

Varicose Veins

Reem Mosaad Soliman

*Assistant lecturer of vascular surgery, Mansoura
University*

Surgical Anatomy of the Lower Limb Veins

I. Superficial Veins

Long & Short saphenous veins & their tributaries

Communicating Veins

II. Deep Veins

Tibial venae comitantes, popliteal & femoral veins

Superficial Veins

1. Long & short saphenous veins *and* their tributaries.
2. Lie in the subcutaneous tissue superficial to the muscle fascia.
3. They have their own, well-developed muscle coat.



The Long Saphenous Vein

The longest vein in the body

Surface Anatomy

- 1 cm anterior to the medial malleolus
- One hand breadth posterior to the medial aspect of the patella
- Ends on the anteromedial side of the femoral vein 3.5 cm below & lateral to the pubic tubercle

It receives the following tributaries near its termination:

- Superficial & deep external pudendal vv.
- Superficial circumflex iliac v.
- Superficial inferior epigastric v.



The Short Saphenous Vein

Anatomy

- **Behind the lateral malleolus**
- **Pierces the deep fascia before it enters the popliteal vein**
- **Invariably terminates above the popliteal fossa into the superficial femoral vein**
- **Communicates with the long saphenous vein by several channels**

Surgical Anatomy of the Lower Limb Veins

Deep Veins

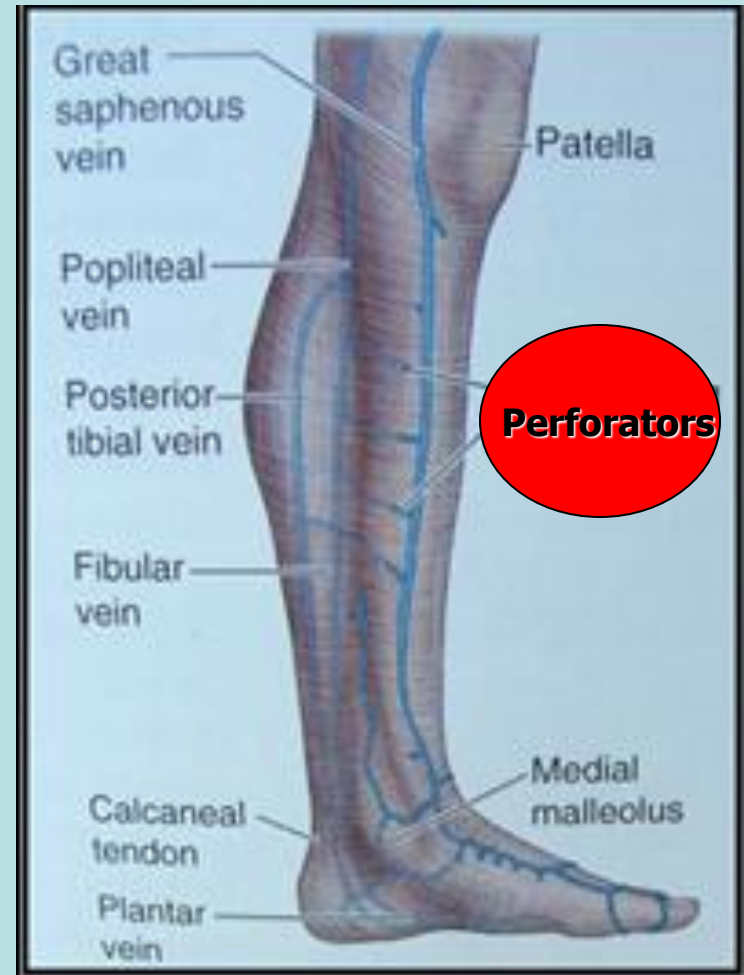
1. Accompany axial arteries.
2. Run within the muscles *deep to the muscle fascia.*



