

Ultrasound appearances post RFA/sclerotherapy

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Outline

Introduction to varicose veins

Anatomy and pathophysiology

Varicose vein treatments- RFA and foam

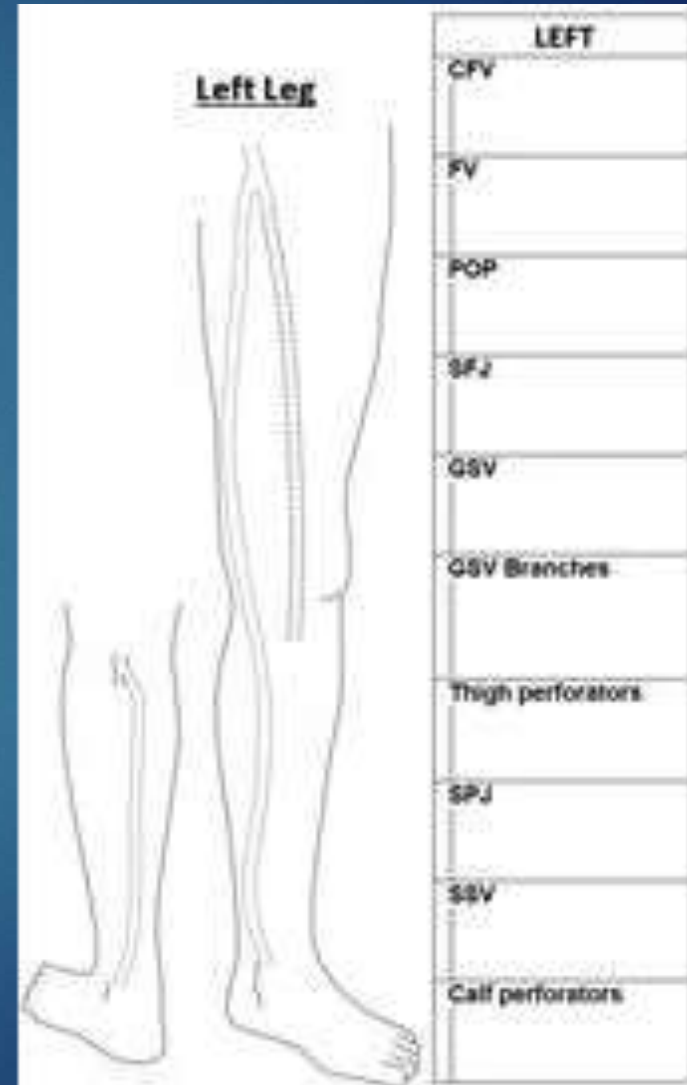
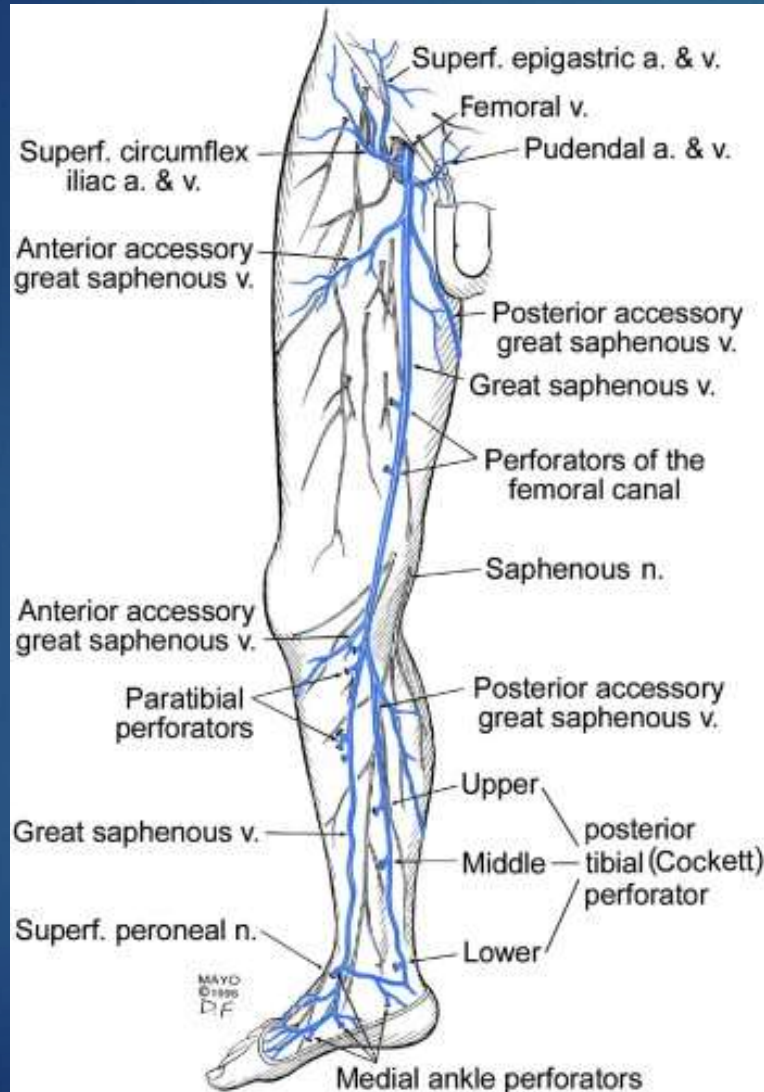
What does successful treatment look like?

What can go wrong?

