PATHOLOGY

بسم الله الرحمن الرحيم

FINAL | Lecture 3

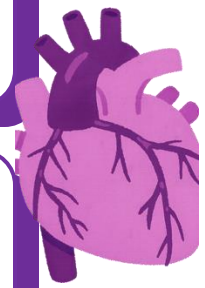
Pathology of Veins & Lymphatics

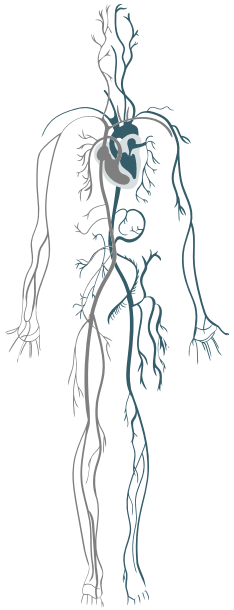
وَلَقَدْ خَلَقْنَا الْإِنسَانَ وَنَعْلَمُ مَا تُوَسْوِسُ بِهِ نَفْسُهُ ۖ وَنَحْنُ أَقْرَبُ إِلَيْهِ مِنْ حَبْلِ الْوَرِيدِ

اللهم إنّا نعوذ بك من شرور أنفسنا ومن سيئات أعمالنا

Written by: Salah Budair

Reviewed by: Laith Joudeh





وَلِلَّهِ الْأَسْمَاءُ الْحُسْنَى فَادْعُوهُ بِهَا

المعنى: يدل الاسمان على الرحمة الشاملة لجميع الخلائق بإيجادهم وإمدادهم، وعلى الرحمة الخاصة بالمؤمنين في الدنيا والآخرة.

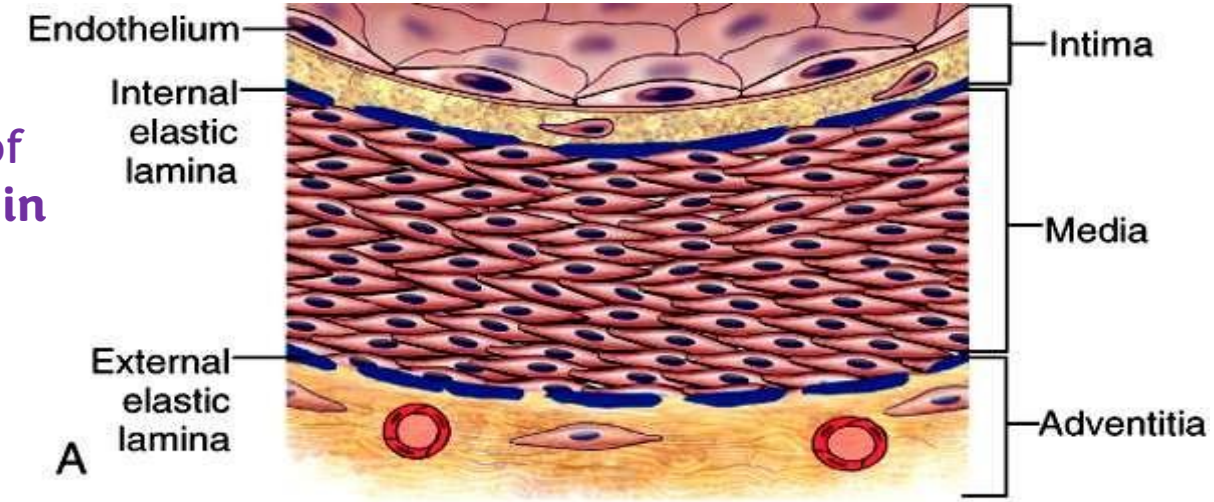
الورود: ورد اسم الرحمن (٥٧) مرة، أما اسم الرحيم فورد (١٢٣) مرة.

