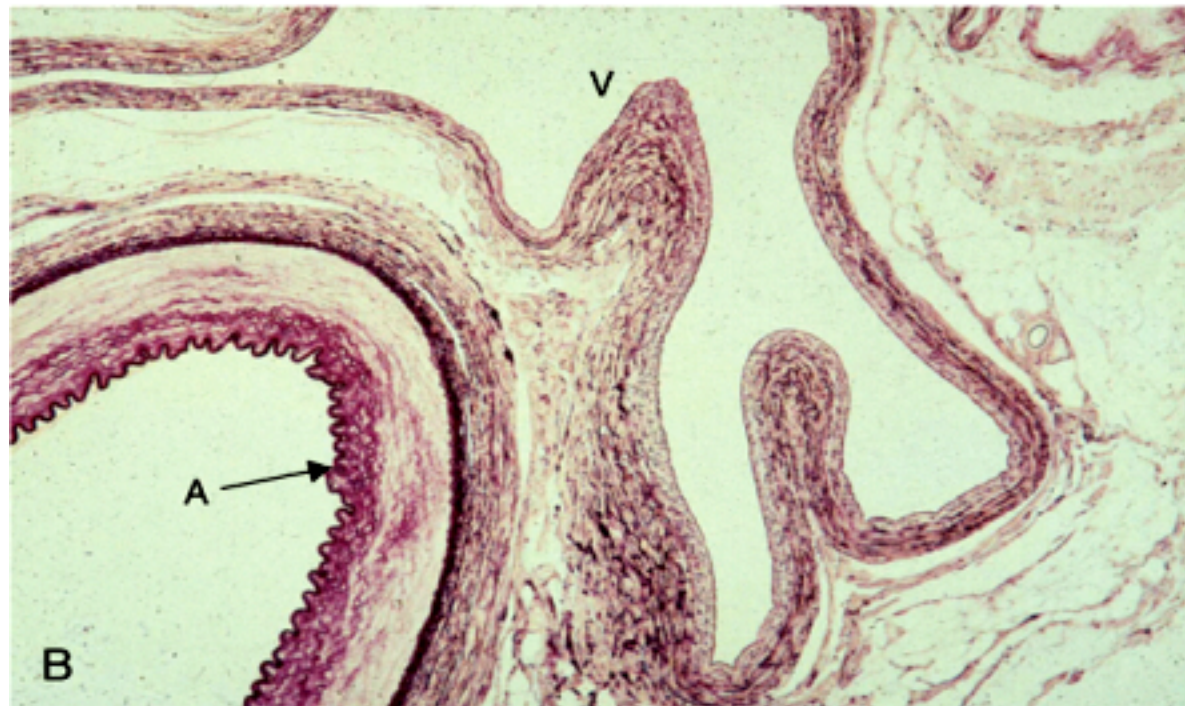
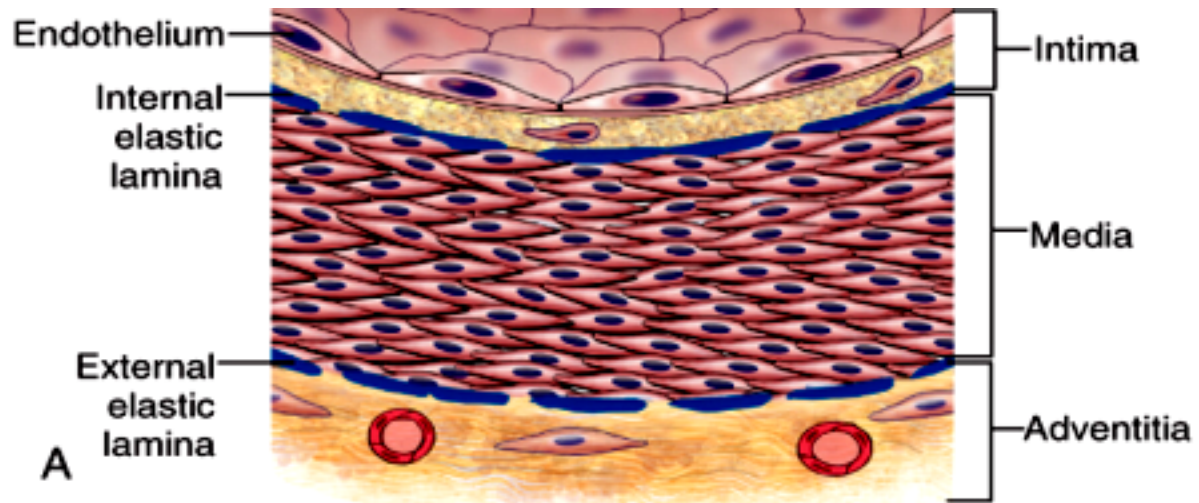
