

Dr. Ankita A. Sulkekar  
(B.A.M.S., M.S.)  
Assistant professor  
shalyatantra dept.

## VERICOSE VEIN

Definition – when a vein become dilated, elongated and tortuous , the vein is said to be vericose.

Site – commen sites of vericosity

1. Superficial venous system of the lower limb – affecting either the long saphenous or short saphenous vein or the both.
2. Oesophagal varix (affecting veins of the gastro-oesophagal junction).
3. Varicosity of the haemorrhoidal veins. (piles)
4. Varicosity of the spermatic vein (varicocele).

# Surgical Anatomy –

- ▶ Venous drainage of the lower limbs can be conveniently described under 3 heads – 1). Deep veins
- ▶                               2). Superficial veins
- ▶                               3). Perforating or communicating veins, which connect the superficial with deep veins.
- ▶ 1). Deep veins – the deep veins of the lower limb accompany the arteries and their branches. These veins possess numerous valves. The main veins are – the posterior tibial vein and its tributaries, the peroneal veins, the anterior tibial vein, the popliteal vein and the femoral vein.

- ▶ Long (Great) saphenous vein –
  - Longest vein in the body
  - It begins in the medial marginal vein of the foot and ends in the femoral vein about 3cm below the inguinal ligament.
  - It ascends in front of the tibial malleolus, runs upwards crossing the lower part of medial surface of the tibia obliquely to gain its medial border.
  - In case of varicosity of the long saphenous vein, the small veins from the sole of the foot and ankle which drain into this venous system through the medial marginal veins become dilated and this gives rise to swelling of ankle, which is known as 'Ankle Flare'.

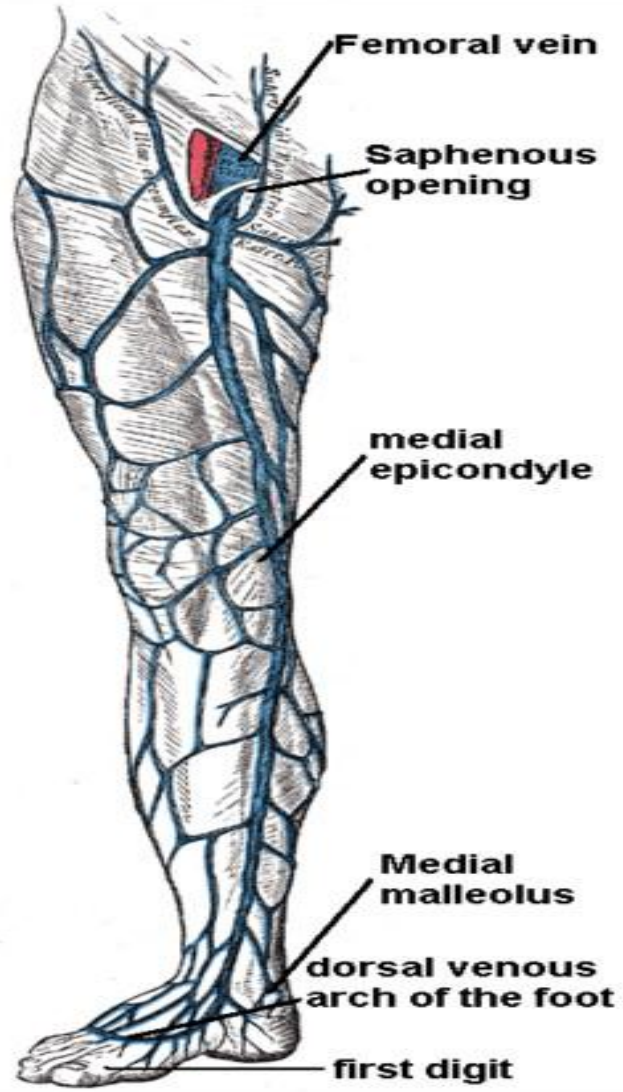
# Short (small) saphenous vein -

- ▶ This vein begins at the lateral malleolus as a continuation of the lateral marginal vein of the foot. It first ascends along the lateral border of the tendo achilles and then along the midline of the back of the leg. It perforates the deep fascia and passes between the two heads of the gastrocnemius in the lower part of the popliteal fossa and ends in the popliteal vein 3 to 7.5cm above the level of the knee joint.

