



YONSEI
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Varicose vein

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Disclosures

I have nothing to disclose

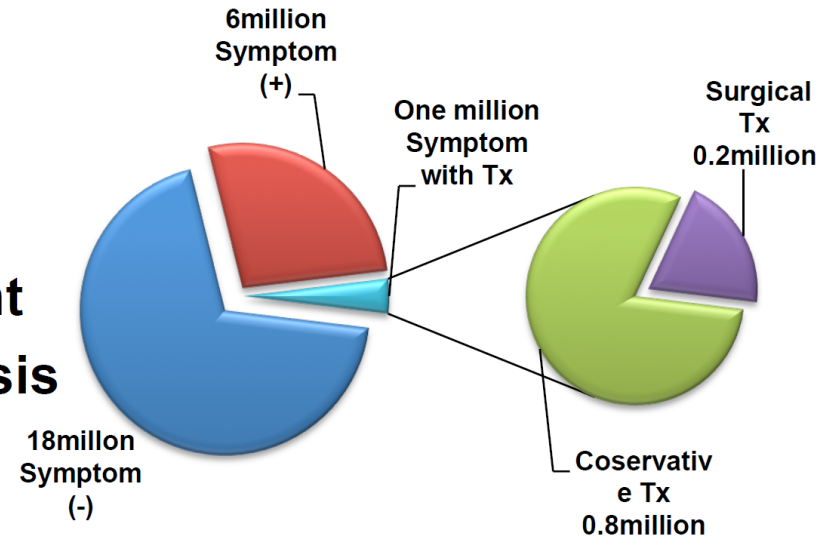
Definitions

- **Varicose vein**
 - **Abnormally dilated saccular or cylindrical superficial veins, which can be circumscribed or segmental (WHO)**
- **Venous insufficiency**
 - **Any abnormality of the peripheral venous system that reduces or impedes venous return.**
- **Chronic venous disorder**
 - **Full spectrum of morphological and functional abnormalities of the venous system**
- **Chronic venous insufficiency**
 - **Functional abnormality of the venous system and is usually reserved for patients with more advanced disease including edema(C3), skin change(C4), or venous ulcers (C5-C6)**

Incidence & Risk Factors

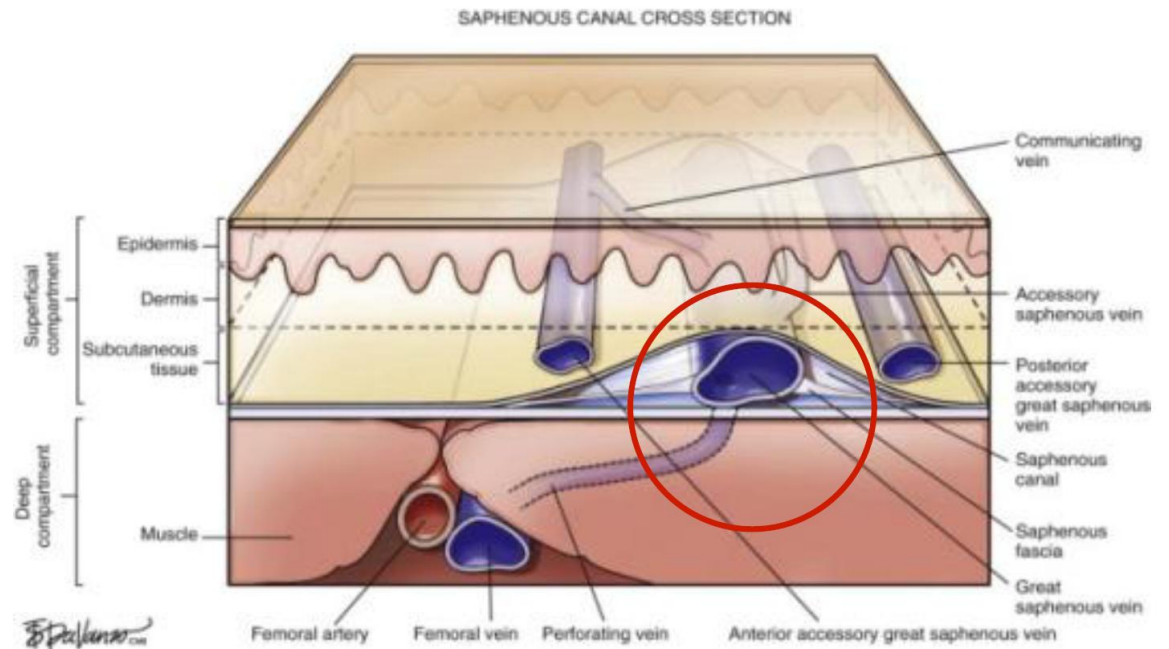
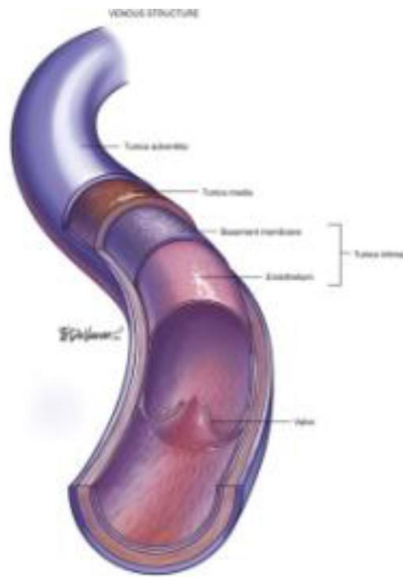
● Incidence (50%)

- 25~40% minor VV
- 10~20% significant VV
- 10~15% medically significant
- 0.5% chronic venous stasis
 ulceration