Introduction

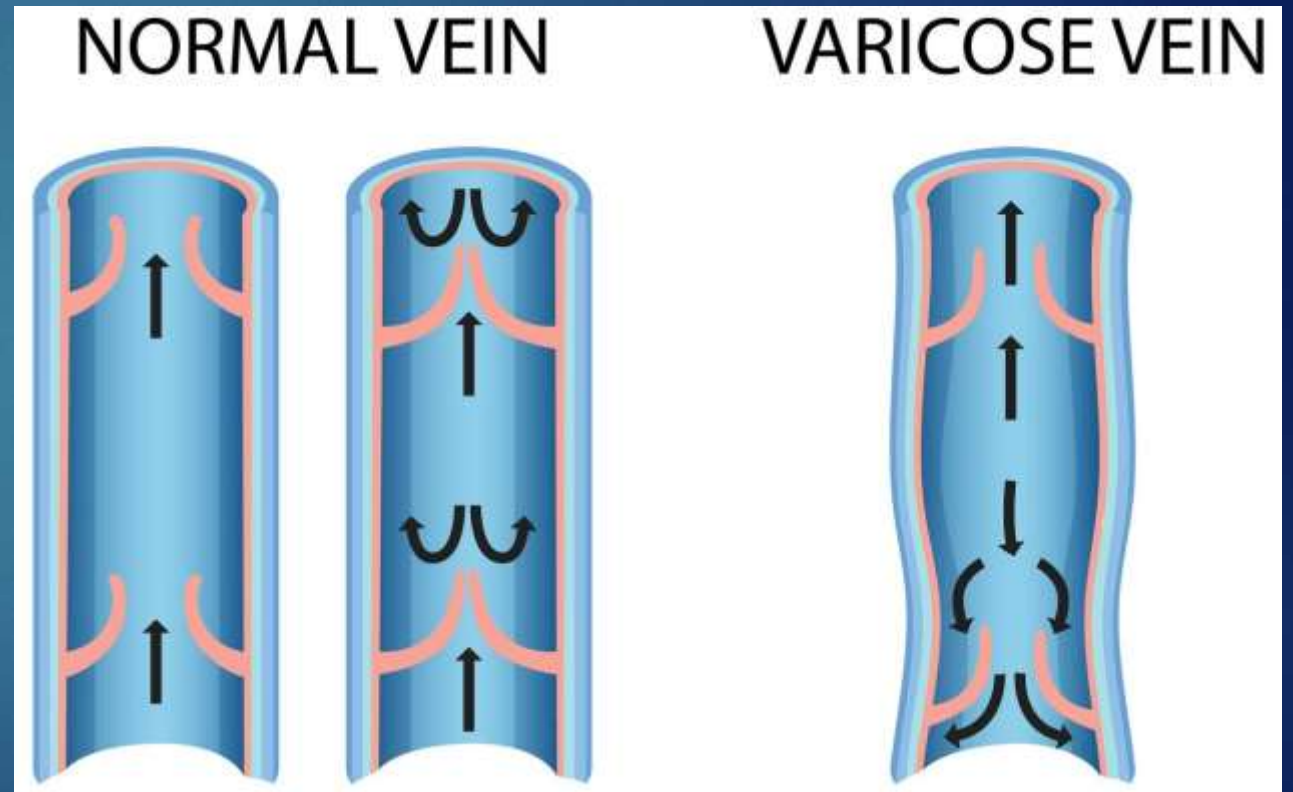
- ▶ ~One third of men and women aged 18-64 suffer with varicose veins
- ▶ 3-6% of people who have varicose veins in their lifetime will develop venous ulcers

Anatomy



Pathophysiology

- ▶ Varicose veins - dilated subcutaneous veins with reversed blood flow due to incompetent valves
- ▶ Risk factors - age, genetics, pregnancy, prolonged periods of standing



Treatment

Endothermal:

- ▶ Radiofrequency ablation (RFA), Endovenous laser therapy (EVLT)

Surgical:

- ▶ Vein stripping, ligation of the saphenofemoral junction (SFJ)

Other:

- ▶ Foam sclerotherapy, cyanoacrylate closure, compression stockings
- ▶ What is a good vein for each treatment?

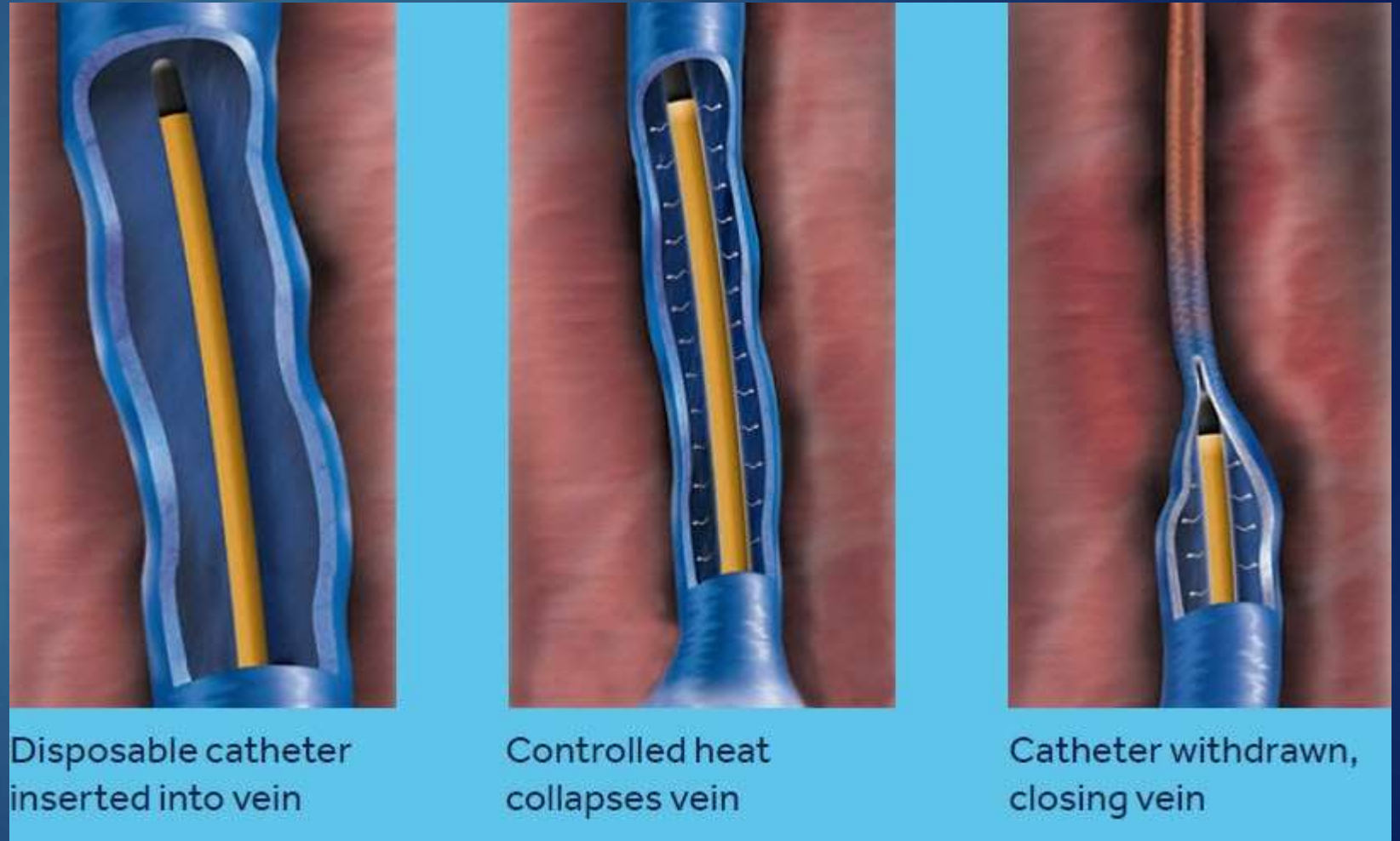
Indications for treatment

Clinical Manifestations, Etiology, Anatomic distribution, Pathophysiology

CEAP classification	Clinical description
C0	No visible signs of venous disease
C1	Telangiectasias or reticular veins
C2	Varicose veins
C3	Oedema
C4	Skin changes
C5	Healed venous ulcer
C6	Active or recurrent venous ulcer

What is RFA?