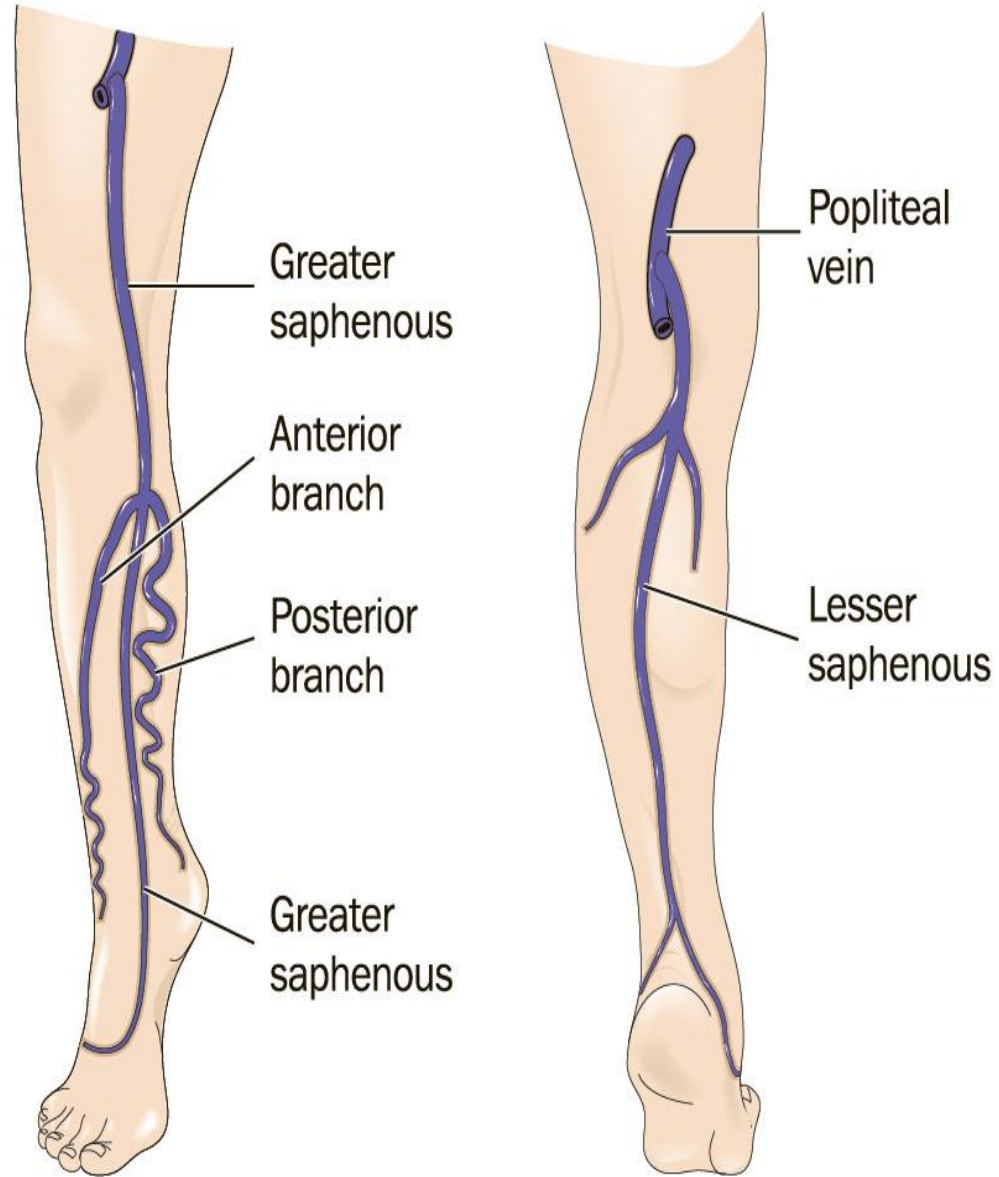
Perforating or communicating veins –

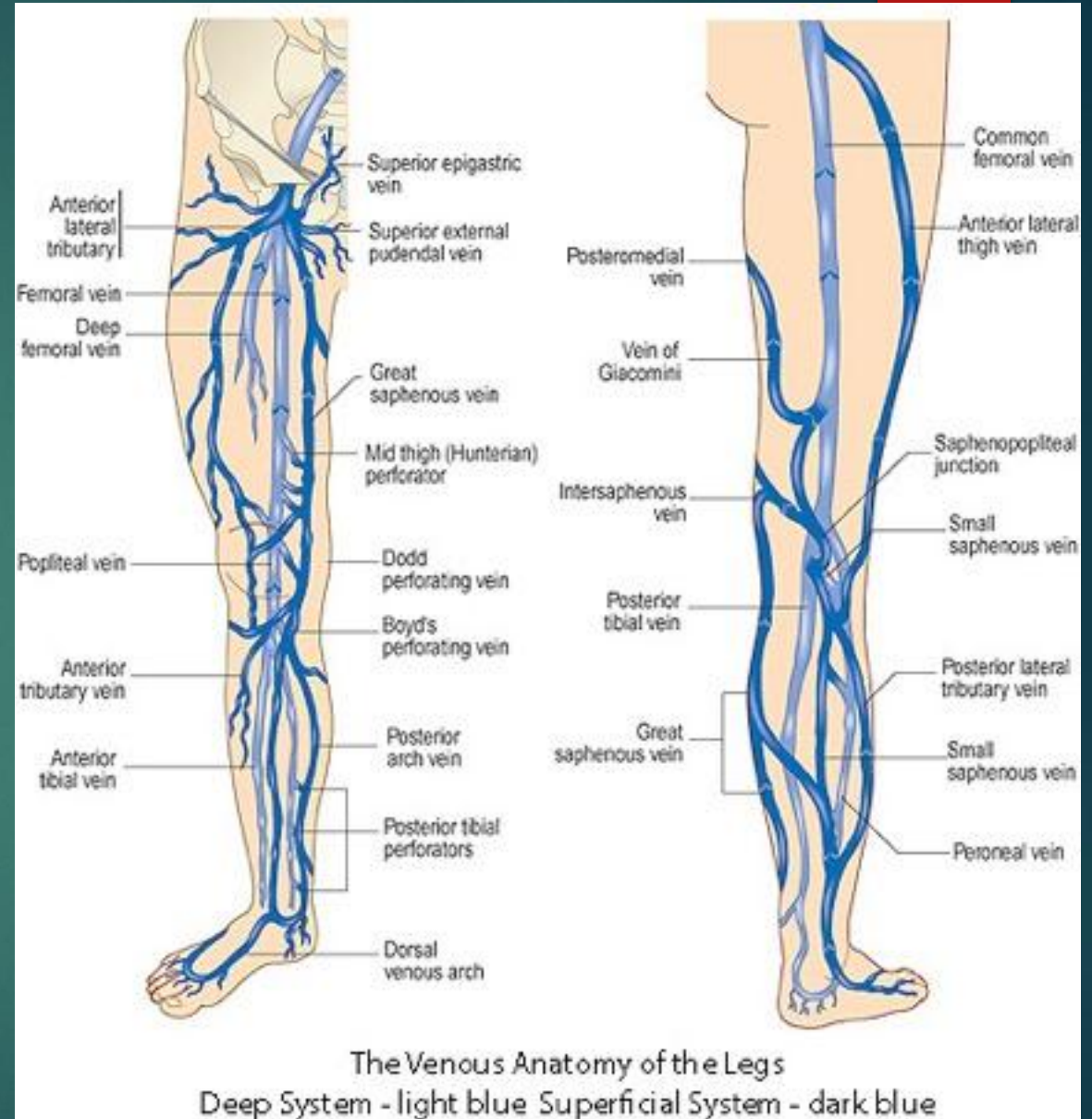