الشاهد: ﴿ٱلرَّحۡمَٰنُ ۝١ عَلَّمَ ٱلۡقُرۡءَانَ﴾ [الرحمن:١-٢]، ﴿إِنَّ ٱللَّهَ غَفُورٞ رَّحِيمٞ﴾ [المزمل:٢٠]

١١

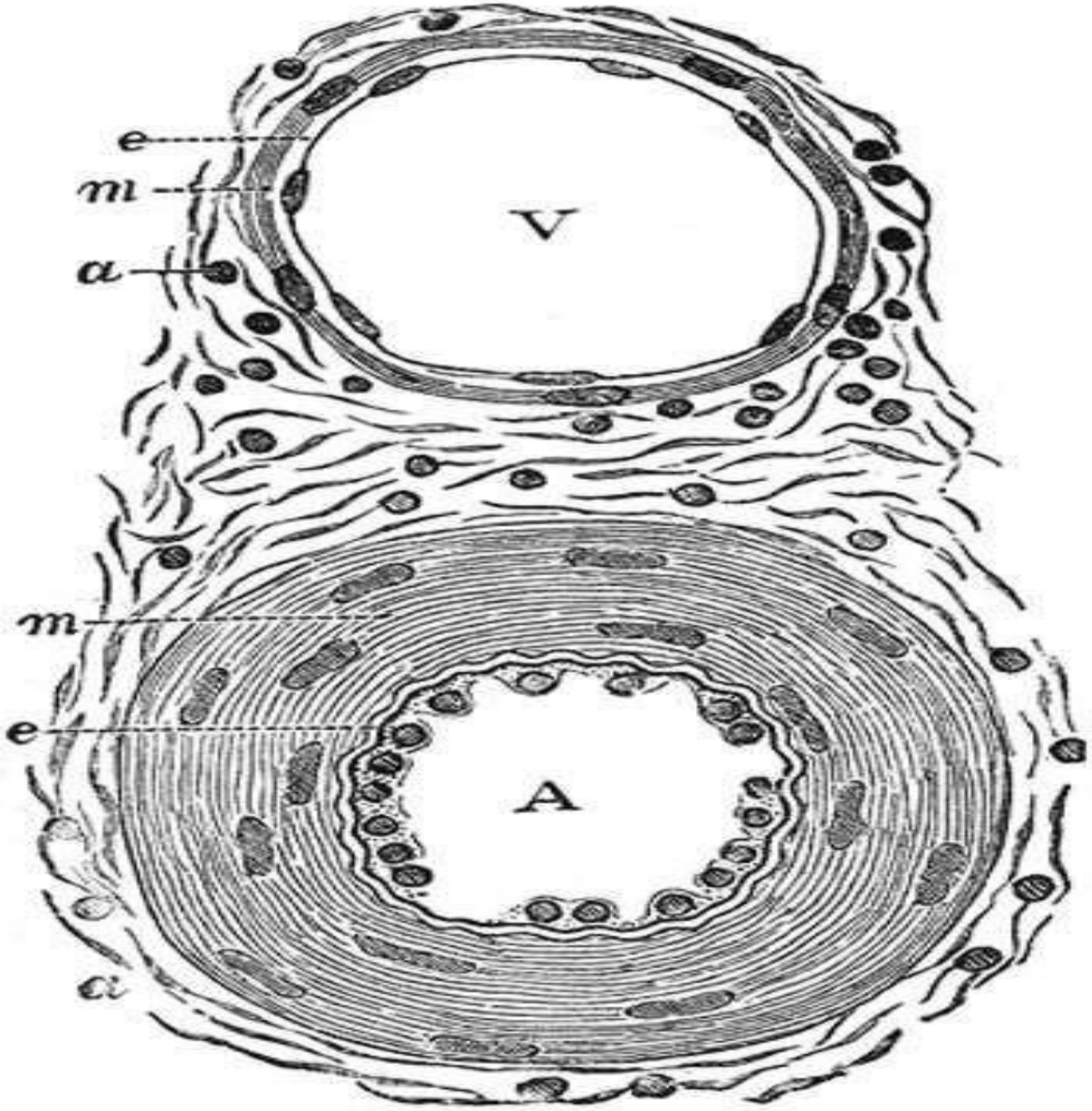
اضغط هنا لشرحٍ أكثر تفصيلًا

Media: composed **mainly** of smooth muscle fibers, and **in some blood vessels (particularly elastic arteries), contains elastic fibers**.

