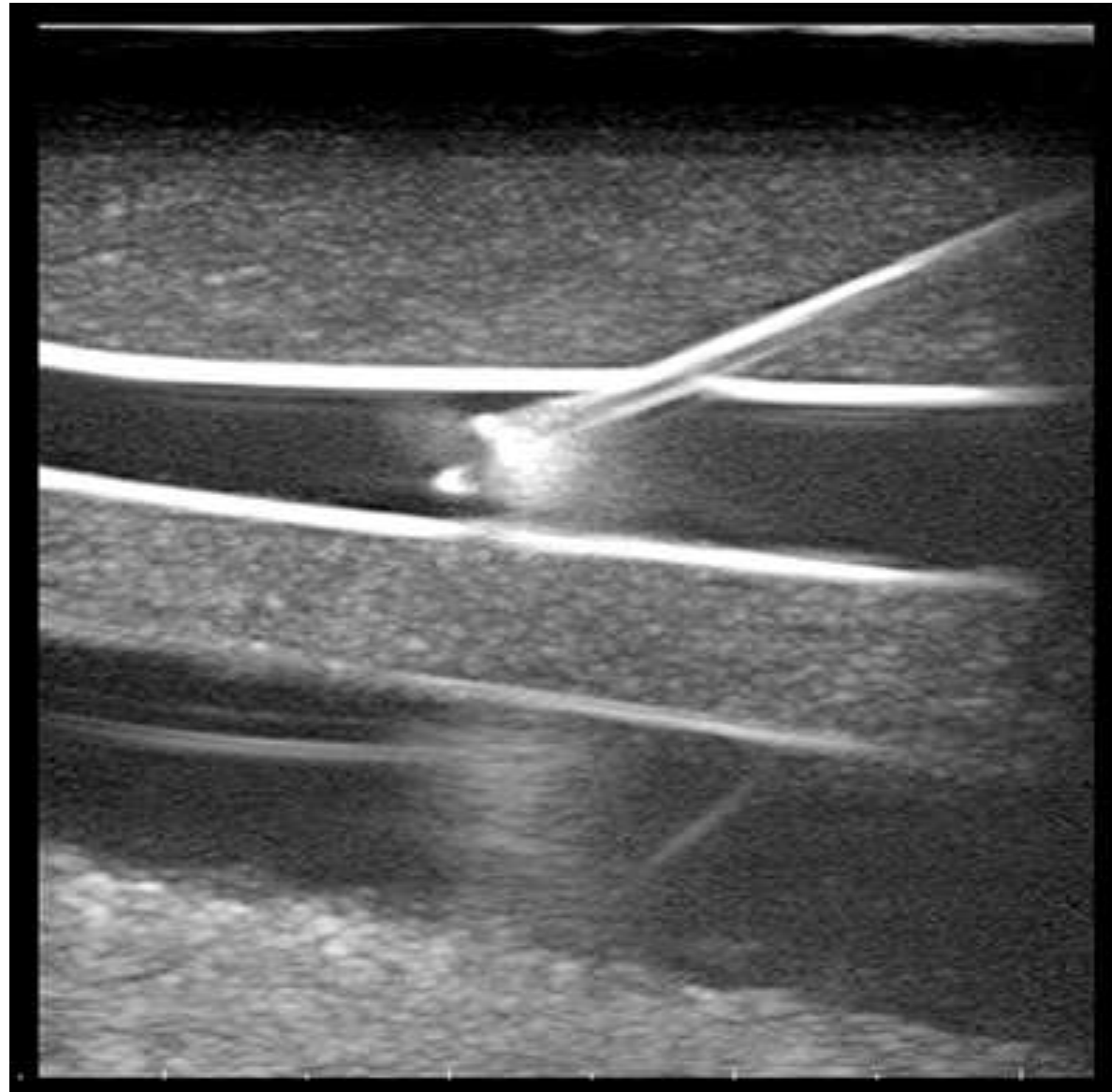




## Sclerotherapy for Varicose Veins







# SUMMARY

- Surgery extinct
- Treatment involves elimination of the problem which is reflux via endovenous ablation
  - Completely ambulatory
  - Safe
- Varicose tributaries need to be addressed
  - Foam sclerotherapy
  - Microphlebectomy



THANK YOU