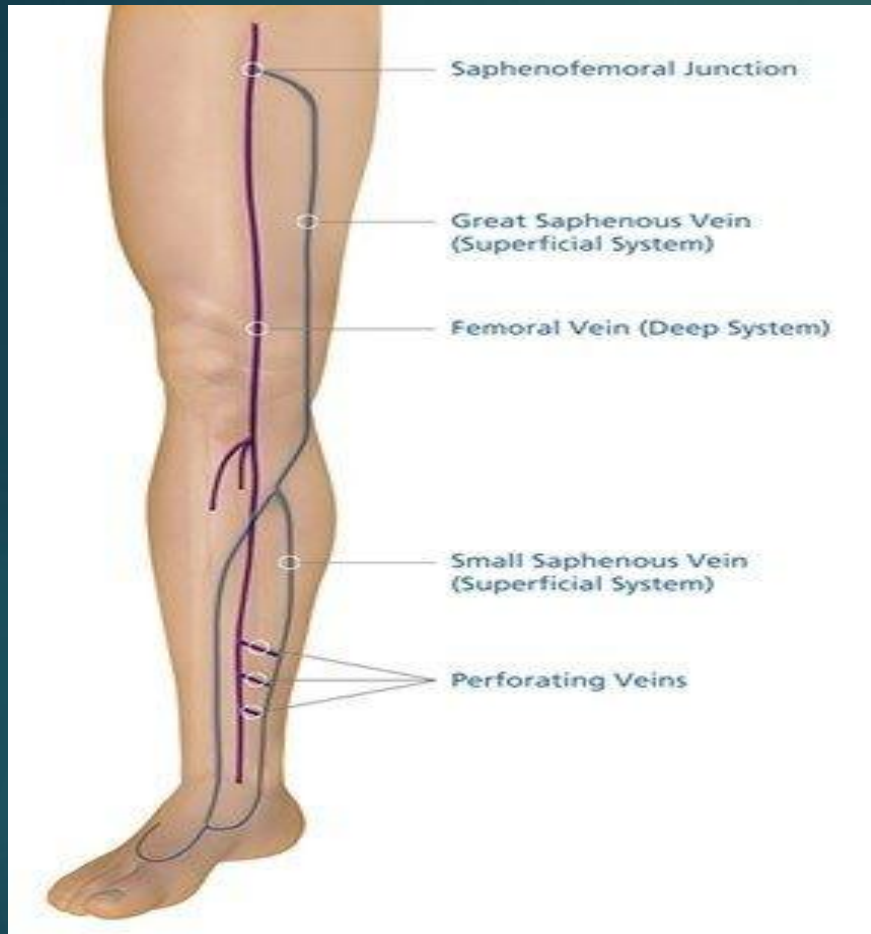
Veins communicate between the superficial and deep veins.