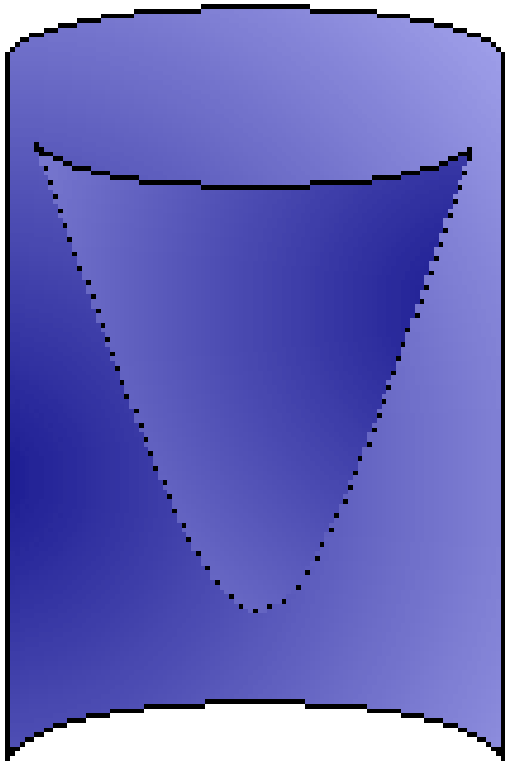


Arteries have a **thicker wall**, are **more rounded and rigid**, while veins have a **thinner wall**, a **less-developed tunica media**, and **commonly appear collapsed**.

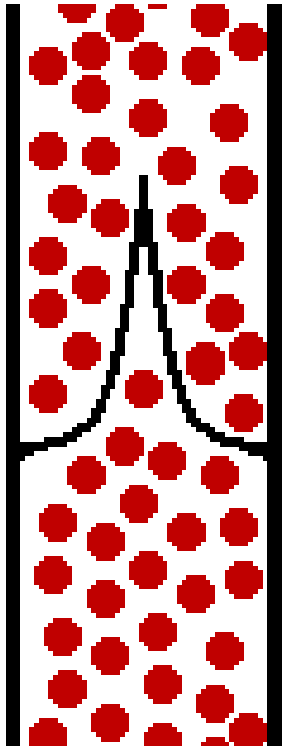
ARTERY (A) VERSUS VEIN (V)



Normal vein physiology



pocket valve



Prevents blood from flowing backward, and **they are aided by surrounding muscles** to help push blood and **maintain their physiological function.**

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

VARICOSE VEINS

After prolonged standing

Before

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

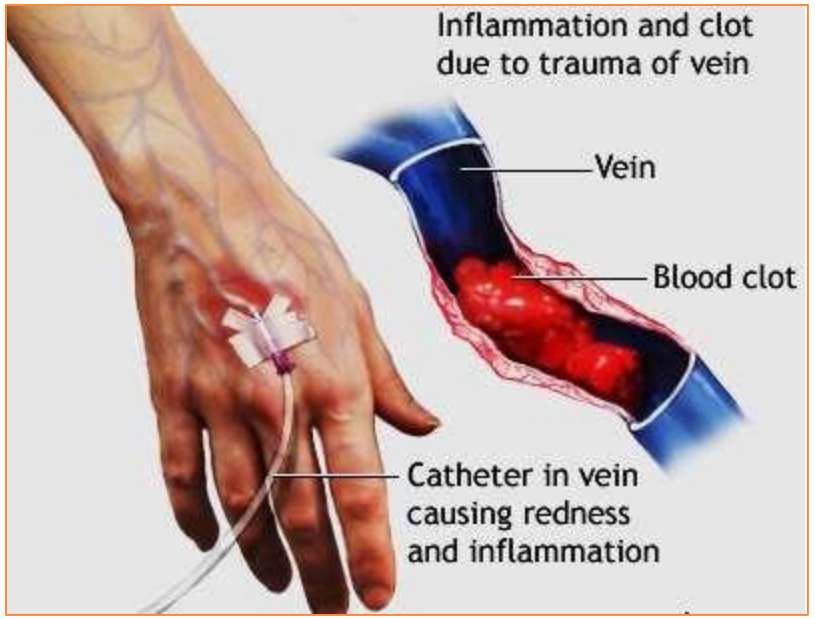
- Stasis, congestion, edema, pain, and thrombosis
- Chronic varicose ulcers (developing skin ulcers overlying the site of varicosities in long term patient)
- Embolism is **very rare**