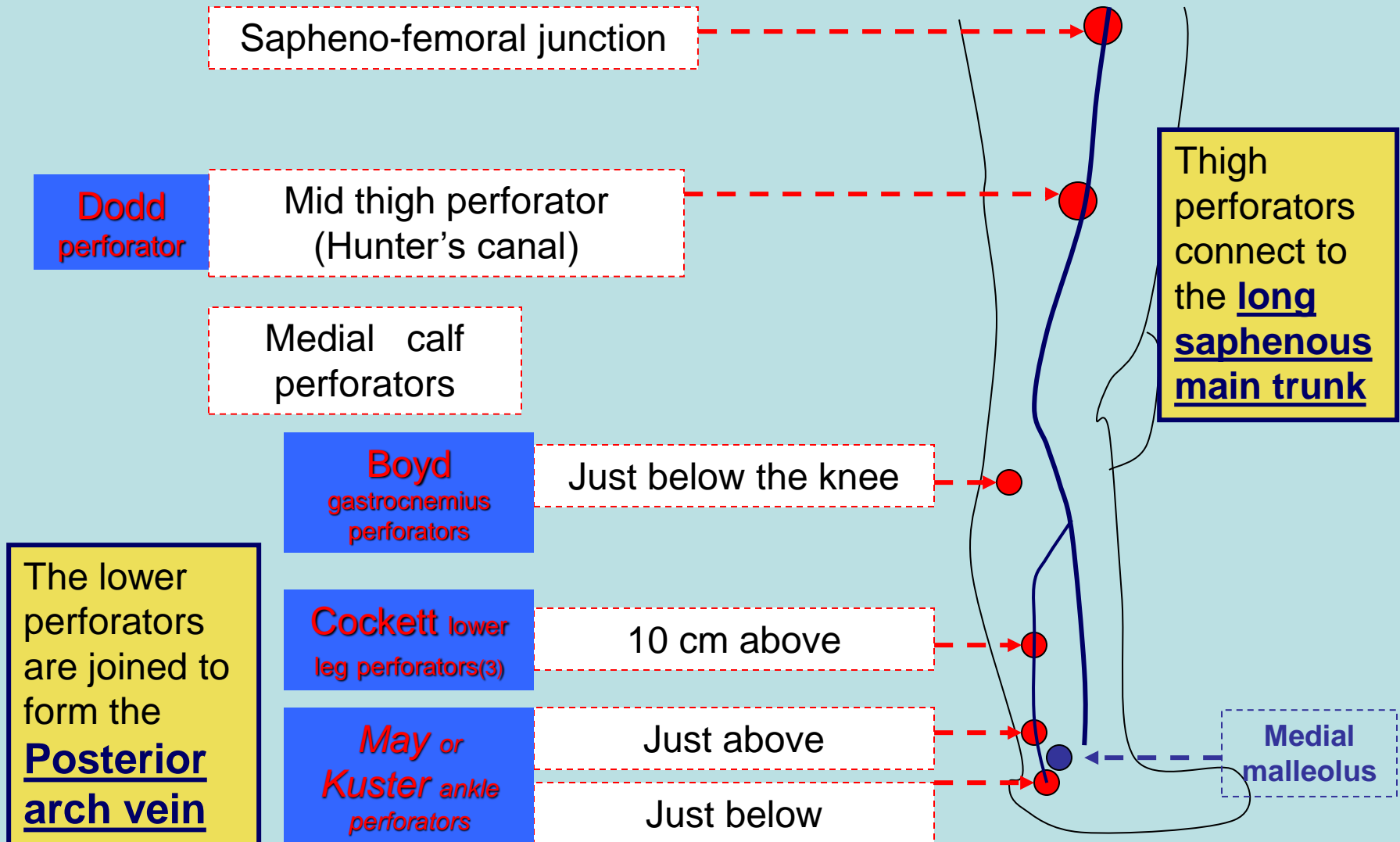
Surgical Anatomy of the Lower Limb Veins

Communicating Veins "*Perforators*"

Perforate the fascia connecting the superficial & deep veins at certain points.