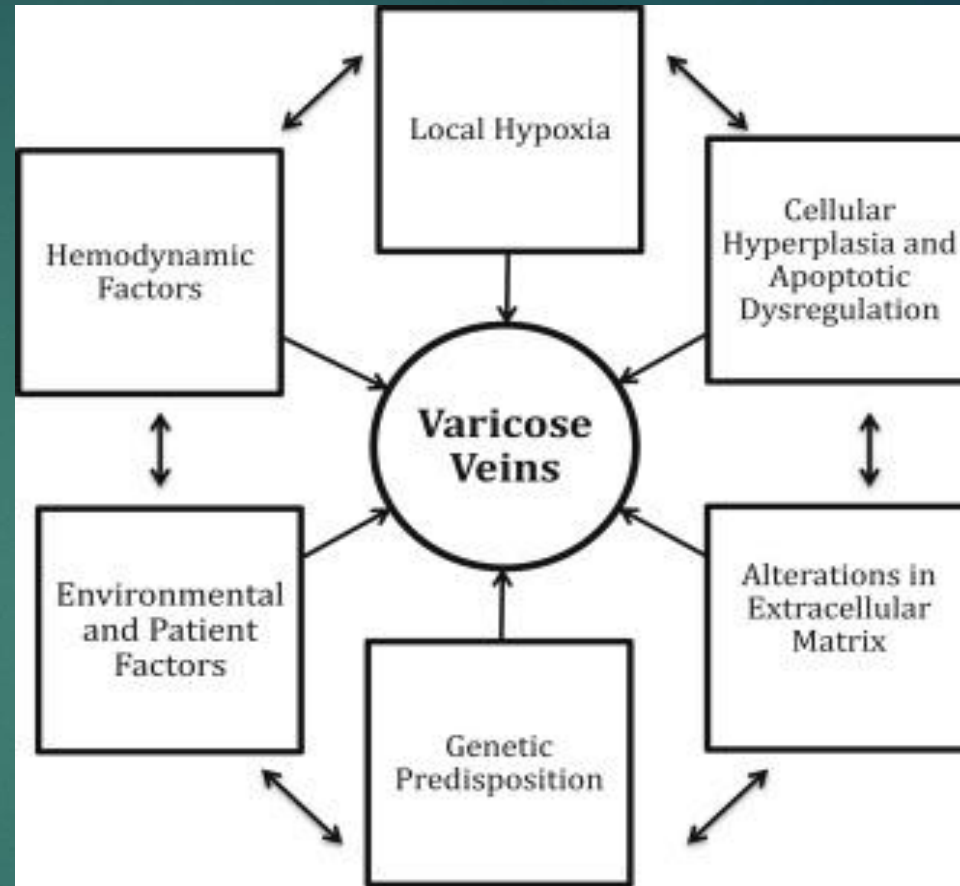
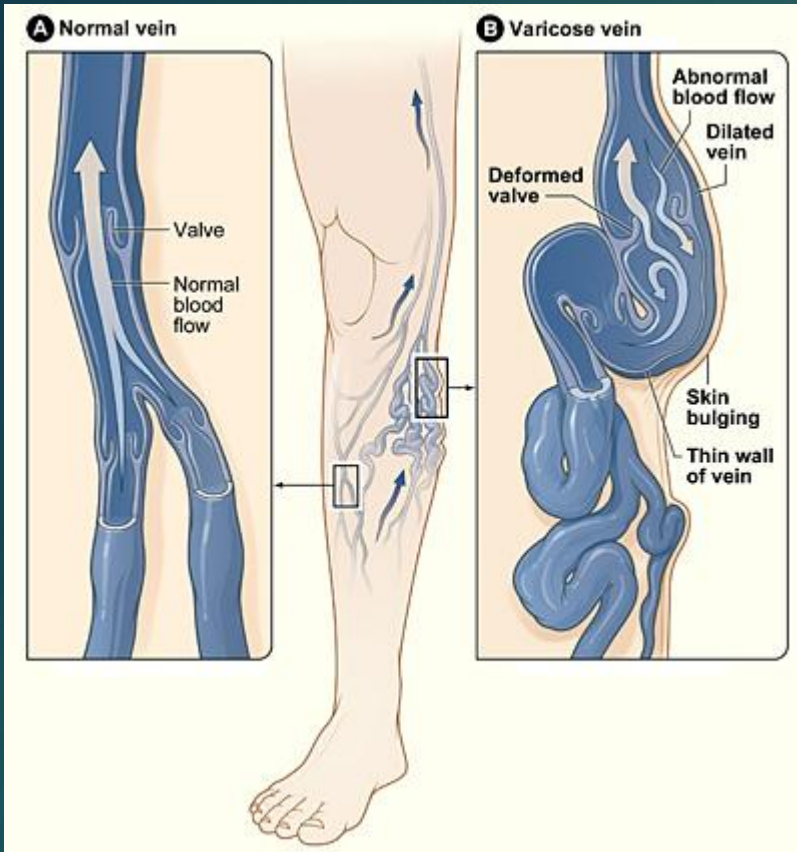
### Great saphenous vein