Thrombophlebitis & Phlebothrombosis

- Interchangeable terms
- Definition: 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

Phlebo → Vein

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 hyper-coagulabilities.



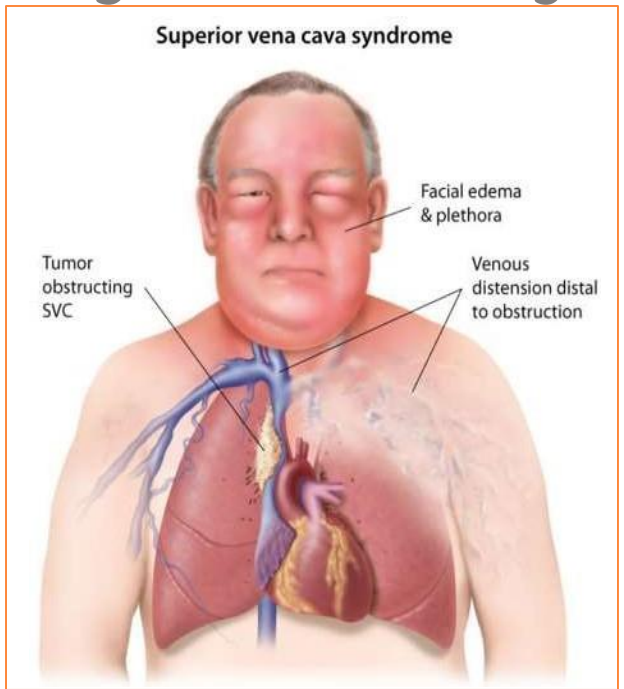
Special Thrombophlebitis Types:

1. Migratory thrombophlebitis (Trousseau sign):

- Hypercoagulability occurs as a **paraneoplastic** syndrome related to tumor elaboration of pro- coagulant factors (e.g. colon cancer, pancreatic cancer, etc.)
- One paraneoplastic syndrome is the **release of procoagulant factors into the circulation**, which leads to **migratory thrombophlebitis**. The patient **develops multiple sites of thrombophlebitis**, such as in the **extremities, abdomen, and internal organs**. These episodes of migratory thrombophlebitis show a **recurrent pattern** with **time intervals** between occurrences.

2. The Superior Vena Cava 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
- **Key Sign: Pemberton's Sign** (facial congestion/distress upon arm elevation).