Main sites of superficial to deep venous communication

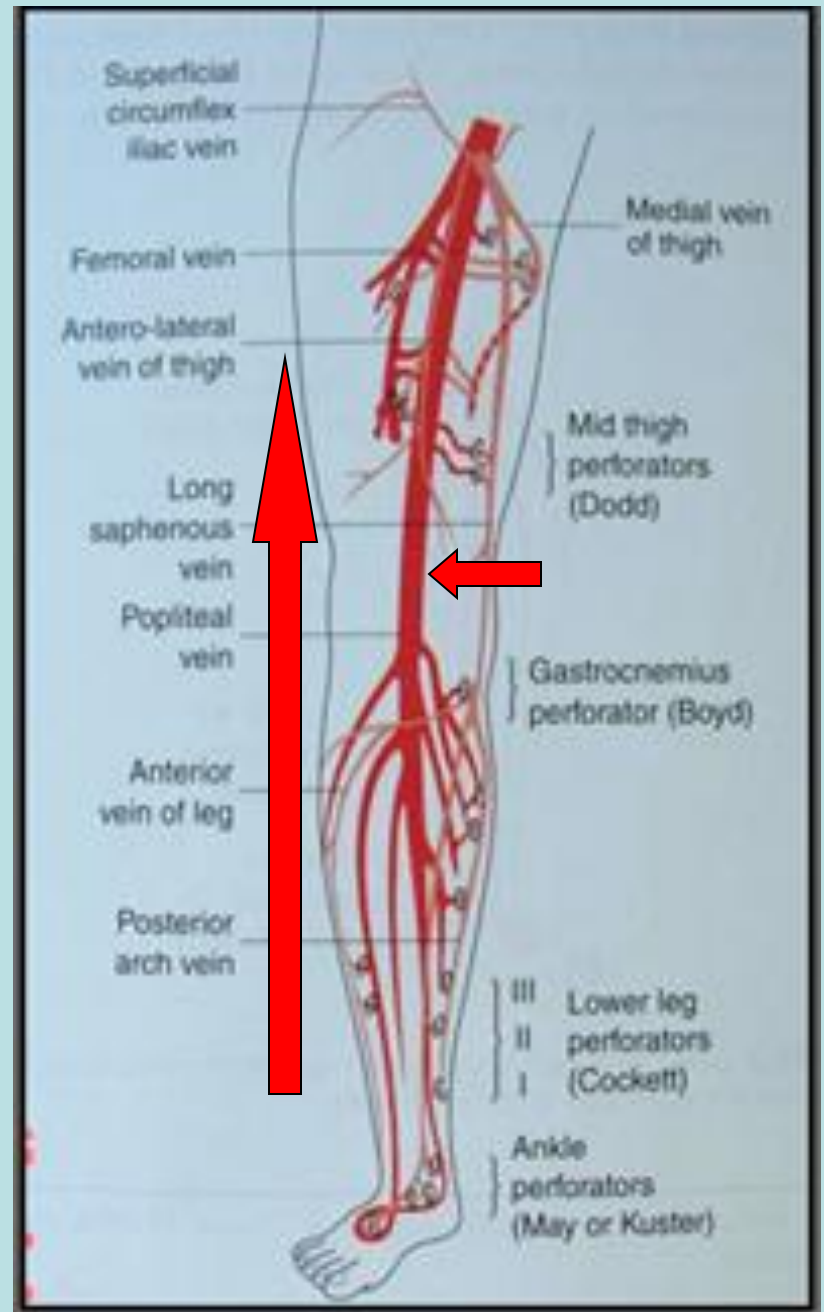


Surgical Anatomy of the Lower Limb Veins

All lower limb veins have valves to direct venous return in one direction only

From below upwards,

and from superficial to deep.



