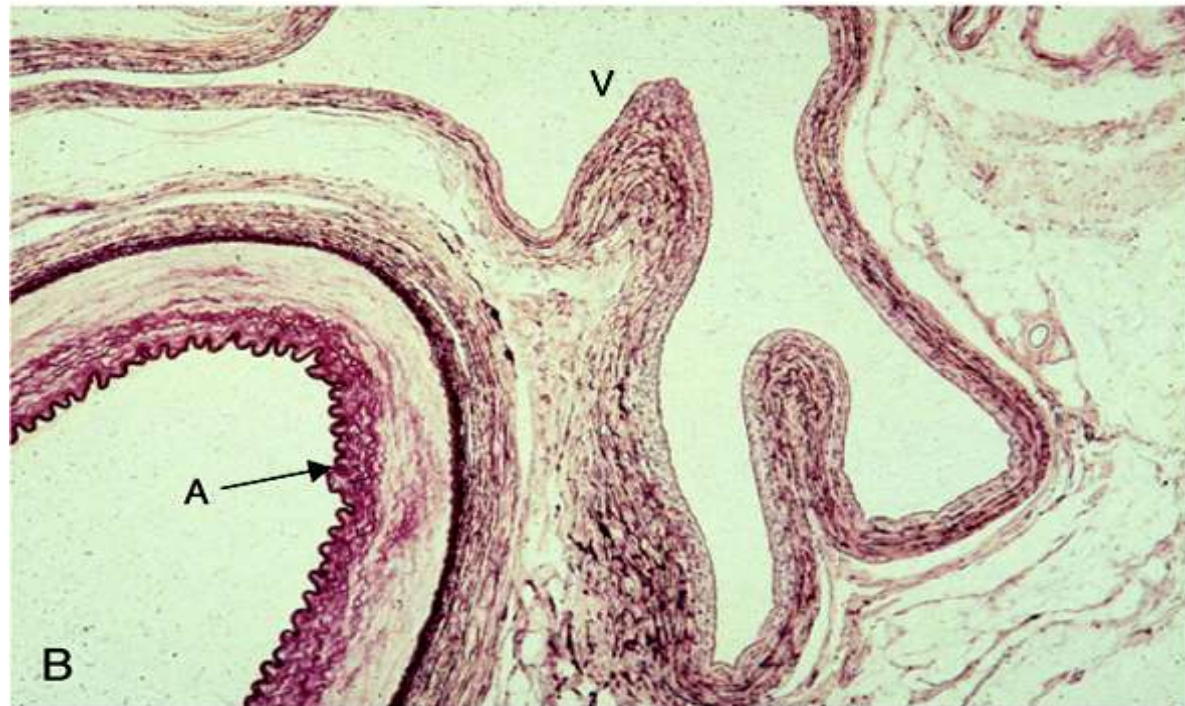
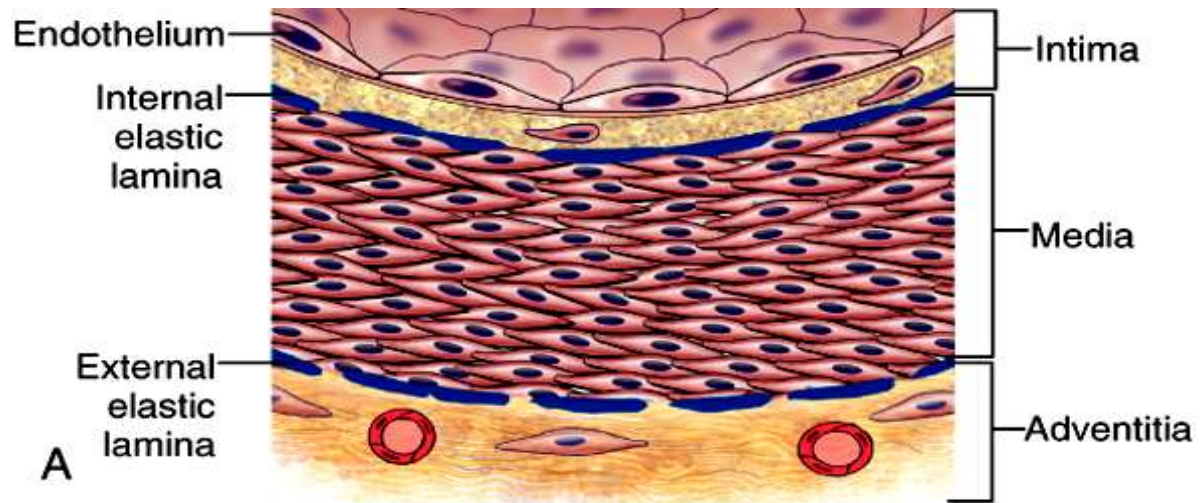