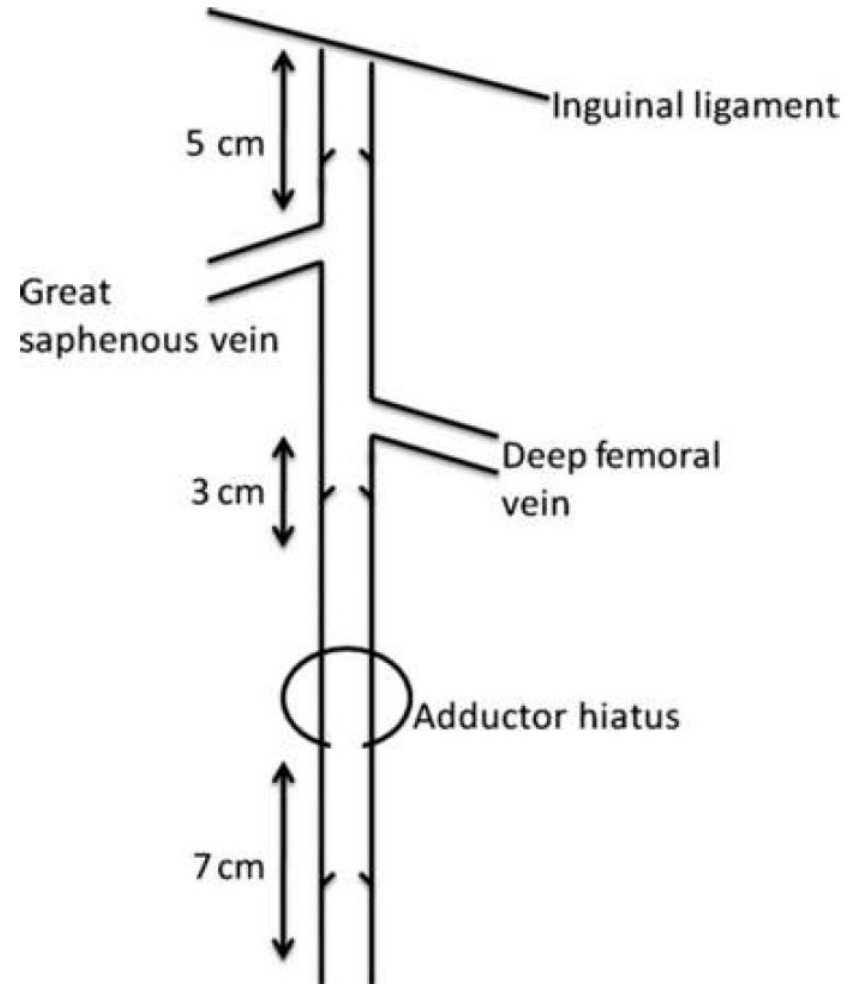
● Risk factors

- Age > 50 years
- Heredity
- Hormone
- Gravitational hydrostatic force
- Hydrodynamic force due to muscle contraction
- Occupation
- Female gender
- Pregnancy
- Obesity