Venous return

With dependency

The heart pump

maintaining a **pressure gradient** across the veins

Gravity

Pooling in dependent limbs may reduce cardiac output by 2 L/min & may cause fainting

Venomotor tone

Under control of sympathetic system

*[Upright position -- dependant pooling – dec. cardiac output
-- inc. sympathetic discharge -- inc. venous tone -- inc.
venous return.]*

This is counter acted by:

Calf muscle contraction

Blood is pushed upwards
and prevented from retrograde flow by competent venous
valves

*With calf muscle contraction in
walking*

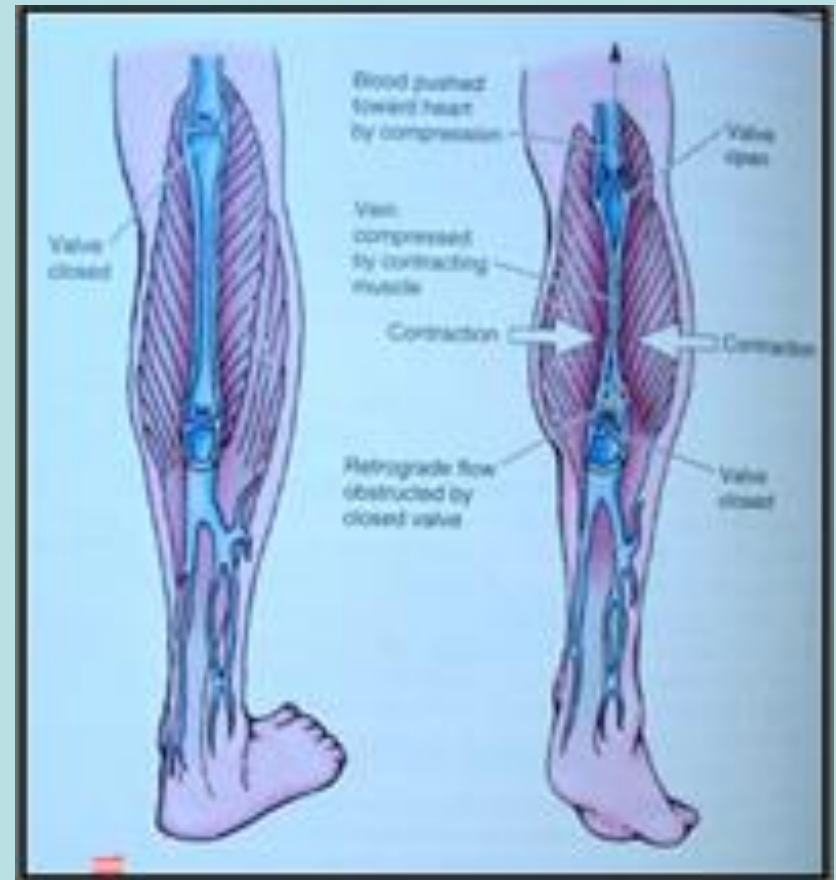


Competent Veno-muscular Pump is composed of:

1. Superficial & deep veins with competent valves.

2. Competent perforating veins communicating the deep & superficial systems

3. Powerful lower limb muscles.

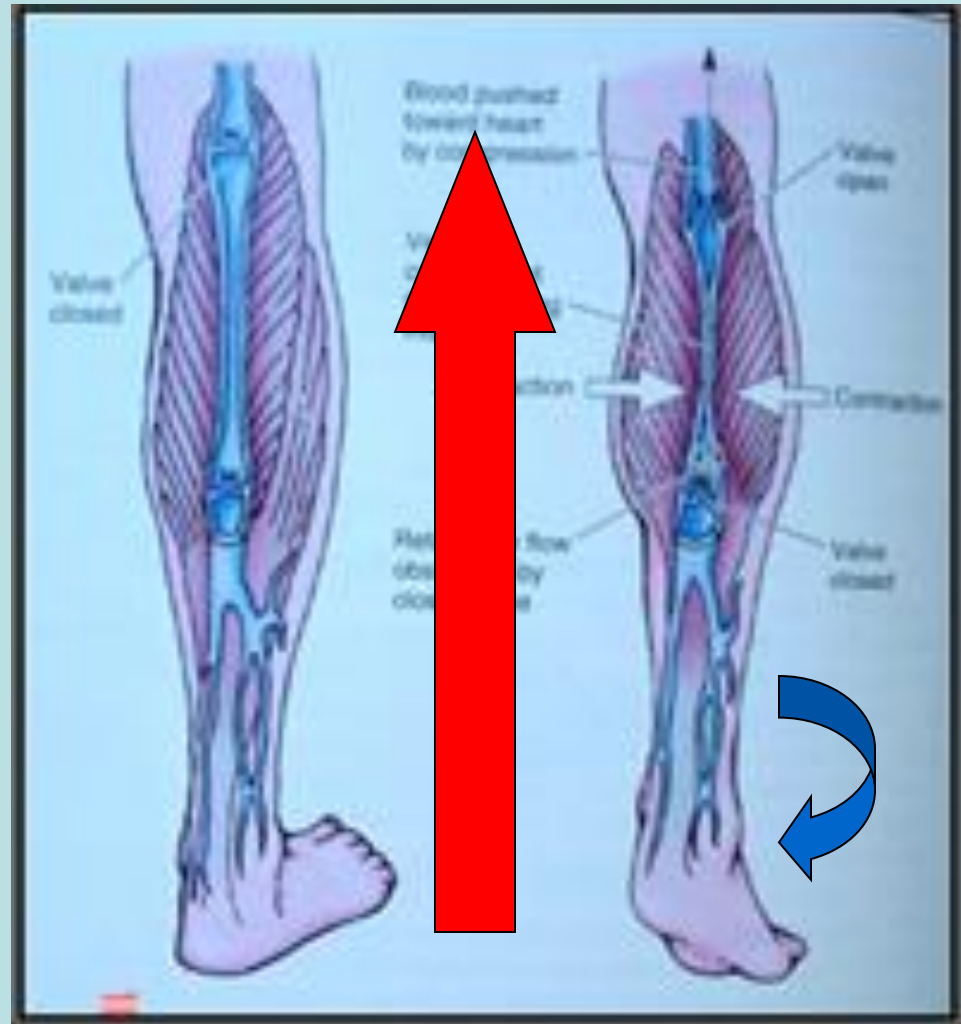


Definition

The ankle venous pressure during walking is called the ***"ambulatory venous pressure"***

**A competent
veno-muscular
pump will push
the blood
towards the
heart,**

**thus lowering
the ambulatory
venous
pressure.**



Definition

CVI collectively describes the manifestations of ***impaired venous return*** due to abnormal venous system function.

In the majority of cases, it is caused by ***valve incompetence,***

and less commonly by ***venous obstruction.***

Patho-physiology of CVI

The main defect (*problem*) in the lower limb venous system may be in the **superficial, deep or perforating veins.**

This problem is usually in the **valves (reflux)**, but sometimes it is in the form of **obstruction**. (*or a combination of both reflux & obstruction*)

Patho-physiology of CVI

The defect may be:

Primary defect: related to structural weakness of valves *or* venous wall, as in 1ry varicose veins

Secondary defect: *for example* due to previous deep venous thrombosis, as in post-phlebitic syndrome

Patho-physiology of CVI

Whatever the cause of CVI, it will eventually cause *venous hypertension of the microcirculation*, giving the **same** symptoms & signs.

The **severity** of symptoms & signs depend on the **degree & duration** of venous hypertension.

**When veins fail,
the
microcirculation
suffers.**

Symptoms & Signs of "CVI"

Early

1. Posture related discomfort
2. Lower limb oedema
3. Muscle cramps

Persistent & Sever

4. Ankle brown pigmentation
5. Venous eczema
6. Lipodermatosclerosis
7. Venous ulcer

Clinical Examination

The patient should be standing

Look for:

The extent and distribution of VV



Long saphenous
VV



Antro-lat. tributary
of LSV



Short saphenous VV



Communicating
vein varicosity

Clinical Examination

Look for:

Scars of previous op.