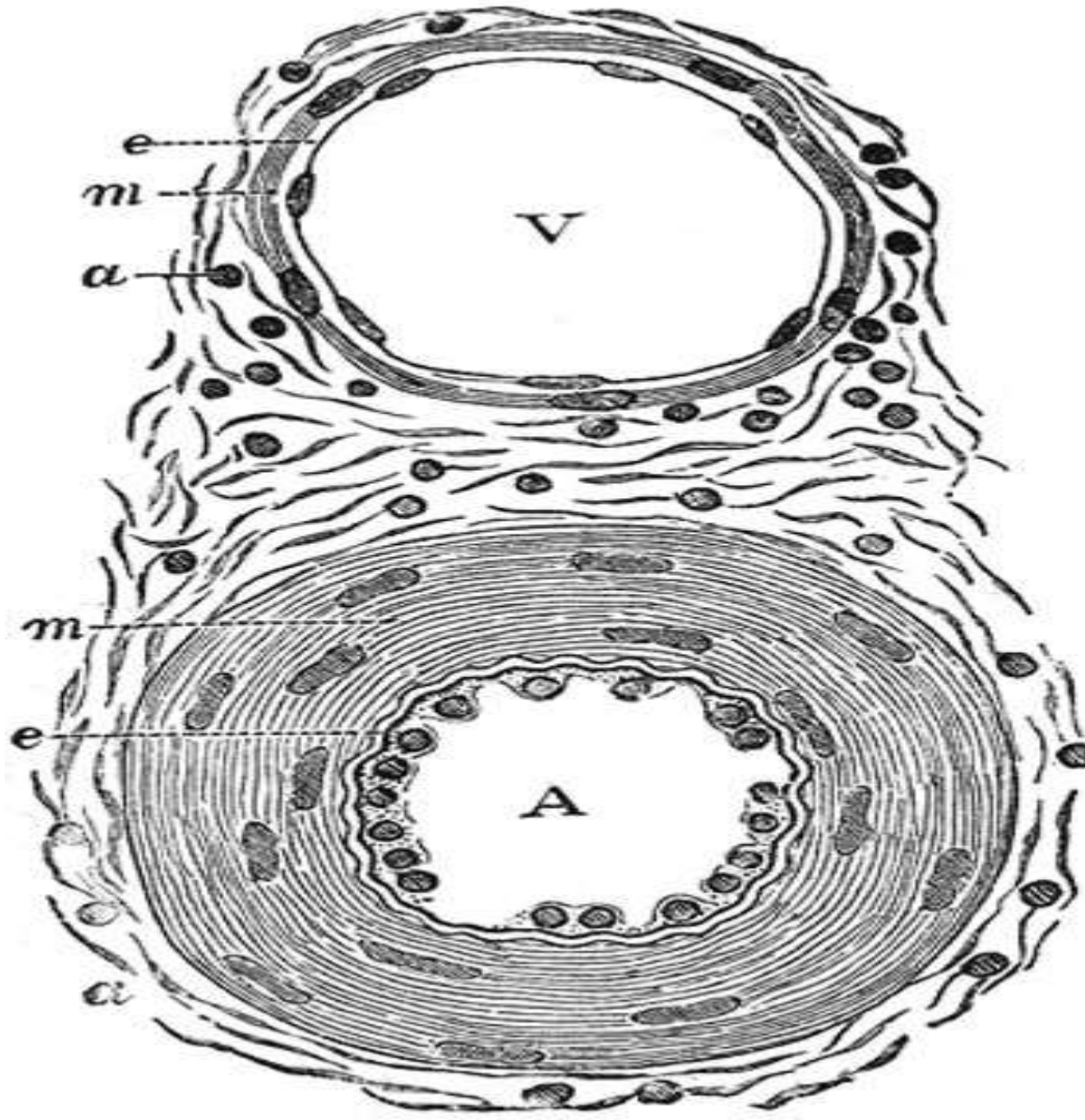