The great saphenous vein and landmarks along its course









# Aetiology -

1). Morphological Factor – veins of the lower limbs are the penalty the man has to pay for its erect posture. The veins have to drain against gravity. Superficial veins have loose fatty tissue to support them and thus suffer from varicosity. There are three types of varicosity – primary varicose vein, secondary varicose veins, and congenital v.v.

2). Primary varicose veins – more common. This condition due to defect in the valves. Defect may be congenital or acquired ( either due to thrombosis or inflammation in the veins)

- Defect in the saphenofemoral valve leads to varicosity of the long saphenous veins
- Defect in the saphenopopliteal valve leads to varicosity of the short saphenous veins.
- Defect in the valves of the perforators leads to varicosity of either long or short saphenous system.

3). Secondary varicose veins – occurs due to venous obstruction eg.

- Mechanical factors – pregnancy, tumours in pelvis uterus , ovarian cyst, CA cervix, uterus, ovary, rectum.
- Deep vein thrombosis leading to damage of the valves.
- Hormonal causes – progesterone may cause varicosity in multiparous womens.
- acquired arteriovenous fistula
- Extensive cavernous (venous) haemangioma.
- Retroperitoneal lymphadenopathy
- Iliac vein thrombosis

4). Congenital vericose veins – v.v. develops below 20yrs. These cases are mostly due to either congenital arteriovenous fistula or venous haemangioma

# Predisposing factors -

1). Prolonged standing – weakened valves of veins, calf muscle weakness

2). Obesity – poor support to veins due to fats leads to v.v.