Pigmentation



Lipodermatosclerosis



Some ulcers may potentially bleed

Clinical Examination

Palpate for:



Feel for saphena varix
(1cm medial to the
femoral a.) & a
transmitted cough
impulse



Dilated short saph v.
suggestive of saph-pop
incompetence



Indurated tender veins
suggestive of
thrombophlebitis

Test for incompetence

Brodie – Trendelenburg test



Let the patient stand

If the veins remain empty, but fill **after removal of tourniquet**, the incompetence must be above the tourniquet



If the veins fill **before removal of tourniquet**, the incompetence must be below the tourniquet

Perthes' walking test



Place a tourniquet around the thigh while the patient is standing (*note that the vv are full*)

Let the patient walk in place

If the veins empty with walking, then the tourniquet is preventing superficial reflux from an incompetent valve above, while **deep veins are patent with intact valves.**

Investigations of Venous Disease

Investigations have two aims:

1. Identify the existence, site & degree of **venous reflux**.

2. Confirm **deep venous patency**.

Identification of venous reflux:

1. Doppler Ultrasound: portable bedside examination

It is accurate in detecting *sapheno-femoral* reflux in the groin.

- Hold the Doppler probe on the groin and detect the venous signal
- Squeeze the calf. This will augment the signal
- If the SFJ is incompetent, you will hear a **biphasic** signal due to retrograde flow

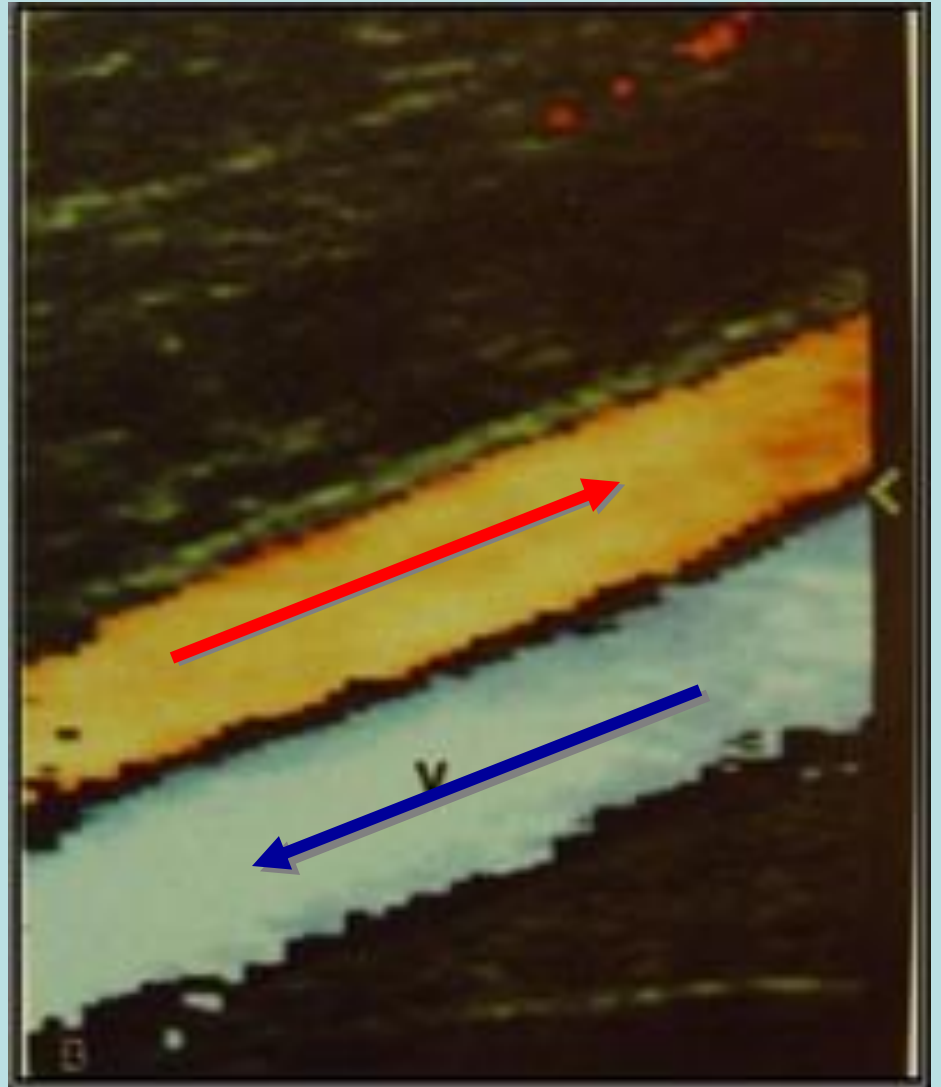
Identification of venous reflux:

2. Coloured Duplex Ultrasonography:

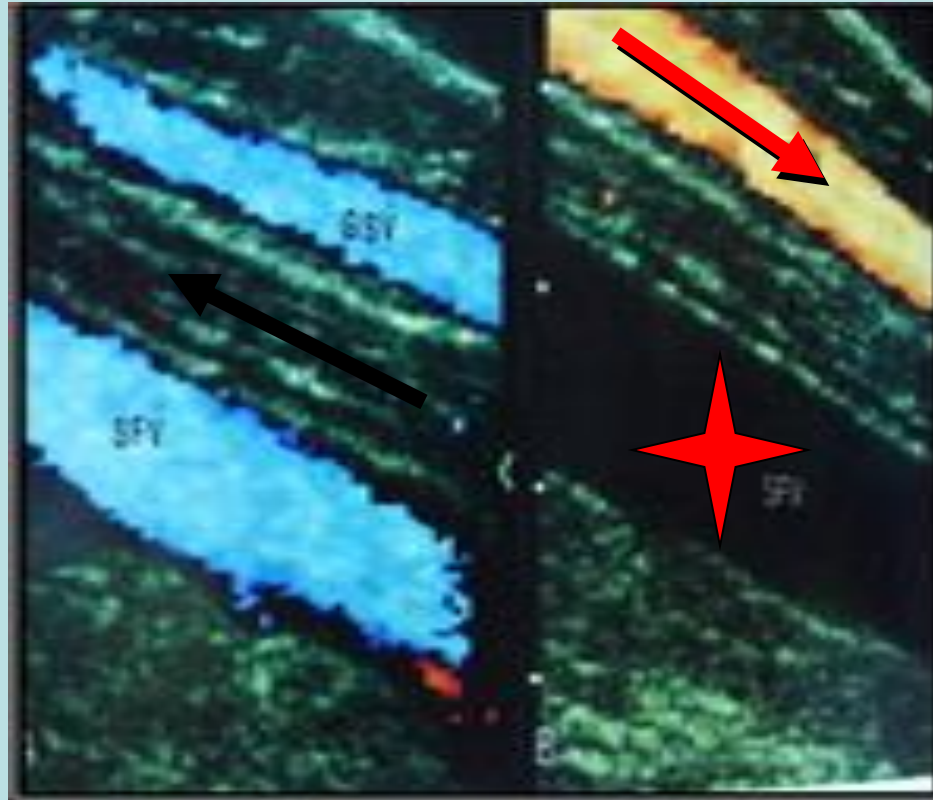
1. Visually demonstrates venous reflux into the superficial and deep veins.
2. The degree of venous reflux can be assessed.
(Dynamic Study)
3. Can detect incompetent perforators.

Coloured Duplex Ultrasonography

The colour reflects the
direction of
blood flow



Coloured Duplex Ultrasonography



Normal direction of
venous return

With straining:

Reflux into the GSV with arrest
of flow in the femoral vein
(competent deep system)

Identification of venous reflux:

3. Photoplethysmography:

Gives a *global* idea about the existence & degree of reflux as a whole

4. Descending venography:

Mainly used to detect reflux into the deep veins. It is a *static study*, and is now replaced by colour duplex.