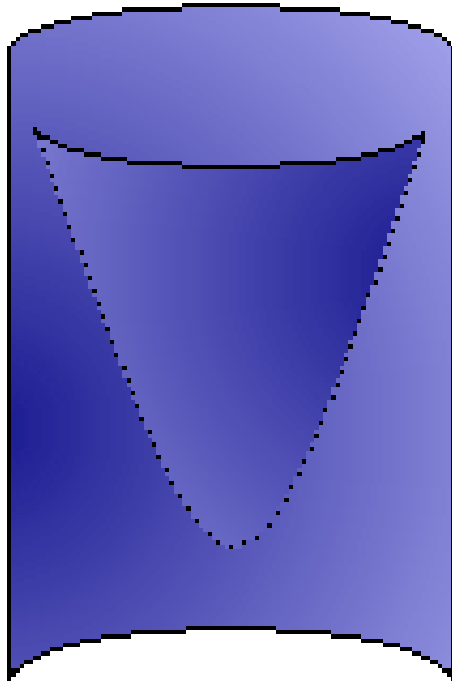
# **Veins and Lymphatics**



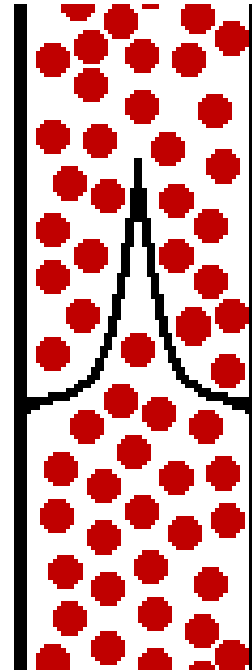
# ARTERY (A) VERSUS VEIN (V)



# Normal vein physiology



pocket valve



# PATHOLOGY OF VEINS

## ○ *Varicose Veins*

- abnormally dilated, tortuous veins produced by prolonged increase in intra-luminal pressure and loss of vessel wall support.
- The *superficial veins* of the leg are most typically involved





# *VARICOSE VEINS*



After prolonged standing

Before



- Symptoms: venous stasis and edema (*simple orthostatic edema*)+ cosmetic effect
- 10% to 20% of adult males and > 30% of adult females develop lower extremity varicose veins



# RISK FACTORS

- Obesity
- Female gender
- Pregnancy
- *Familial tendency* (premature varicosities results from imperfect venous wall development)





## ○ Microscopic Morphology

- Vein wall thinning
- intimal fibrosis in adjacent segments
- spotty medial calcifications (phlebosclerosis)
- Focal intraluminal thrombosis
- venous valve deformities (rolling and shortening)