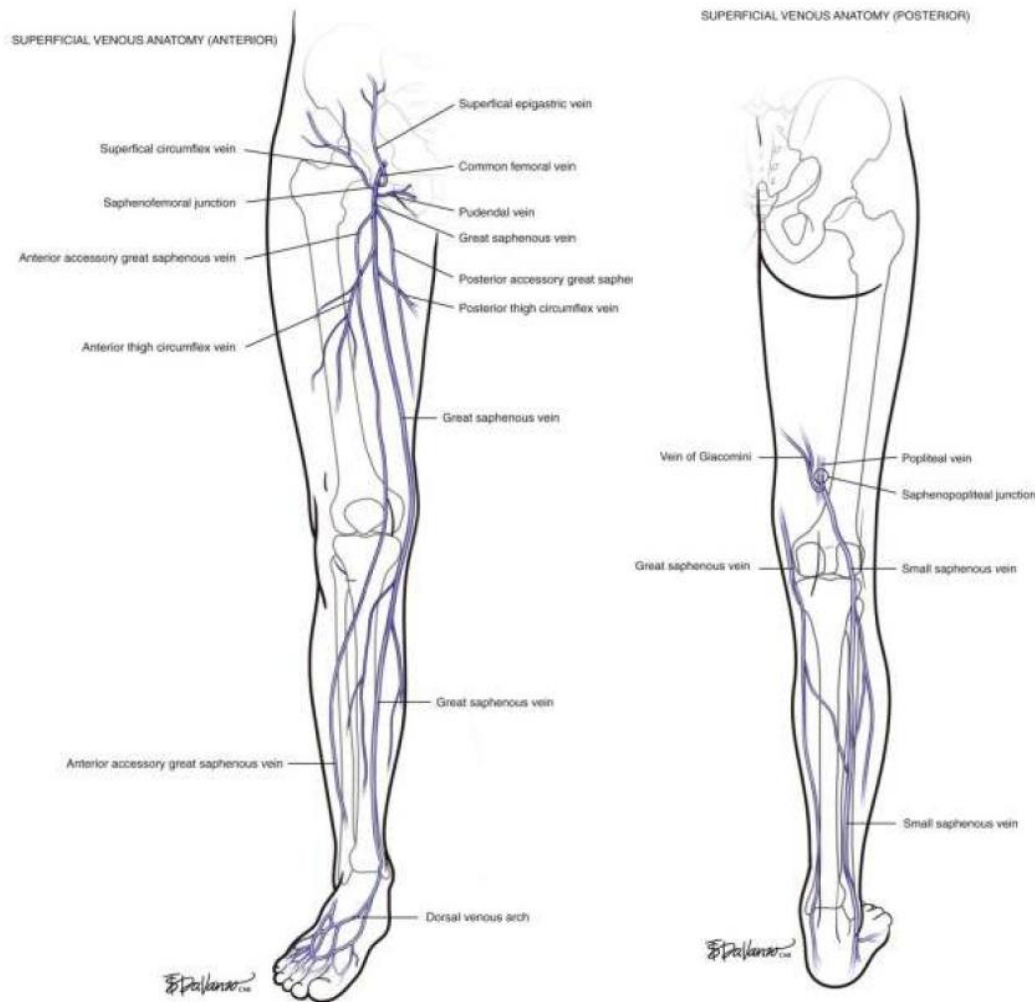


Venous System

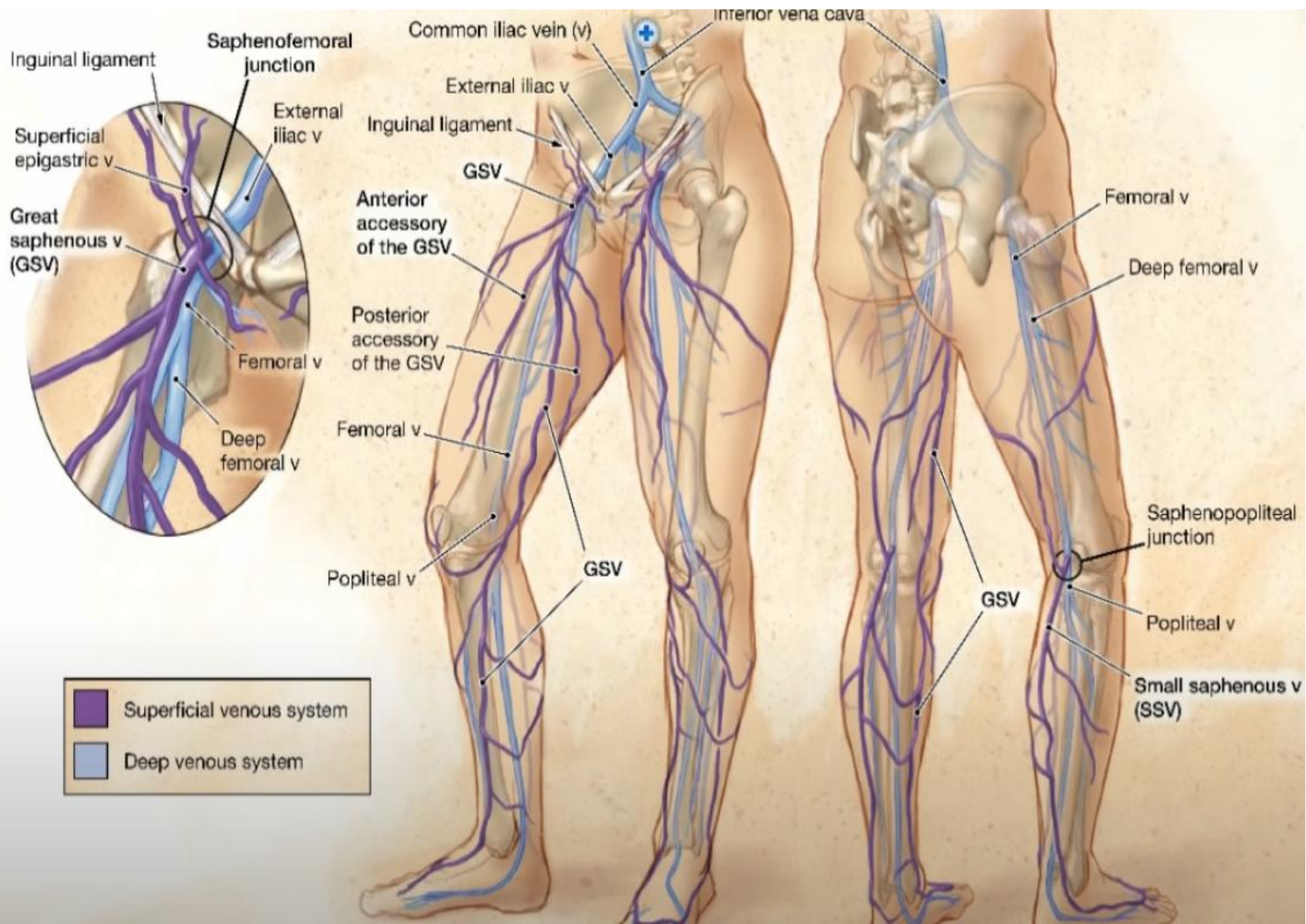
- **Deep system**
 - 90-95% of the blood returned
 - **Superficial system**
 - Reservoir of blood
 - 5-10% of blood returned
 - **Venous valve**
 - Bicuspid, one-way
 - Numerous at 2cm intervals
- | | |
|--------------------------|-------|
| Total in lower extremity | 200 |
| GSV | 8~12 |
| SSV | 7~13 |
| Ant/Post. Tibial V | 10~20 |



Superficial Vein



- Anterior accessory great saphenous vein (AAGSV)
- Posterior accessory great saphenous vein (PAGSV)
- Superficial accessory great saphenous vein (SAGSV)
- Posterior thigh circumflex vein (PTCV)
- Vein of Giacomini (intersaphneous V)



C-E-A-P♪

- C-E-A-P?

C : Clinical signs ♪

E : Etiology

A : Anatomy

P : Pathophysiology

- Etiologic classification

Ec: congenital

Ep: primary

Es: secondary (post-thrombotic)

En: no venous cause identified

- Anatomic classification

As: superficial veins

Ap: perforator veins

Ad: deep veins

An: no venous location identified

- Pathophysiologic classification

Pr: reflux

Po: obstruction

Pr,o: reflux and obstruction

Pn: no venous pathophysiology identifiable

Symptoms & Signs

- Symptoms

- Pain: dull, burning pain, gradual onset
- Heaviness, discomfort, extremity fatigue
- Cutaneous itching

- Signs

- *Venous dilation, varicosity (C1,2)*
- Edema (C3)
- Skin pigmentation (C4a)
- Lipodermatosclerosis (C4b)
- Venous ulceration (C5, C6)



Table 3. The 2020 update of the CEAP (Clinical Etiological Anatomical Pathophysiological

Class	Description
<i>Clinical (C) class</i>	
C0	No visible or palpable signs of venous disease
C1	Telangiectasia or reticular veins
C2	Varicose veins
C2r	Recurrent varicose veins
C3	Oedema
C4	Changes in skin and subcutaneous tissue secondary to CVD
C4a	Pigmentation or eczema
C4b	Lipodermatosclerosis or atrophie blanche
C4c	Corona phlebectatica
C5	Healed ulcer
C6	Active venous ulcer
C6r	Recurrent venous ulceration
Symptomatic or not: subscript 'S' or subscript 'A'	S: symptomatic, including ache, pain, tightness, skin irritation, heaviness, cramps, and other complaints attributable to venous dysfunction A: asymptomatic
<i>Etiological (E) class</i>	
Ep	Primary
Es	Secondary
Es1	Secondary – intravenous
Ese	Secondary – extravenous
Ec	Congenital
En	None identified
<i>Anatomical (A) class</i>	
As	Superficial
Ad	Deep
Ap	Perforators
An	No identifiable venous location
<i>Pathophysiological (P) class*</i>	
Pr	Reflux
Po	Obstruction
Pr,o	Reflux and obstruction
Pn	No pathophysiology identified