3). Pregnancy – progesterone causes dilatation and relaxation of the veins of the lower limb. This may make valve incompetent. This maximum found in 1<sup>st</sup> trimester.

Due to pregnancy causes press. On inf. vena cava causes obstruction in venous flow. This is found mostly in last trimester

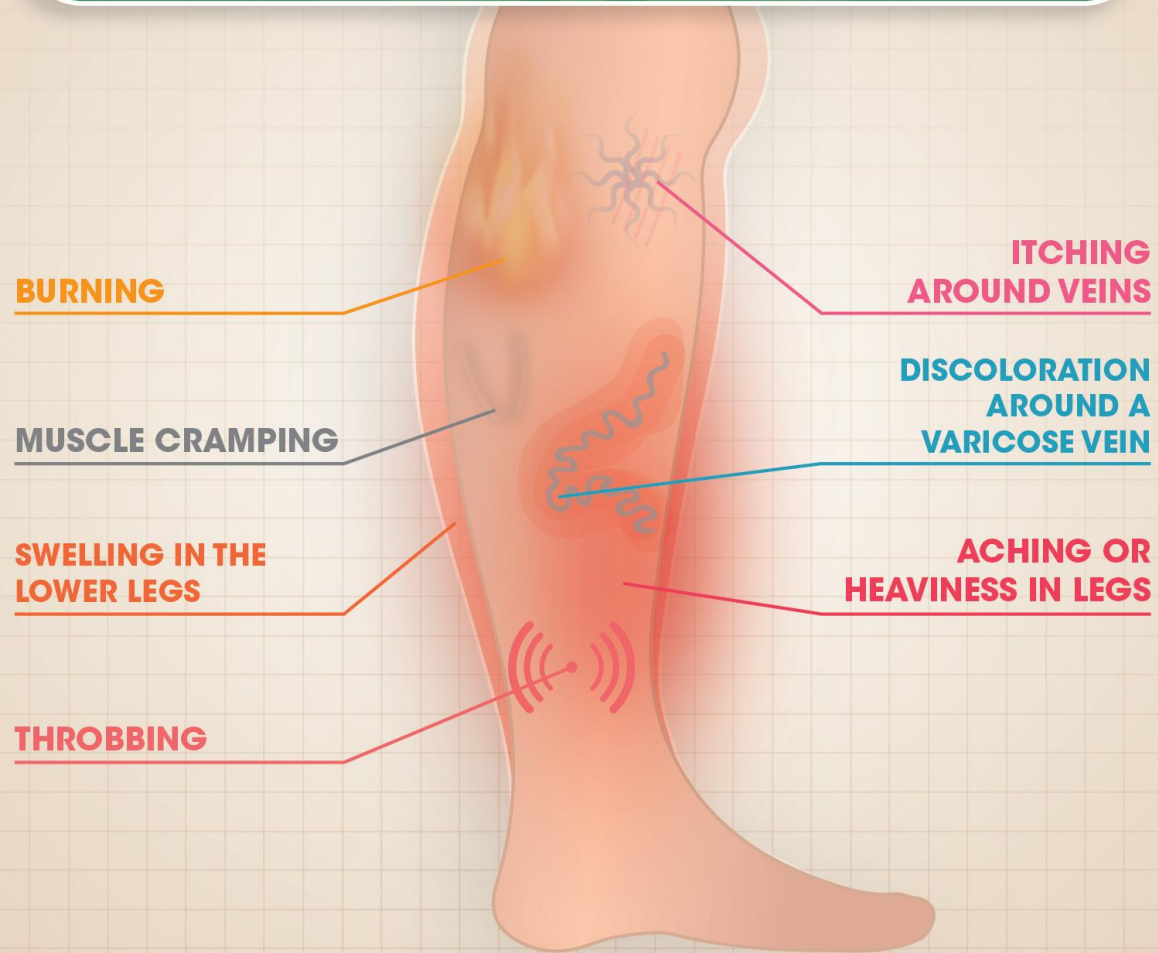
4). Old age – causes atrophy and weakness of vein wall, due to aging the valves in the veins become gradually incompetent

5). Athletes – forcible contraction of the calf muscles may force blood through the perforating veins in reverse direction. This will cause destruction of the valves of the the perforating veins and ultimately lead to formation of v.v.