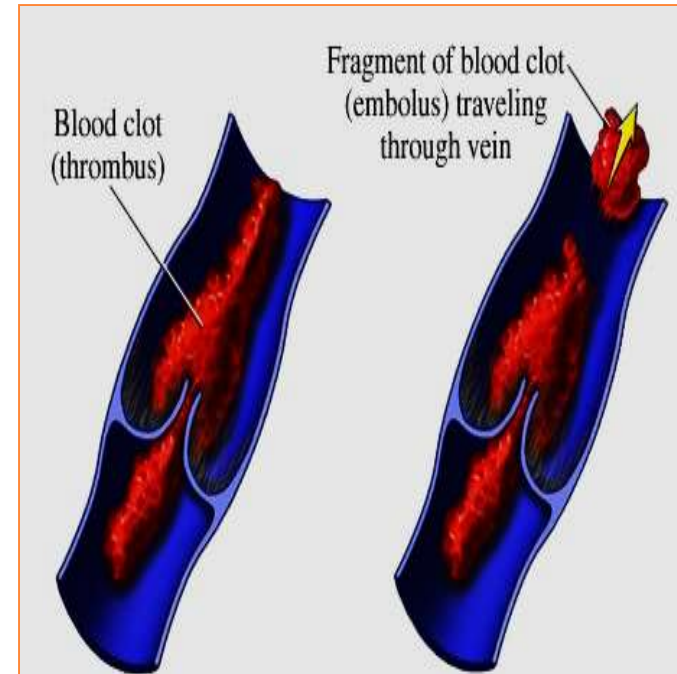
# COMPLICATIONS

- **stasis, congestion, edema, pain, and thrombosis**
- **chronic *varicose ulcers***
- ***embolism is very rare***

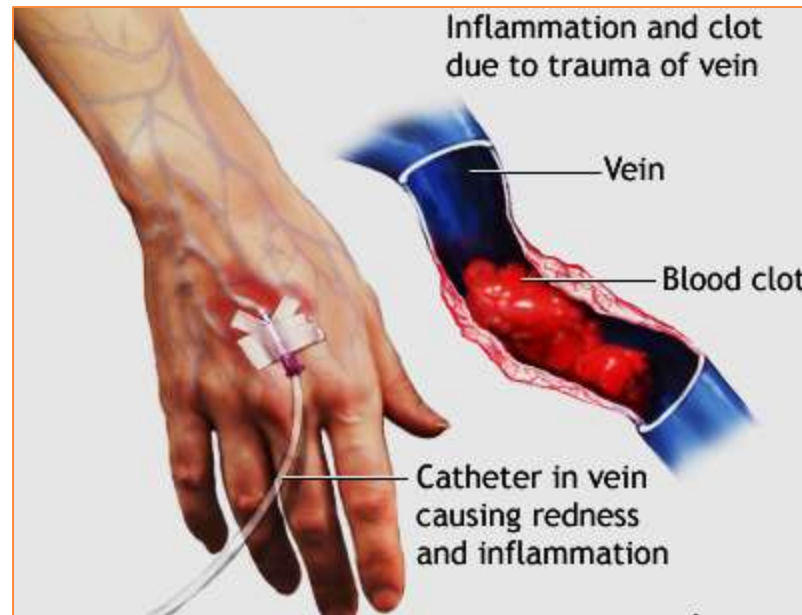


# THROMBOPHLEBITIS & PHLEBOTHROMBOSIS

- *interchangeable terms*
- = ***Inflammation + thrombosis of veins***
- *Most common site: deep leg veins (90% of all)*
- **predispositions:** congestive heart failure, neoplasia, pregnancy, obesity, the postoperative state, and prolonged bed rest or immobilization
- **local manifestations:** distal edema, cyanosis, superficial vein dilation, heat, tenderness, redness, swelling, and pain



- Thrombophlebitis of upper limb veins are usually associated with local risk factors like: catheter or canula site; or in some cases can be associated with systemic hypercoagulabilities.