Diagnosis

Recommendation 3

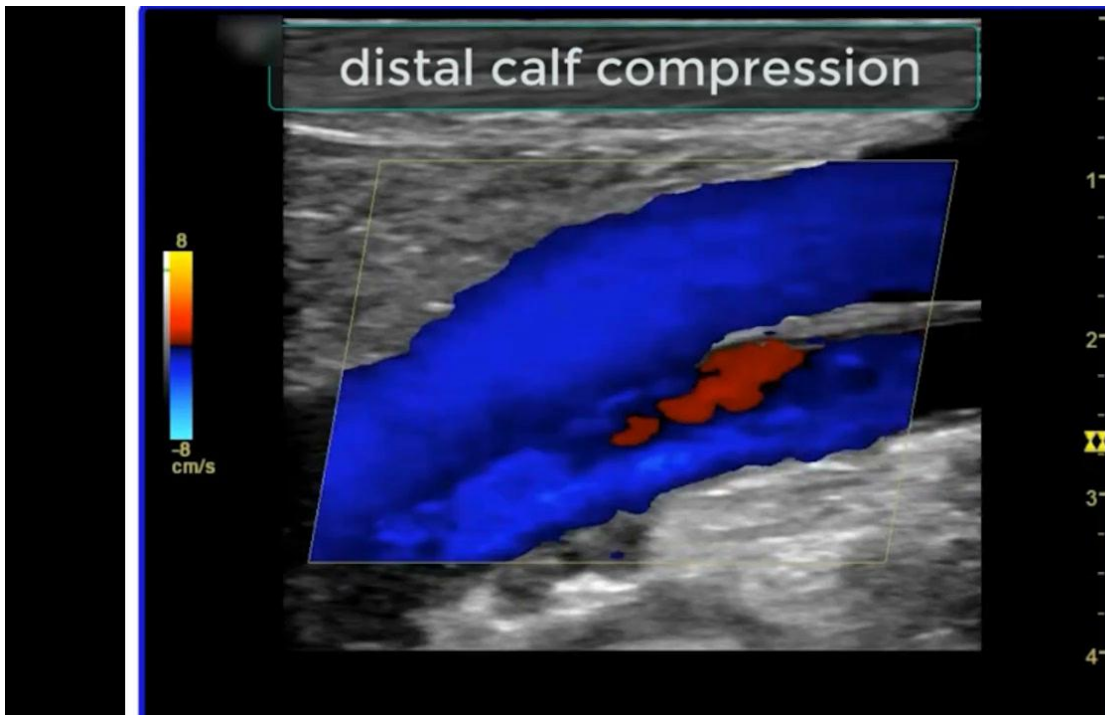
Unchanged



For diagnosis and treatment planning in patients with suspected or clinically evident chronic venous disease, full lower limb venous duplex ultrasound is recommended as the primary imaging modality.

Class	Level	References	ToE
I	B	Blomgren <i>et al.</i> (2011) ⁴³	

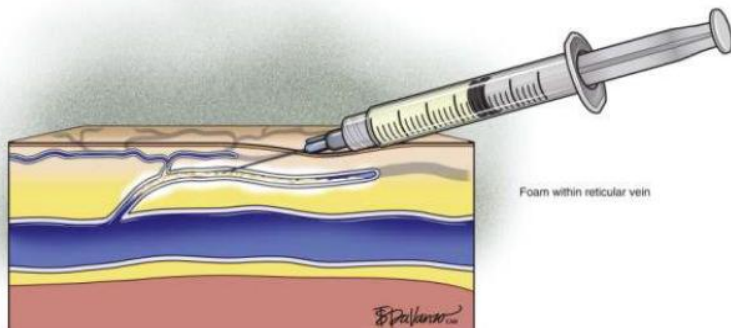
- Deep vein : >1s
- Superficial and perforating vein : >0.5s



Medical & Sclerotherapy

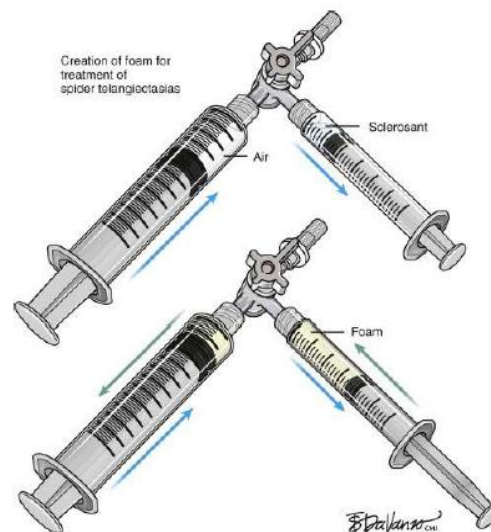
● Pentoxifyllin

- PDE₄ inhibitor
- Increases intracellular cAMP
- Stimulates protein kinase
- Reduces blood viscosity
- Decreases platelet aggregation and thrombus formation
- Variable efficacy