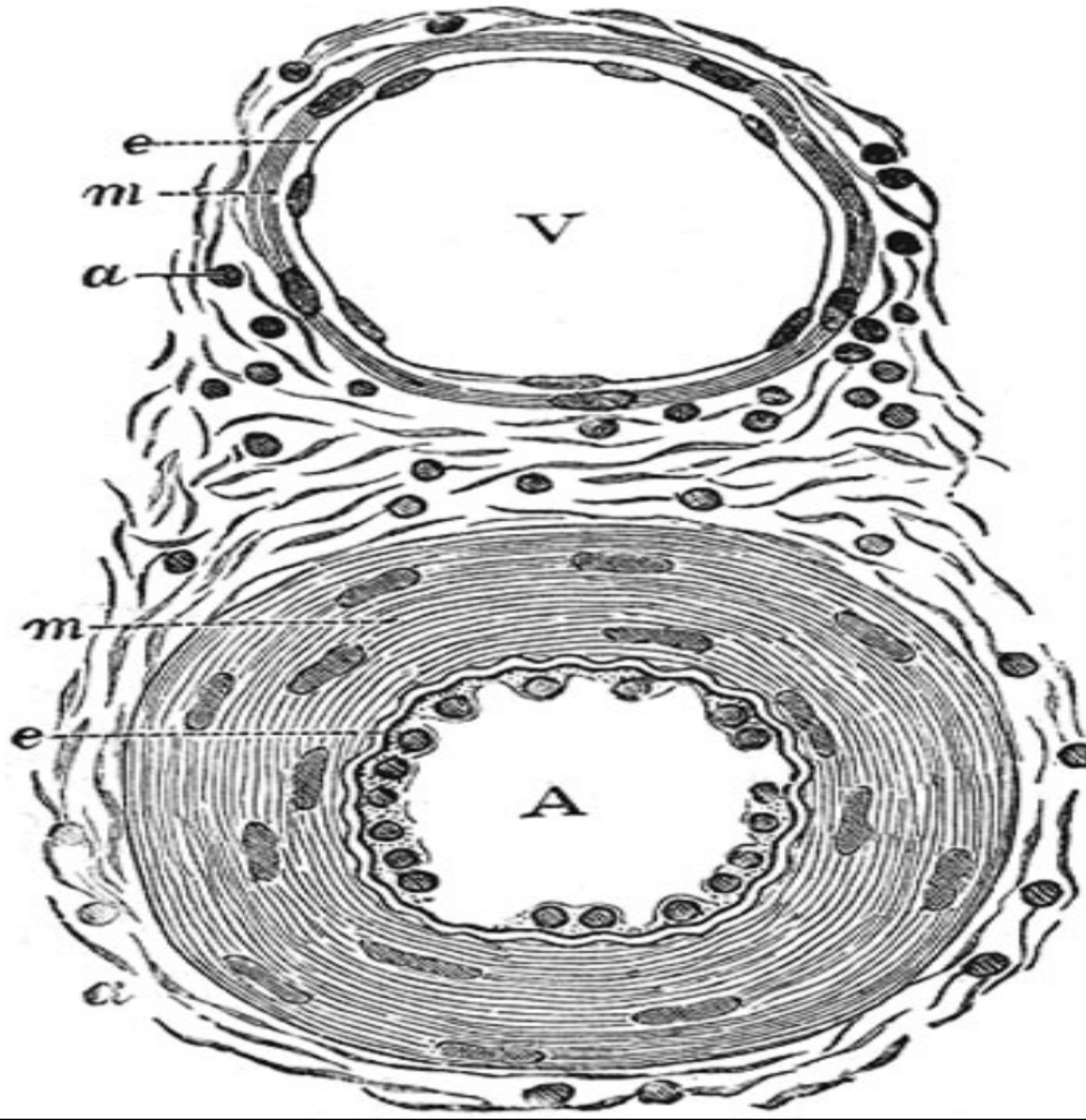