# Clinical features – symptoms –

- ▶ Tired and aching sensation in the affected lower limb, particularly in the calf, at the end of the day
- ▶ Sharp pain may be complained of in grossly dilated veins.
- ▶ Cramp in calf muscle
- ▶ Pain while walking indicate deep vein deficiency
- ▶ Dilated and tortuous veins
- ▶ Ankle swelling towards evening
- ▶ Skin over the varicosities may itch may be pigmented
- ▶ Eczema of affected skin
- ▶ Venous ulceration

# SYMPTOMS OF VARICOSE VEINS



# Local Examination –

- ▶ 1). Cough impulse
- ▶ 2). Brodie- Trendelenburg test – test is performed to determine incompetency of saphenofemoral valve and other communicating system.
  - Recumbent position = raise the leg empty veins = saphenofemoral junction with thumb = patient ask to stand up quickly = 1), pressure release varices fill very quickly by blood indicate incompetency of saphenofemoral valve = 2). Pressure is not realse maintain for 1 min gradually filling veins incompetency of communicating veins.
  
- 3). Tourniquet test – is is called variant of trendelenburgs test
  - Toruniquete tide around thigh or different position on leg after emptying veins. Stand or walking check filling of veins , it indicates incompetence of communicating veins

4). Pratt's test – Esmarch elastic bandage is applied from toes to the groin. A tourniquet applied at groin at the upper end of the elastic bandage. This causes emptying of varicose veins. The tourniquet is kept in position and the elastic bandage is taken off. The same elastic bandage applied from the groin downwards. At the position of posterior of the perforator, a blow out or a varix can be seen.

5). Perthes test – for deep veins are normal or not

A tourniquet is tied around the upper part of thigh tight enough to prevent any reflux down the vein. Patient is asked to walk quickly with the tourniquet in place. If communicating and deep veins are normal the v.v. will shrink whereas if they are blocked the v.v. will more distended.

6). Schwartz's test -

# Investigations -

- ▶ 1). Venography
- ▶ 2). Doppler ultrasound
- ▶ 3). Photoplethysmography
- ▶ 4). Duplex ultrasound imaging



# Complications -

- ▶ Thrombophlebitis
- ▶ Pigmentation
- ▶ Eczema
- ▶ Ankle flare
- ▶ Venous ulcer
- ▶ Haemorrhage
- ▶ Periostitis
- ▶ Calcification
- ▶ Equinus deformity – patient walking on toes for relief of pain

# Treatment

- ▶ A). Palliative
  - ▶ B). Operative
  - ▶ C). Fegan's injection and compression
- 
- ▶ A). Palliative treatment –
    - ▶ Avoid standing
    - ▶ Crep bandaging
    - ▶ Raised legs during sitting and sleep
    - ▶ Bicycle riding – exercise

- ▶ Operatives –
  - ▶ 1). Ligation
  - ▶ 2). Ligation and stripping
  - ▶ 3). Phlebectomy
  
- ▶ Fegan's injection –
  - ▶ Sclerosant inj. Ethanolamine oleate 5%
  - ▶ Sodium tetradecyl sulphate 3%(thrombovar)

# Ligation -

A). Sapheno-femoral incompetence –

- GA

- Oblique incision is made just below the groin crease starting from the femoral artery pulsation to 5cm medially.
- All tributaries of the long saphenous vein are ligated and divided.
- Long saphenous vein is now ligated flush with the femoral vein.
- Particular care is taken to see that there is no intervening tributary of the long saphenous vein between the ligature and the sapheno-femoral junction.
- Long saphenous vein is now ligated distal to the flush ligature and it is divided between the ligatures.

B). In case of saphenopopliteal incompetence – a ligature is applied at the short saphenous vein flush with the popliteal vein and another ligature distal to it. The short saphenous vein is divided between the ligatures.

# Ligation with stripping -

- ▶ Stripping operation mainly performed in long saphenous vein.
- ▶ Incompetent perforating veins are hardly found in association with short saphenous vein and since stripping the short saphenous vein can not only cause long standing oedema but may also permanently damage the sural nerve , short saphenous stripping is not practiced.