- Radiofrequency energy heats vein walls so vein collapses
- Incision made and RFA catheter inserted under ultrasound guidance
- Catheter 2-3cm from junction



RFA tumescence

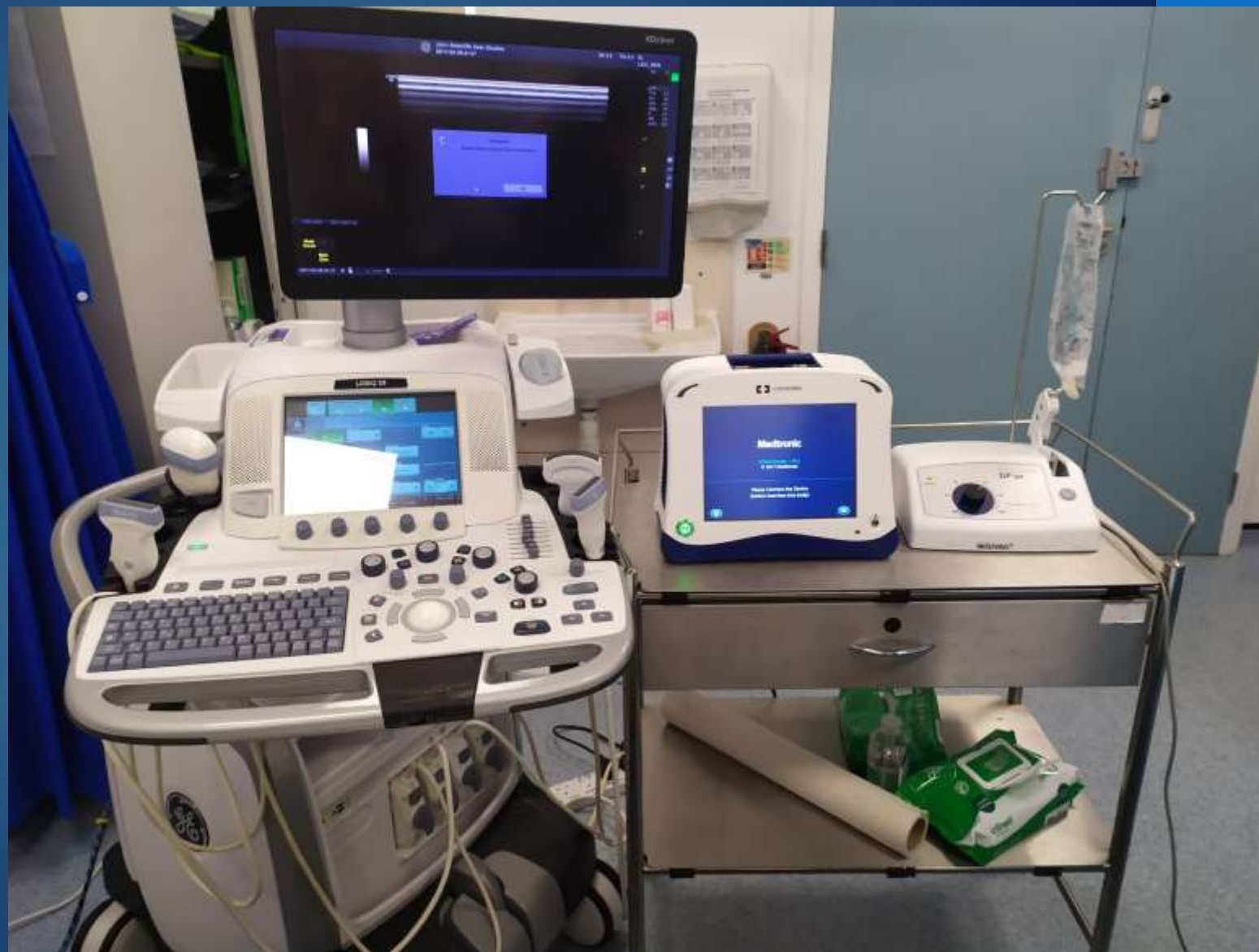


- Local anaesthetic pumped within fascia to surround GSV
- Pain relief, prevents damage to tissues and helps with post treatment inflammation

RFA room set up



RFA room set up



What is foam sclerotherapy?

- ▶ Injections of sclerosing substance into the vein to damage the endothelium and close it off.