● Sclerotherapy

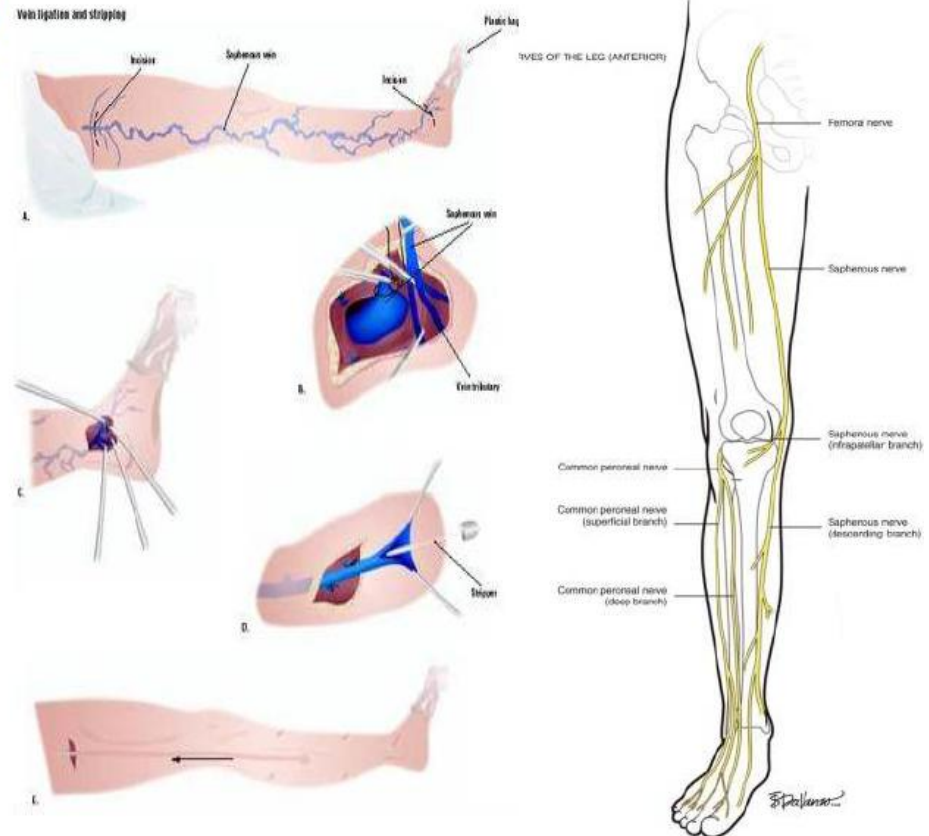
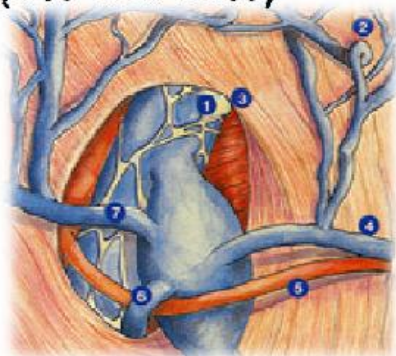
- 0.2% sodium tetradecyl injected directly into spider angiomas and smaller superficial varicosities
- Complications (<5%)
 - allergic reaction, hypo/hyper-pigmentation, local skin necrosis



Treatment

High Ligation & Stripping

- High ligation & stripping
 - Basic surgical treatment
 - Surgical complications
 - * pain
 - * nerve injury
- partial vs. Complete stripping
(7% vs. 39%)



Endovenous Thermal Ablation

- Catheter based technology
- Mechanisms
 - Endothelial damage
 - Collagen vein wall contraction
 - Thrombus formation
 - Scar formation
- Advantages
 - Low morbidity / quick recovery times
 - 90 % success in nearly all mid-term case series
- Disadvantages
 - Expensive
 - Alone will not provide complete treatment and patient satisfaction
- Laser, radiofrequency, cryoablation

Endovenous Laser Treatment (EVLT)

● Major complications

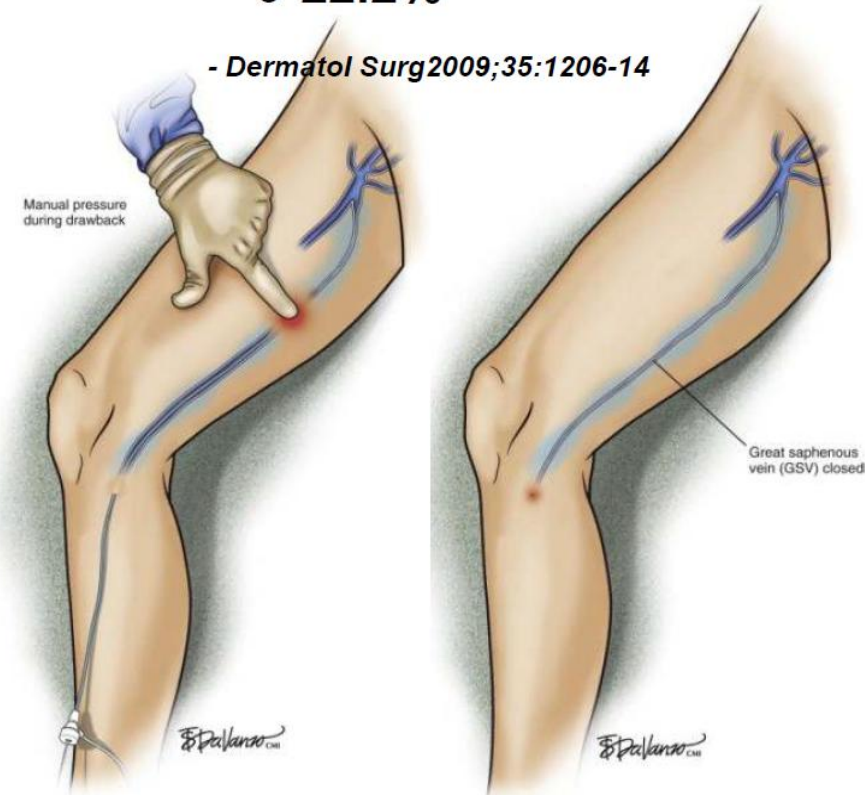
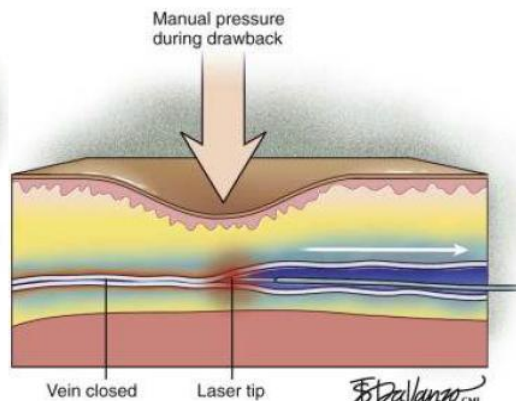
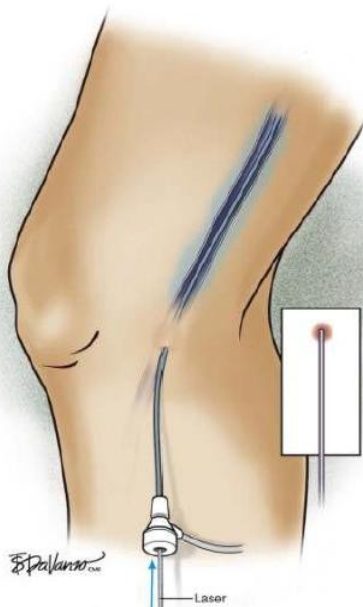
- Laser-related (incorrect location, burn)
- Deep vein thrombosis
- Phlebitis