---

---

○ **Special thrombophlebitis types:**

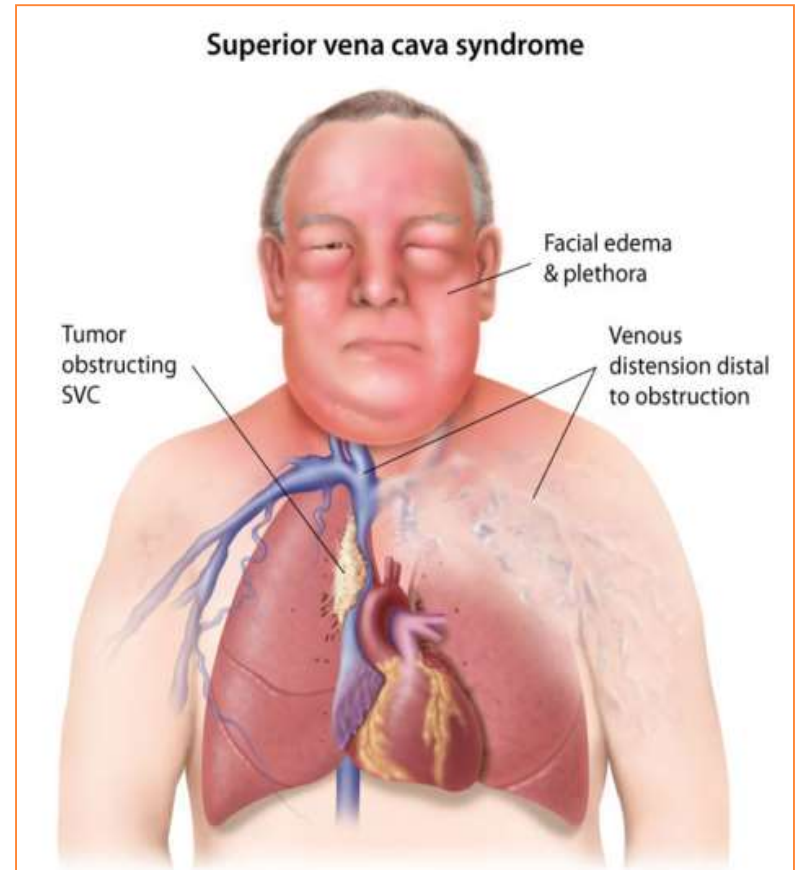
**1- Migratory thrombophlebitis (Trousseau sign):**

- hypercoagulability occurs as a **paraneoplastic** syndrome related to tumor elaboration of pro-coagulant factors (e.g. colon cancer; pancreatic ca; etc...)



## 2- THE SUPERIOR VENA CAVAL SYNDROME

- caused by neoplasms that compress or invade the superior vena cava
- Most common is lung cancer
- marked dilation of veins of head, neck, and arms with cyanosis



### 3- INFERIOR VENA CAVAL SYNDROME

- caused by neoplasms compressing or invading inferior vena cava (m/c: **hepatocellular carcinoma and renal cell carcinoma**) → striking tendency to grow within veins
- marked lower extremity edema, distention of the superficial collateral veins of the lower abdomen (medusa)





# **Pathology of Lymphatics**

**1- lymphedema**

**2- lymphangitis**

**3- chylous**

# Lymphedema



Blood Flow  
to the Heart  
& Lungs

Normal  
Leg



Swelling &  
Inflammation  
Below the  
Blockage site



# *LYMPHEDEMA*

○ can occur as:

**1- *Primary* (congenital) lymphedema** →

lymphatic agenesis or hypoplasia.

**2- *Secondary* (*obstructive*) lymphedema** →

blockage of a previously normal lymphatic  
examples:

- Malignant tumors
- Surgical procedures removing lymph nodes
- Post-irradiation
- Fibrosis
- Filariasis
- Postinflammatory thrombosis and scarring



# Lymphedema



# LYMPHANGITIS

- acute **inflammation** due to bacterial infections spreading into lymphatics
- m/c are **group A  $\beta$ -hemolytic streptococci**.
- lymphatics are **dilated** and filled with an **exudate** of neutrophils and monocytes.
- **red, painful subcutaneous streaks** (inflamed lymphatics), with painful enlargement of the draining lymph nodes (*acute lymphadenitis*).
- Sometimes, subsequent passage into the venous circulation can result in bacteremia or sepsis.



# CHYLOUS

- Milky accumulations of lymph in various body cavities
- caused by rupture of dilated lymphatics, typically obstructed secondary to an infiltrating tumor mass
- types
  - *chylous ascites* (abdomen)
  - *Chylothorax* (chest)
  - *Chylopericardium* (pericardium)