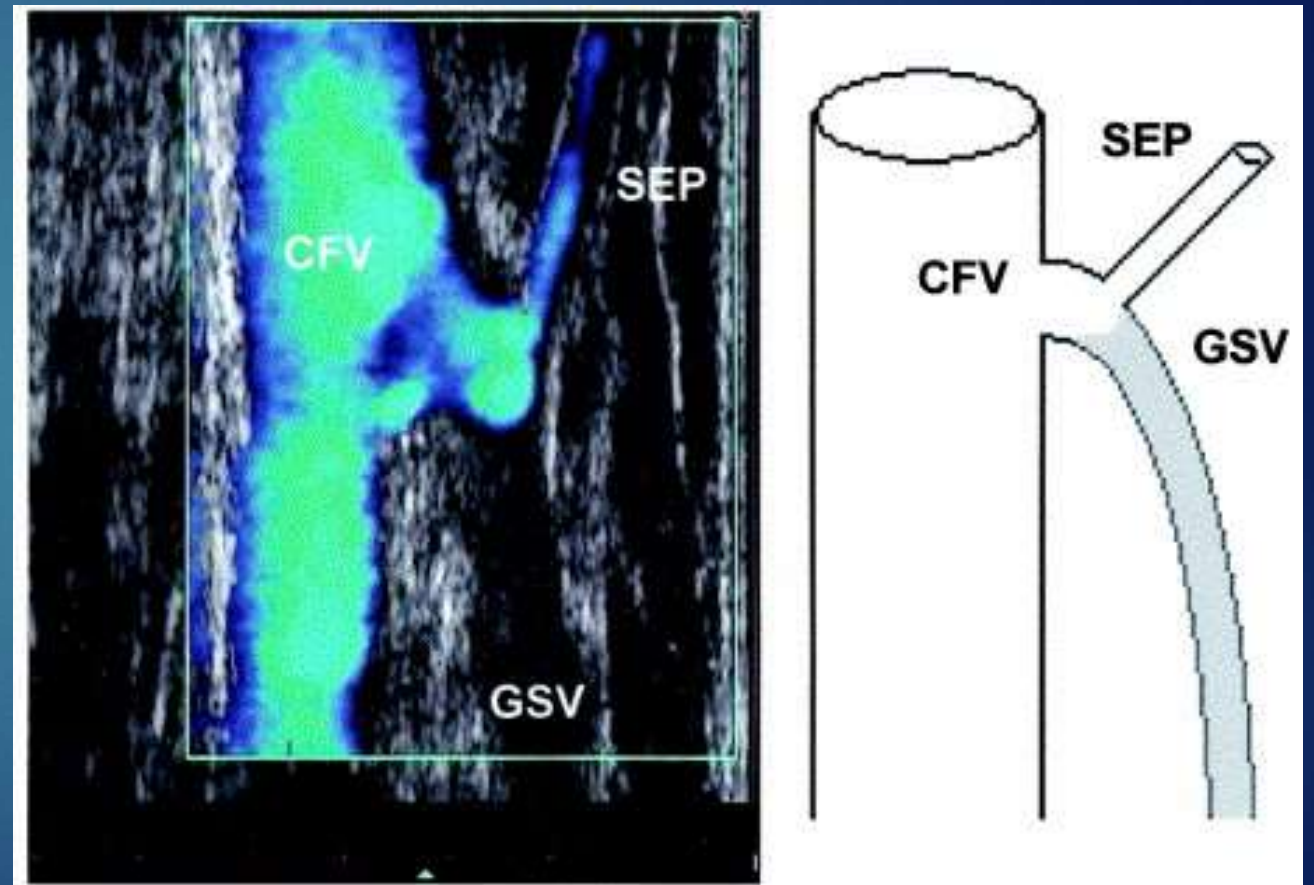


- ▶ A double syringe is used with a three way stopcock to mix the foam solution

Post treatment



SEP- Superficial external pudendal vein



Post RFA treatment

Immediately after: GSV is **smaller in diameter** showing evidence of inflammation and vein wall thickening. Lumen may not necessarily be closed



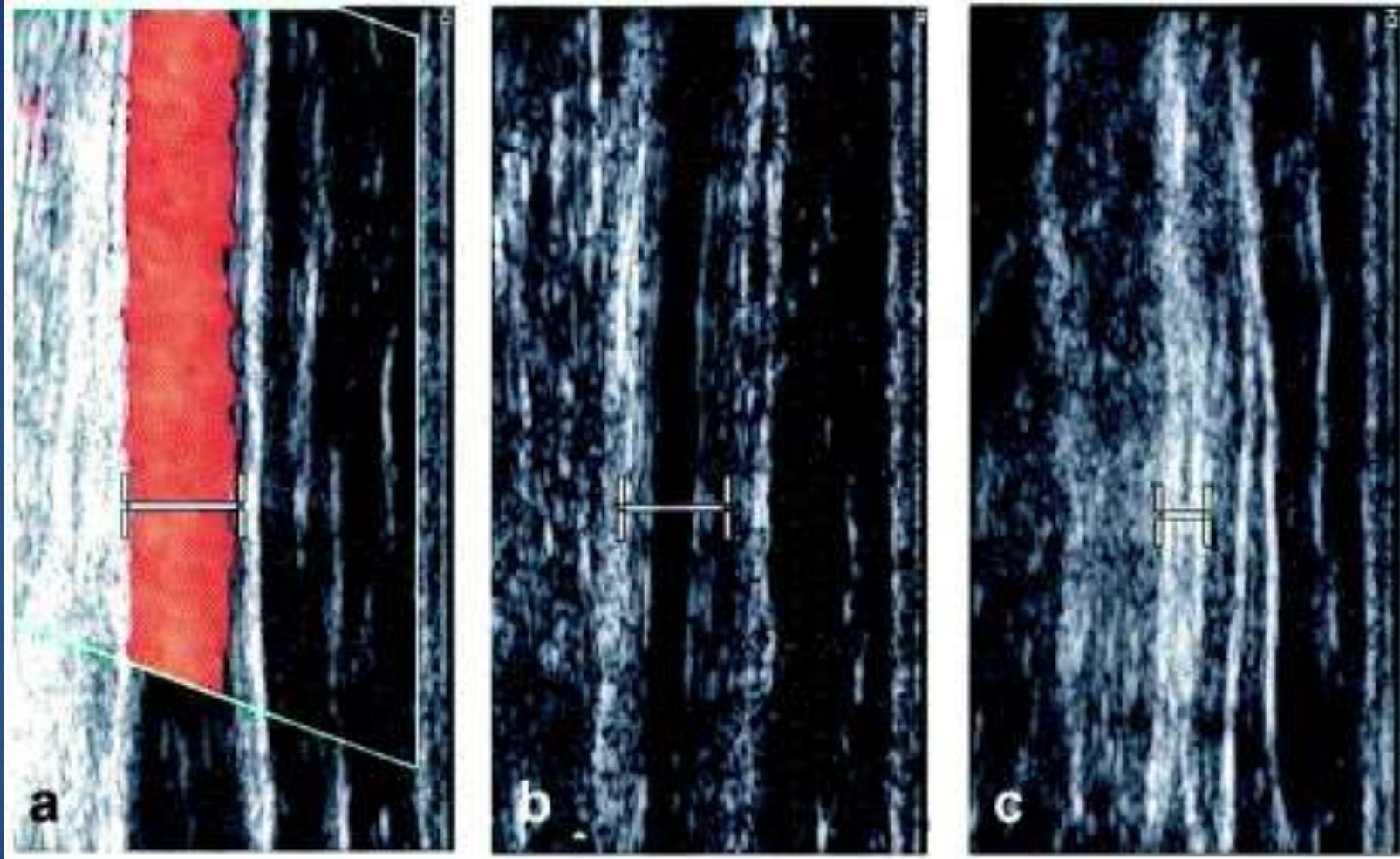
1 week after the procedure: GSV trunk appears **obliterated** with an echogenic lumen



1 year after procedure: GSV trunk **shrunk** with a small area of normal antegrade flow at the SFJ.