0.2-9%

0-5.7%

0-22.2%

- *Dermatol Surg*2009;35:1206-14

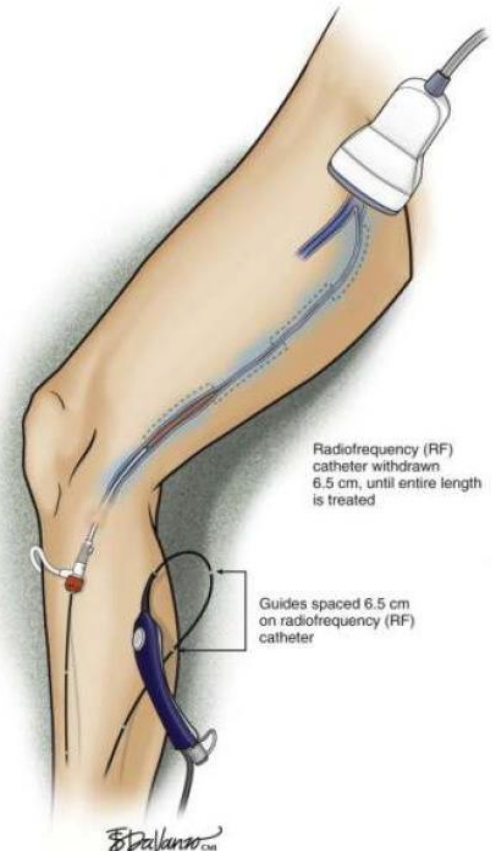
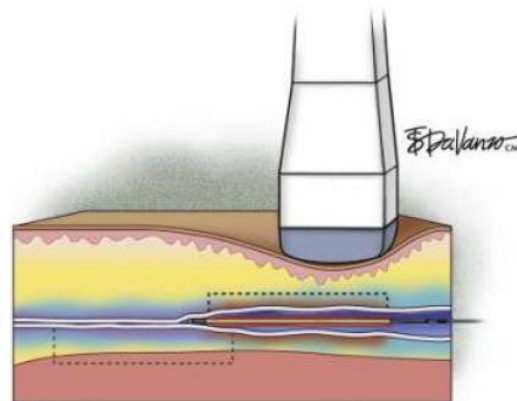
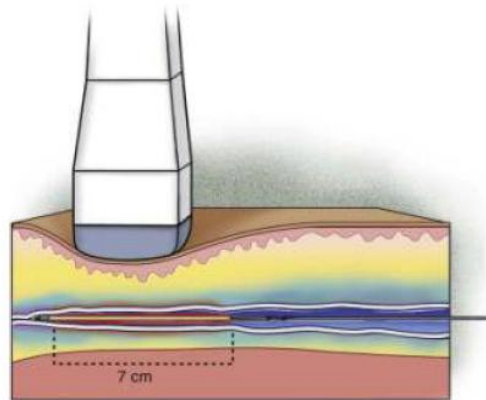
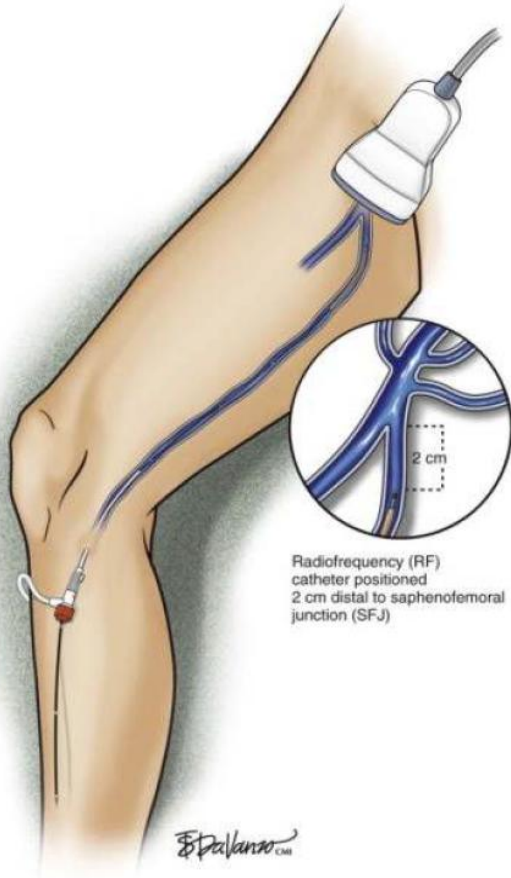


Great saphenous vein (GSV) closed

Radiofrequency Ablation (RFA)

- Occlusion rate 81~99.6%
- Complication < 5%

- J Cardiovasc Surg (Torino) 2008; 49:213-233
- J Vasc Surg 2008; 47:151-156



Cyanoacrylate closure (CAC)