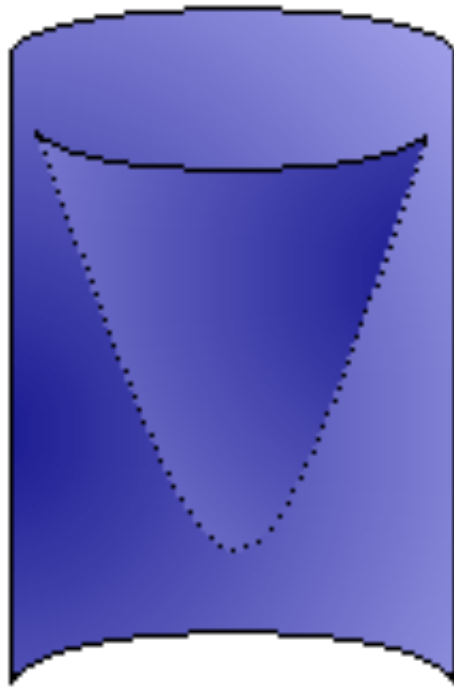
Veins and Lymphatics



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



- 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 AND PHLEBOTHROMBOSIS

- *interchangeable terms*
- = ***Inflammation + thrombosis of veins***
- *deep leg veins → 90% of cases*
- **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.



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○ *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)

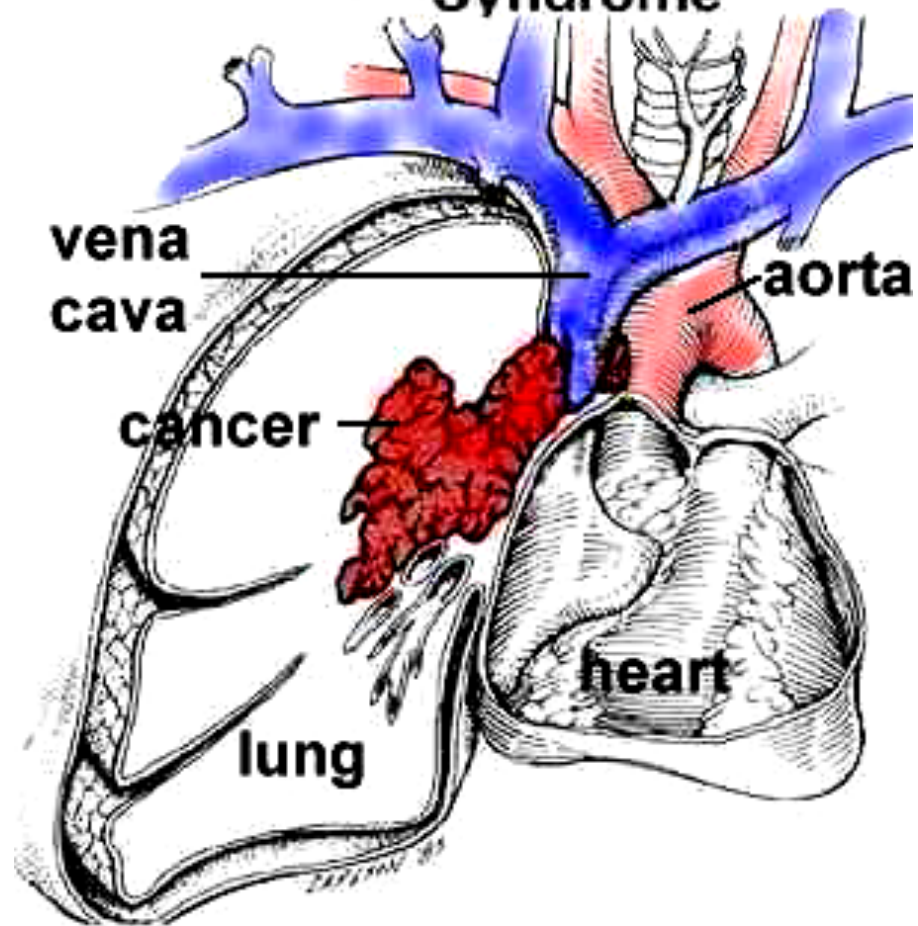


2- THE SUPERIOR VENA CAVAL SYNDROME

- 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.



Superior Vena Cava Syndrome



3- THE 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, and-with renal vein involvement-massive proteinuria.



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 β -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)