Post RFA treatment

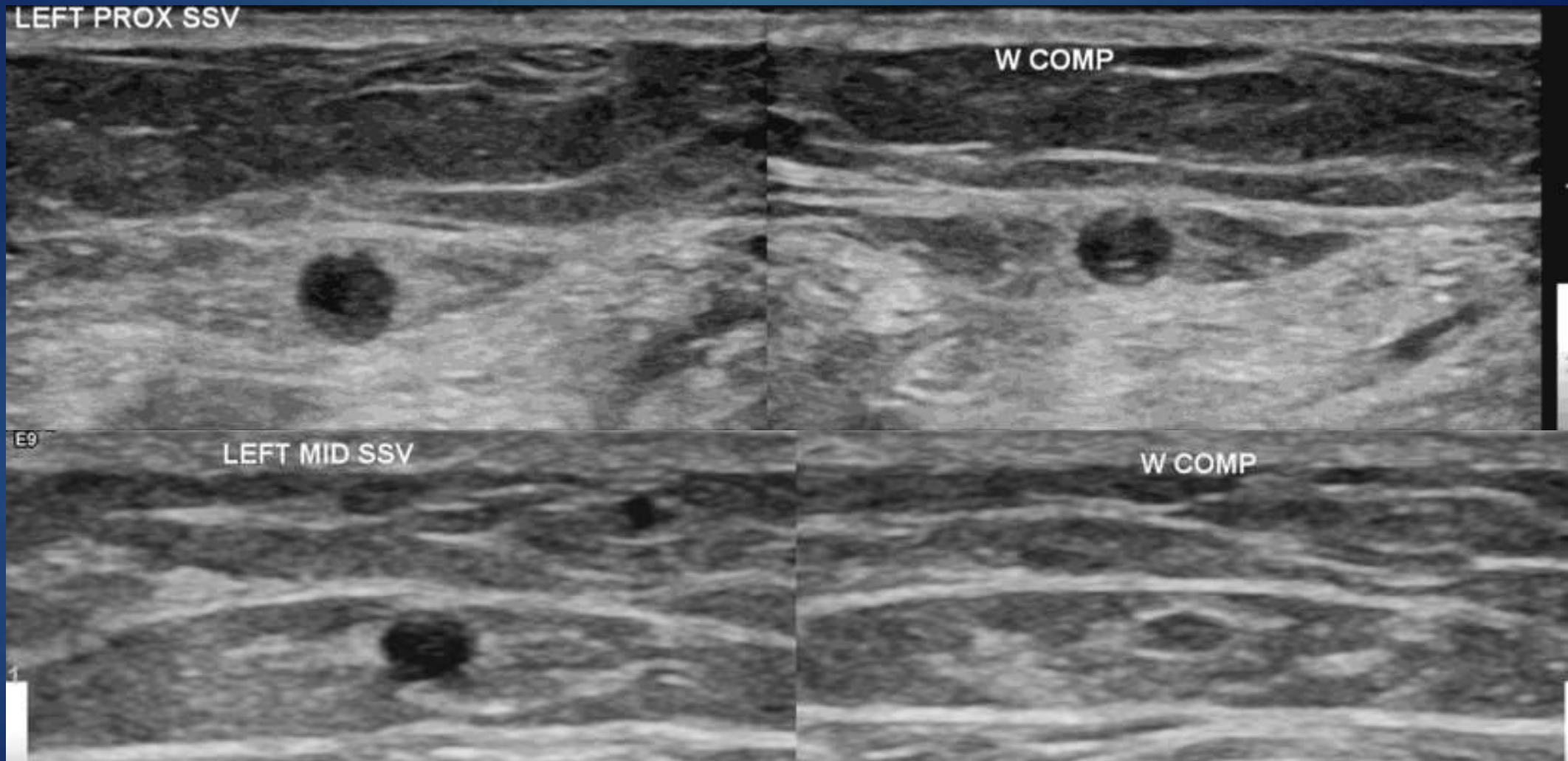
a) Pre-treatment



b) 6 months post treatment

c) 2 years post treatment

Post treatment

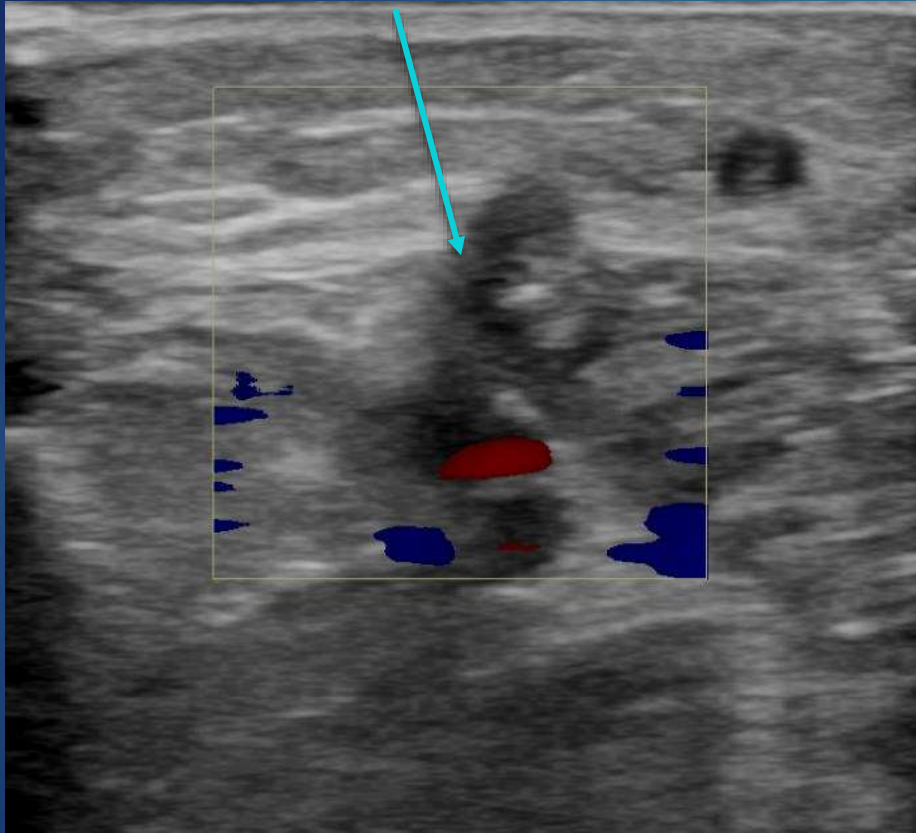


Post treatment

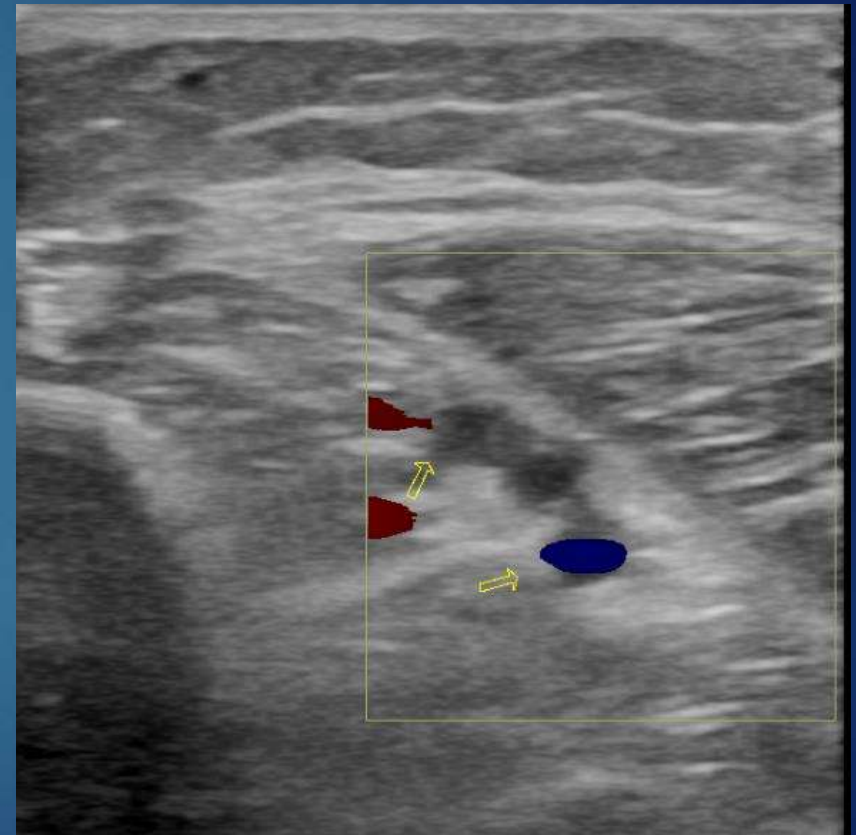


- Foam targeted tortuous branches may show mixed echogenicity, which can change over time

Perforators



Occluded perforator



Occluded posterior tibial vein

Vein treatment vs. phlebitis

- ▶ Difficult to tell the difference. Phlebitis may appear more irregular compared to RFA/foam
- ▶ **Clinical history** is very important