Treatment

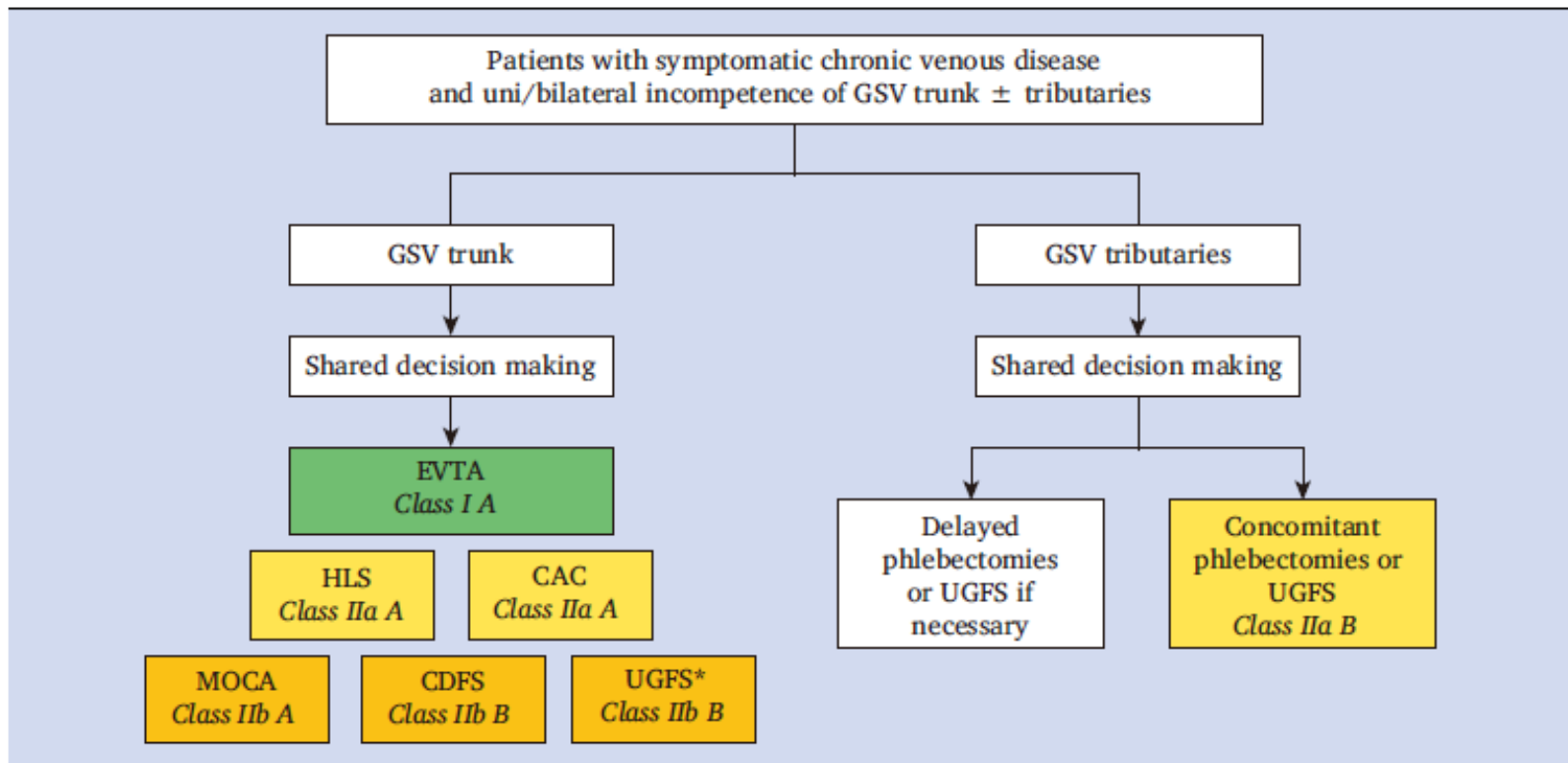


Figure 7. Interventional treatment options for patients with symptomatic great saphenous vein (GSV) incompetence. Alternative strategies, with preservation of the GSV trunk (CHIVA, ASVAL), have not been included in this flowchart. *Ultrasound-guided foam sclerotherapy (UGFS) only if GSV diameter is <6 mm. EVTA = endovenous thermal ablation; HLS = high ligation/stripping; CAC = cyanoacrylate closure; MOCA = mechanochemical ablation; CDFS = catheter-directed foam sclerotherapy; UGFS = ultrasound-guided foam sclerotherapy; CHIVA = ambulatory conservative haemodynamic treatment of venous incompetence in outpatients; ASVAL = ambulatory selective varices ablation under local anaesthesia.