Confirming Deep Venous Patency:

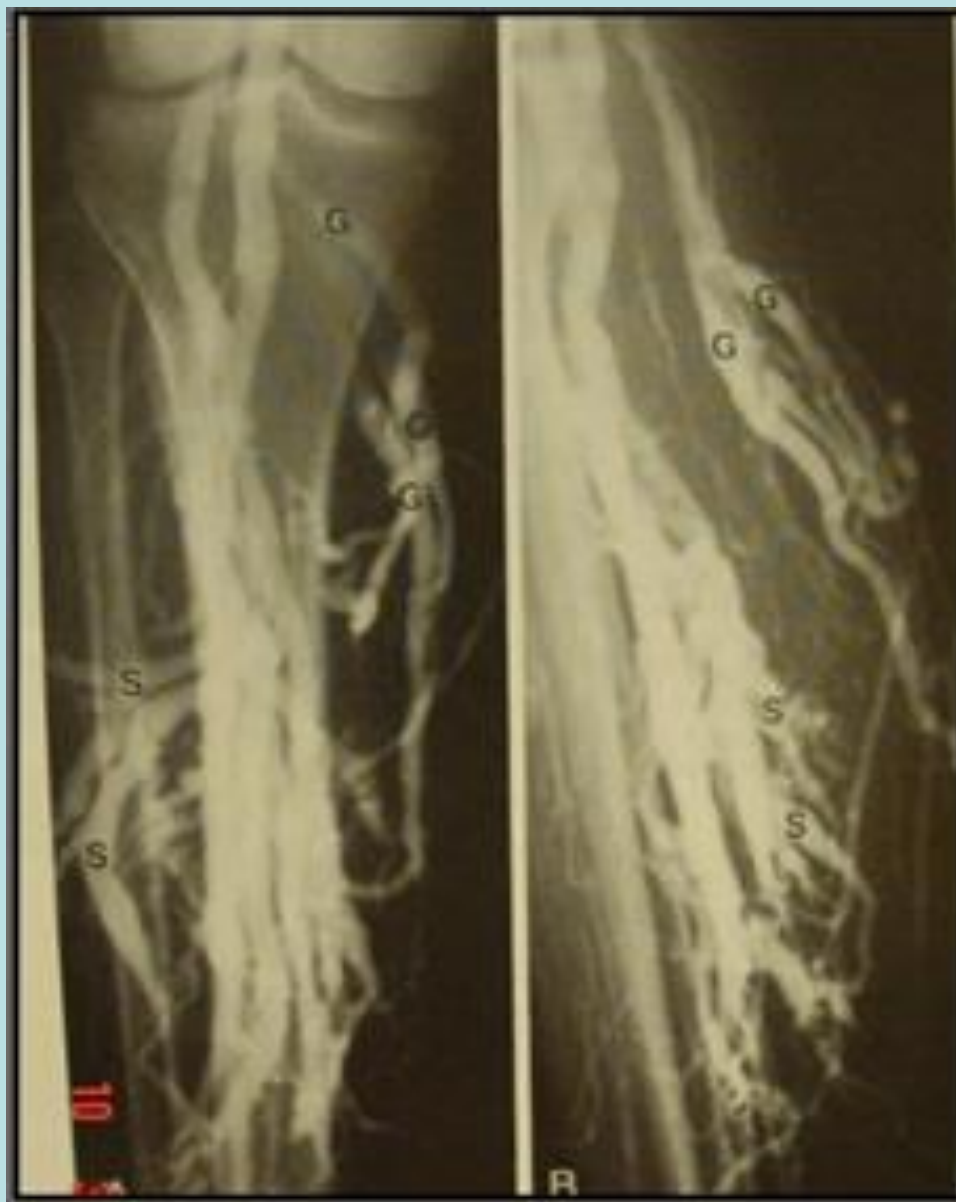
As in patients with suspected post-phlebitic syndrome (*chronic complication of maltreated DVT*)

1. Duplex Ultrasound

2. Ascending Venography

Normal Ascending Venography

A.P.



Lat.

Management of 1ry VV

Minor VV

Support
stocking

Injection
compression
sclerotherapy

Trunk VV (long or short saphenous) with incompetence

Sapheno-femoral / sapheno-popliteal ligation with stripping of the long or short saphenous vein.

(no need to strip the long saph. In the leg)

*Branch
Varicosities*

Avulsion/ligation via multiple stabs

*Incompetent
perforators
(detected by Duplex)*

Individual ligation

Thank You