- ▶ **Symptoms** of phlebitis may be different- focal symptoms of inflammation and pain. Although same just after treatment
- ▶ Accurate **reporting**- use terms like partially occluded or occluded rather than 'phlebitis'

When to refer onwards?

- ▶ STP <3cm from the SFJ is usually treated as a DVT
- ▶ After vein treatment the occlusion may begin <3cm from the SFJ, this can be normal
- ▶ **Refer to a vascular team before** referring for anticoagulation/alert medical team
- ▶ Note the echogenicity of the region, this may affect treatment decision, ?mobile thrombus

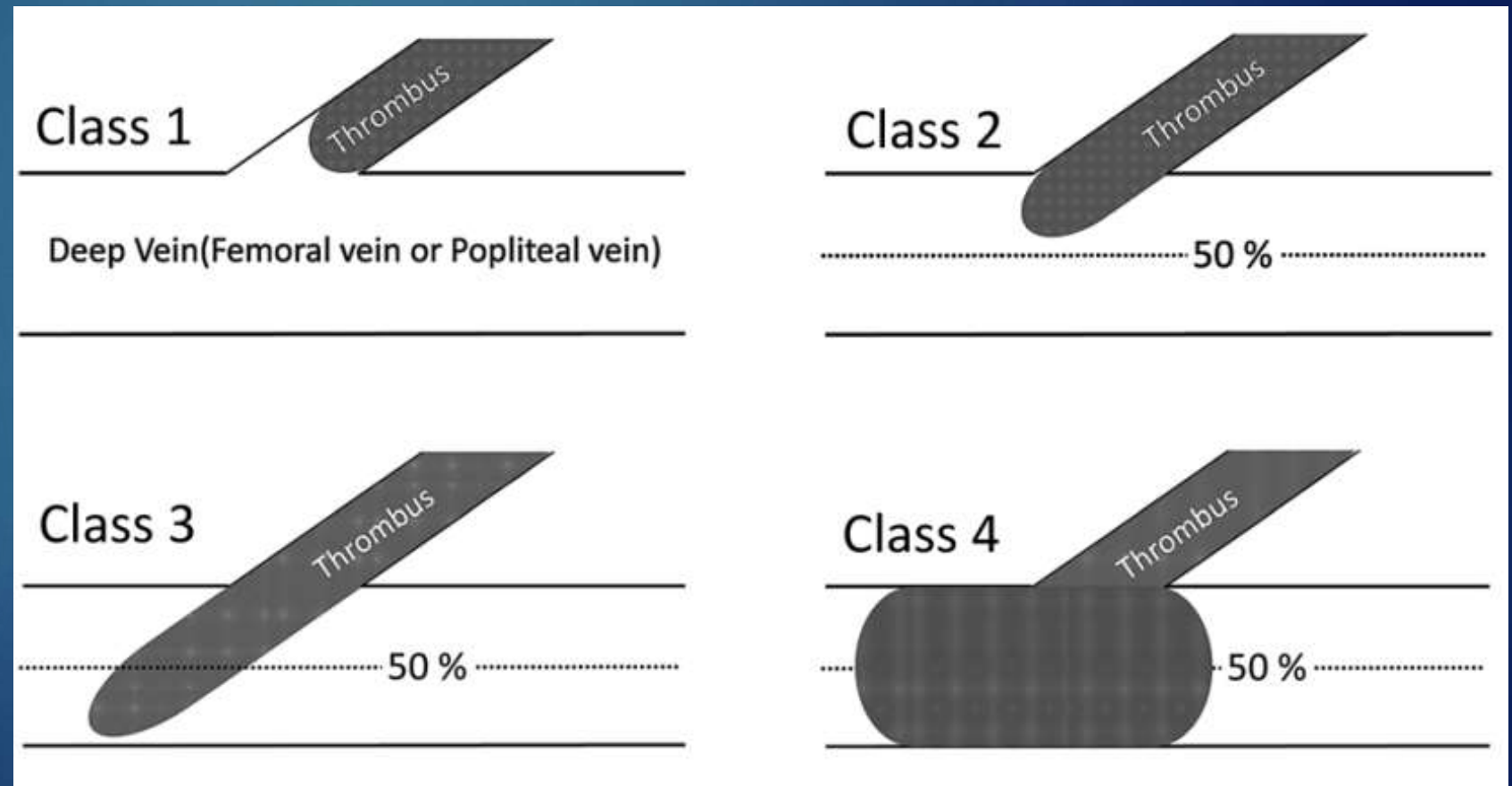
Endovenous heat induced thrombosis (EHIT)