Treatment

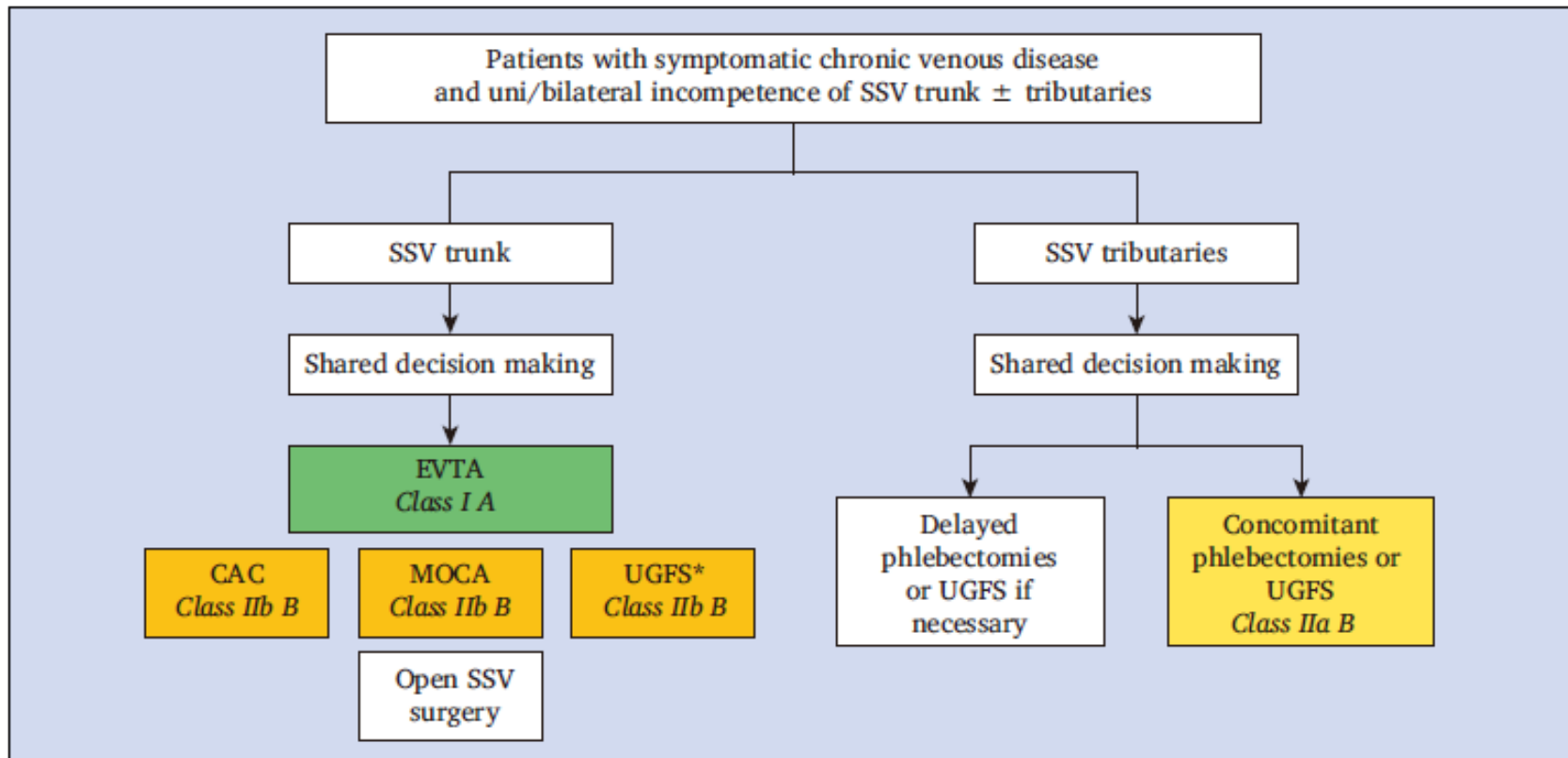


Figure 8. Interventional treatment options for patients with symptomatic small saphenous vein (SSV) incompetence. Alternative strategies, with preservation of the SSV trunk (CHIVA, ASVAL), have not been included in this flowchart. *Ultrasound-guided foam sclerotherapy (UGFS) only if SSV diameter is <6 mm. EVTA = endovenous thermal ablation; CAC = cyanoacrylate closure; MOCA = mechanochemical ablation; CHIVA = ambulatory conservative haemodynamic treatment of venous incompetence in outpatients; ASVAL = ambulatory selective varices ablation under local anaesthesia.

CLINICAL PRACTICE GUIDELINE DOCUMENT

Editor's Choice – European Society for Vascular Surgery (ESVS) 2022 Clinical Practice Guidelines on the Management of Chronic Venous Disease of the Lower Limbs★

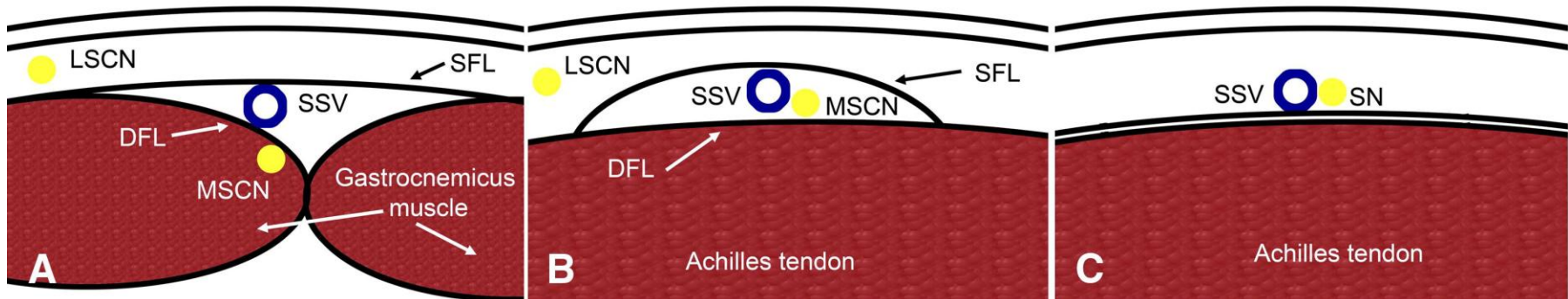
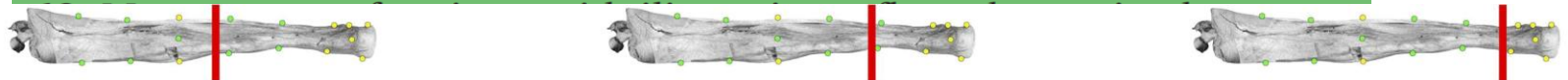
Table 2. Classes of recommendations according to ESC (European Society of Cardiology)

Class of recommendation	Definition
Class I	Evidence and/or general agreement that a given treatment or procedure is beneficial, useful and effective
Class II	Conflicting evidence and/or a divergence of opinion about the usefulness/efficacy of the given treatment or procedure
Class IIa	<i>Weight of evidence/opinion is in favour of usefulness/efficacy</i>
Class IIb	<i>Usefulness/efficacy is less well established by evidence/opinion</i>
Class III	Evidence or general agreement that the given treatment or procedure is not useful/effective, and in some cases may be harmful

Table 1. Levels of evidence according to ESC (European Society of Cardiology)

Level of evidence A	Data derived from multiple randomised clinical trials or meta-analyses
Level of evidence B	Data derived from a single randomised clinical trial or large non-randomised studies
Level of evidence C	Consensus of experts opinion and/or small studies, retrospective studies, and registries

11. Below knee ECS in patients with CVD clinical class C4b
15. Interventional treatment for CVD patients with symptomatic VVs (C2)
17. Interventional treatment for CVD patients with skin changes (C4-C6)
18. Procedures for superficial venous incompetence in the outpatient setting
19. Ultrasound guided tumescent anaesthesia for EVTA
24. Duration of post-operative compression after superficial interventions to be decided on an individual basis
25. Risk assessment for VTE in patients undergoing superficial venous intervention
29. Selection of EVTA device left to the discretion of the treating physician
32. Foam sclerotherapy under ultrasound guidance
38. DUS of lower extremity veins in patients presenting with reticular veins and/or telangiectasias (C1)
39. In patients with C1 disease, treat larger incompetent veins before treating smaller veins
40. Sclerotherapy as first choice for reticular veins
41. Care taking not to injure the sural nerve, when cannulating the SSV below midcalf
62. DUS surveillance after endovascular or surgical reconstruction for iliac vein outflow obstruction



93. Elastic compression in pregnant women with symptoms/signs of CVD

Severance

With the Love of God, Free Humankind from Disease and Suffering