# - VENOUS ULCER -

- ▶ Varicose ulcer is a painful, bloody lesion that appears on the skin when underlying veins are unable to pump blood efficiently.
- ▶ Venous ulceration has two main aetiologies.
- ▶ 1). Ulceration may be associated with demonstrable varicose veins
- ▶ 2). Ulceration may be follow thrombosis and phlebitis in the deep and perforating veins. This group will be history of long standing oedema of the leg.

# Pathogenesis-

- ▶ After deep vein thrombosis, if the deep venous system is allowed to eventually recanalize itself, the delicate valves will remain impregnated laterally in organized thrombosis.
- ▶ Gravitational pressure increases – edema to ankle region
- ▶ Initial Thrombosis or may become incompetent by dilatation resulting from the back pressure of the valveless deep venous ulcer develops.
- ▶ Within 10yrs of untreated thrombophlebitis, 50% will have venous ulcers.

# Special investigations -

- ▶ Ascending functional phlebography or venography is highly important to formulate treatment in difficult cases. It will show the size of lumen of the deep veins, the presence of valves and existence of high pressure leaks in the calf.
- ▶ Doppler apparatus may be adopted to indicate the direction of flow in veins.



# Treatment -

▶ A). Conservative treatment –

- elevation of the affected limb
- mobility of ankle and foot
- active movement of the calf muscle
- a firm elastic 'blue line' bandage is applied spirally from the base of the toes upto the knee joint.
- antibiotic given after c & s
- dressing regular

B). surgical treatment –

- subfascial Ligation of cockett and Dodd
- by-pass operation
- valvular repair.



SPIDER VEINS

RETICULAR  
VARICOSE VEINS

VARICOSE  
VEINS TRUNK

CHRONIC VENOUS  
INSUFFICIENCY

TROPHIC  
ULCERS

## STAGES OF DEVELOPMENT OF VARICOSE



## Stages of development for venous leg ulcers



*Skin redness and inflammation of the subcutaneous tissue in the area of the lower leg*



*Through inflamed skin starts to leak fluid*



*Then appears whitish small areas of dead skin*



*Then formed wound surface venous ulcers*

	VENOUS	ARTERIAL	NEUROPATHIC
<b>Example</b>			
<b>Pain</b>	Painful	Painful	Not painful
<b>Site</b>	Medial malleolus region	Toes, pressure points	Pressure areas (sole, heel and bony prominences)
<b>Base</b>	Red base with some granulation, exudative	Cyanotic, pale, no granulation and with necrotic tissue	Red, with necrotic or doughy tissue
<b>Ulcer edges</b>	Can be irregular or irregular, slope edges with sign of slow healing	Irregular margin, punched out with no sign of healing	Punched out
<b>Depth</b>	Shallow	Deep	Deep
<b>Surrounding tissue</b>	Oedematous, indurated, dilated veins, venous skin changes, and warm	Dry, cold and shiny skin, collapsed veins, prolonged capillary refill time and absent pulses	Foot deformities, warm and dry, shiny skin, and decreased sensation

### Venous leg ulcer

- Common in elderly
- Result of chronic venous hypertension
- Persistent inflammation
- Hemosiderin deposits
- Lipodermatosclerosis



### Arterial ulcer

- Reduced blood supply
- Ischemia, necrosis
- Little exudate
- Atrophic skin
- Common in diabetes
- Pain

### Diabetic foot ulcer

- Common in diabetes
- Hyperglycemia
- Micro-/macroangiopathy
- Neuropathy
- Infection
- Foot deformities



### Pressure sore

- Area of tissue necrosis
- Caused by prolonged soft tissue compression
- Local ischemia, moisture
- Multi-morbid and elderly

### Hypertrophic scar

- Rapid growth
- Generally regress <6 months
- $\alpha$ SMA<sup>+</sup> myofibroblasts
- Collagen fibers parallel to skin surface
- Vertically oriented blood vessels



### Keloid

- Constant growth
- No spontaneous regression
- Extend beyond margins of tissue damage
- Genetic predisposition
- Thick, haphazardly oriented collagen bundles

# Surgical links-

- ▶ <https://www.youtube.com/watch?v=VVjHFapkX2w>
- ▶ <https://www.youtube.com/watch?v=uRe-IQDVV-k>
- ▶ <https://www.youtube.com/watch?v=XN7Z9ibBagY>