- Propagation of thrombus into the deep vein after endothermal ablation

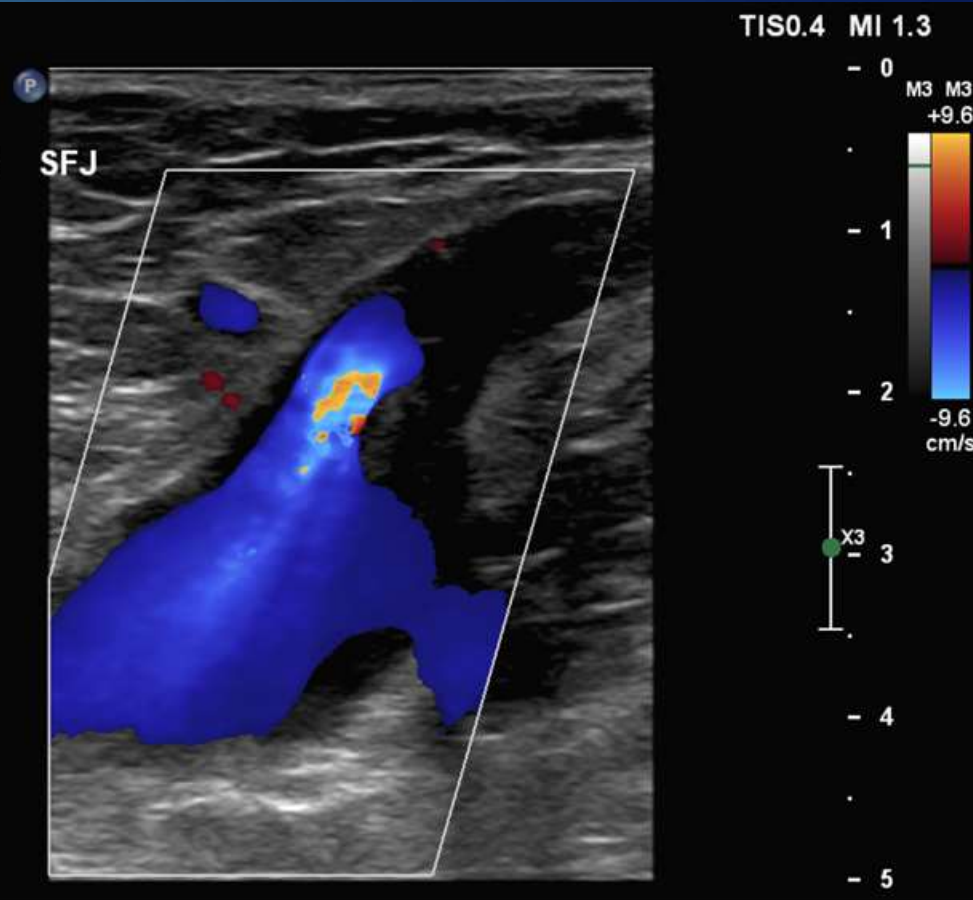
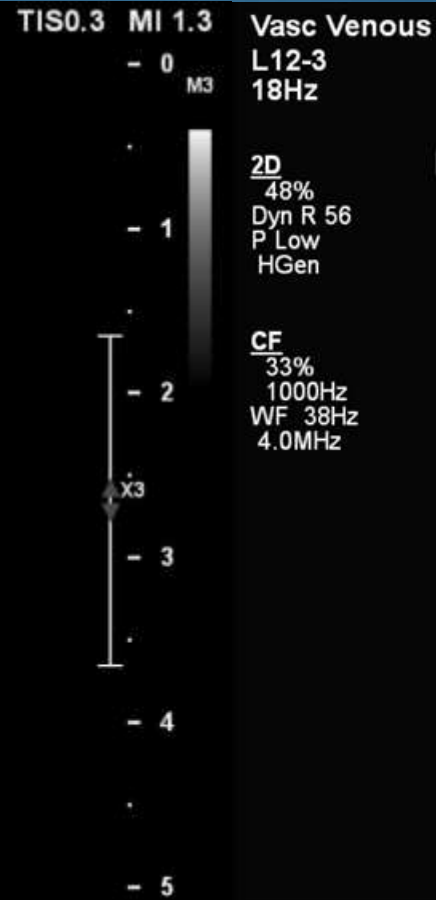
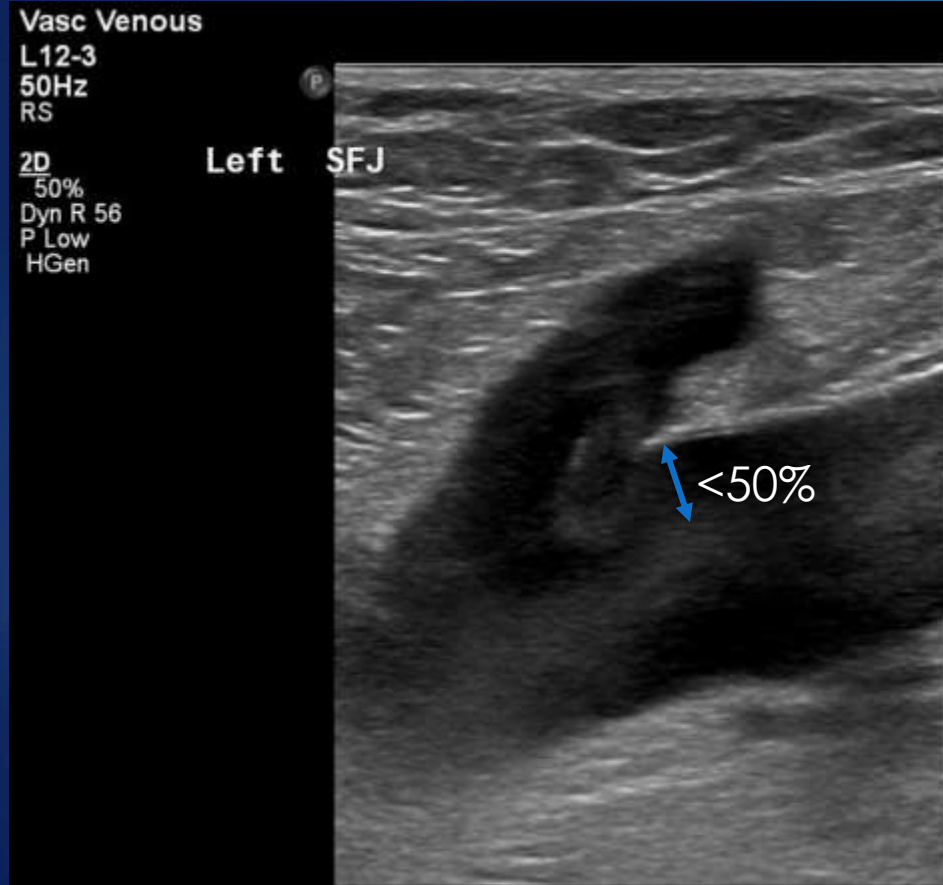
Class	Definition
1	Thrombus extended up to and including the deep vein junction
2	Thrombus propagation into the adjacent deep vein but comprising <50% of the deep vein
3	Thrombus propagation into the adjacent deep vein but comprising >50% of the deep vein
4	Occlusive deep vein thrombus contiguous with the treated superficial vein

EHIT

- Rare and should always be considered a pathological finding
- Post ablation superficial thrombus extension (**PASTE**) or ablation related thrombus extension (**ARTE**)



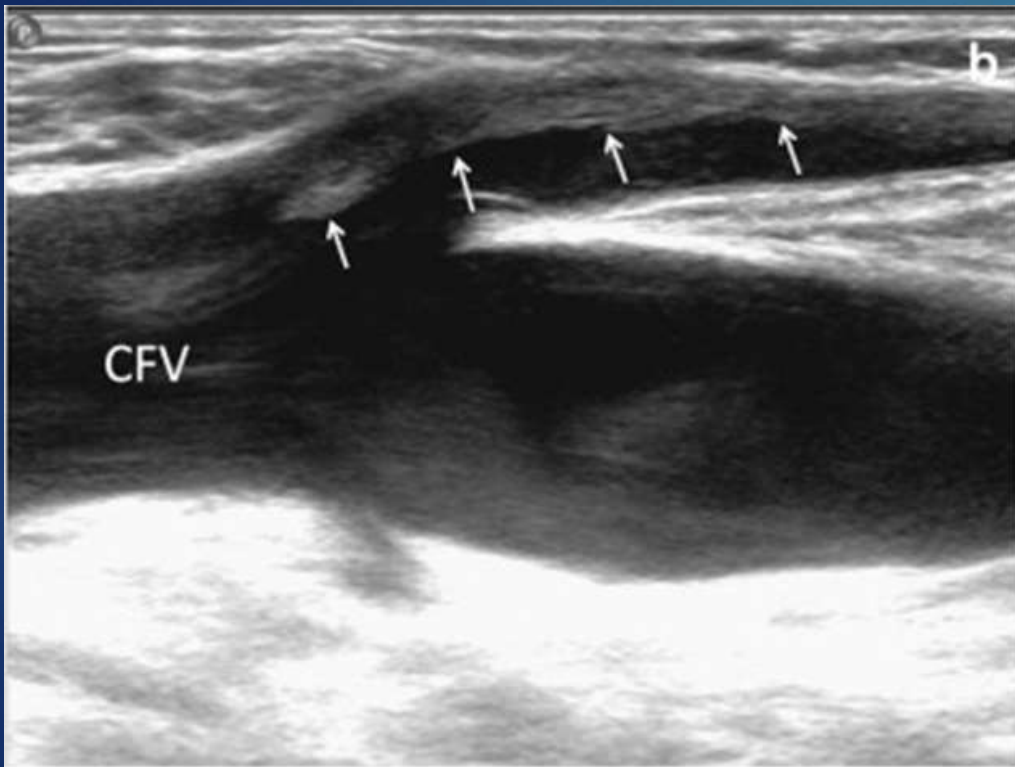
EHIT class 2



EHIT class 2



Endovenous glue/foam induced thrombosis (EGIT/EFIT)



- ▶ Thrombus extension into the CFV after cyanoacrylate glue closure or foam sclerotherapy
- ▶ < Thrombus has developed along the anterior wall of the GSV and CFV after foam treatment
- ▶ Risk factor is small diameter of the saphenous vein

EGIT

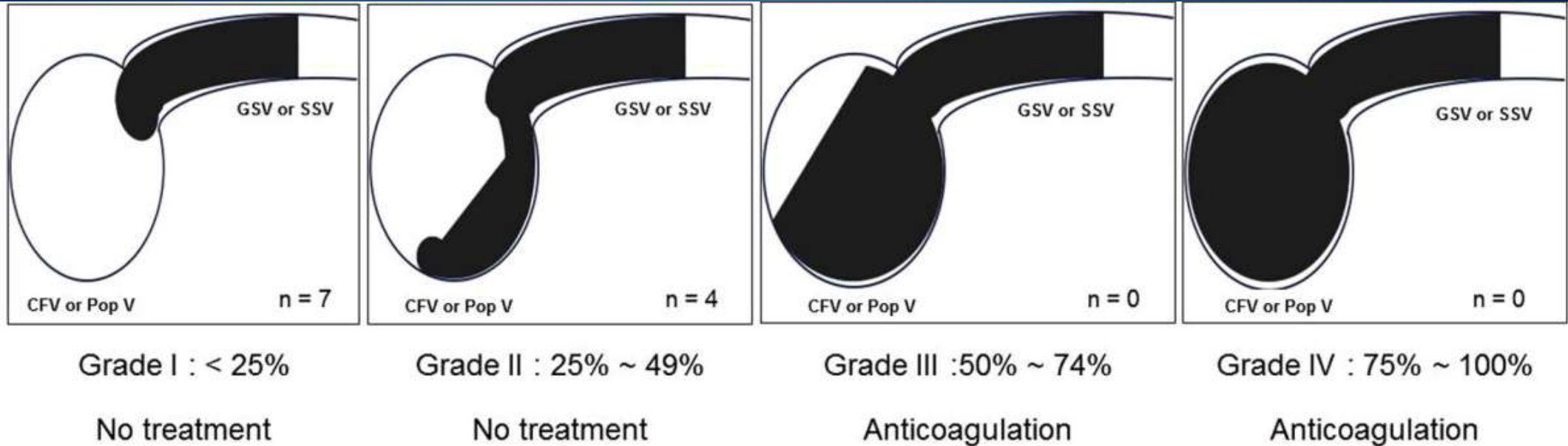


Fig 4. Classification of the endovenous glue-induced thrombosis (EGIT). **A** and **B**, The EGIT was classified as the glue-occupied area in the deep vein: total area of deep vein (*dotted circle*) and glue-occupied area (*solid circle*). *CFV*, Common femoral vein; *GSV*, great saphenous vein; *Pop V*, popliteal vein; *SSV*, small saphenous vein.



Key takeaways

- ▶ Check **clinical history**, particularly when phlebitis is seen
- ▶ **Report** as occluded/partially occluded rather than 'phlebitis'
- ▶ Ensure visible **perforators** are patent
- ▶ Look for **EHIT/EGIT/EFIT**
- ▶ If in doubt, check with the vascular/medical team. Ensure they are aware patient may have had vein treatment

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