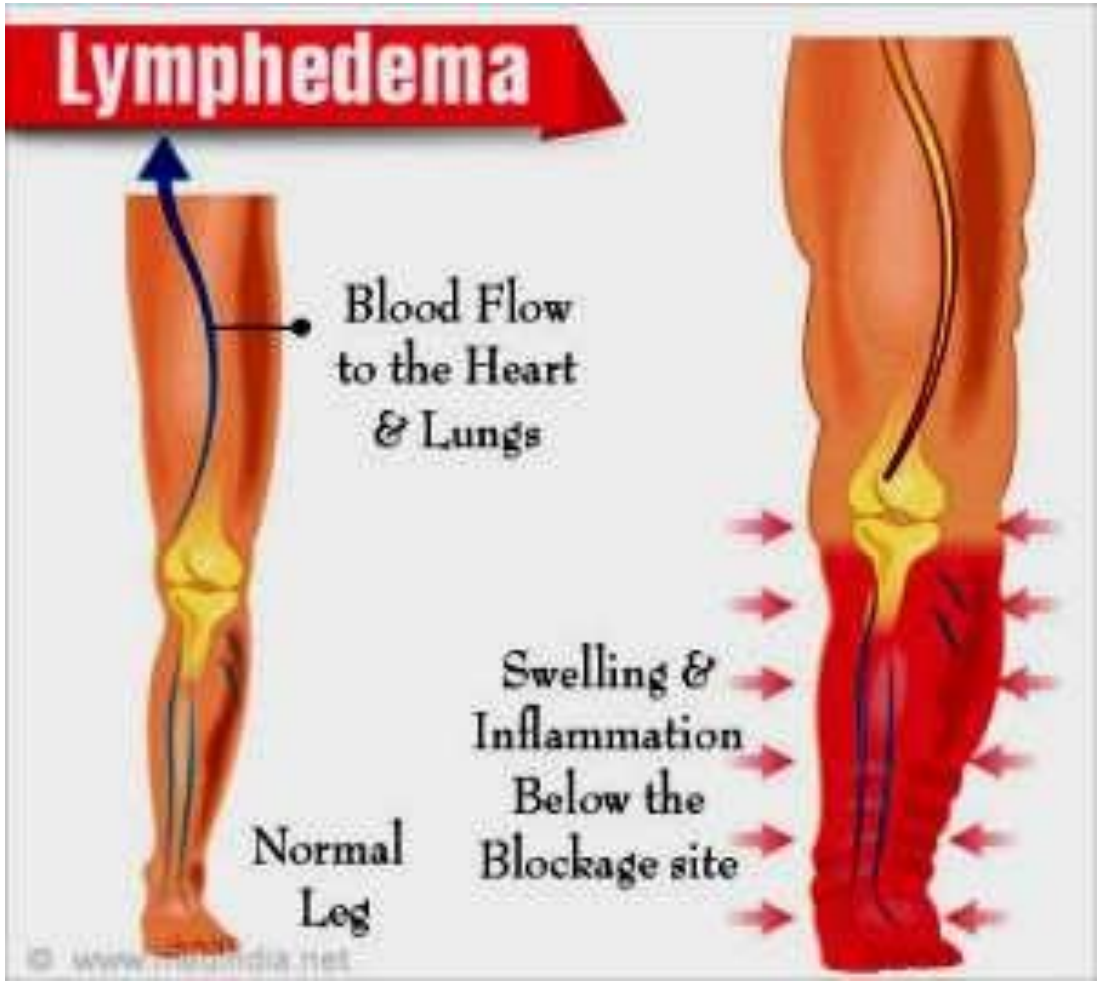


3. Inferior Vena Cava Syndrome

- 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**



The **lymphatic system returns excess interstitial fluid** from the tissues to the **venous circulation**, which then carries it back to the heart. If **one of the lymphatic vessels becomes obstructed**, interstitial fluid **accumulates in the tissue**, causing **swelling and inflammation** below the blockage and leading to the development of **lymphedema**.

Lymphedema

- Can occur as:

1. **Primary (congenital) lymphedema** → lymphatic agenesis or hypoplasia.
2. **Secondary (obstructive) lymphedema** (more common) → blockage of a previously normal lymphatic examples:
   - Malignant tumors
   - Surgical procedures removing lymph nodes e.g. mastectomy with the removal of ipsilateral lymph nodes
   - Post-irradiation
   - Fibrosis
   - Filariasis: a **parasitic infection** that causes **inflammation, destruction, and occlusion** of the **lymphatic vessels**.
   - Post-inflammatory thrombosis and scarring


Lymphedema

Lymphangitis

- Definition: 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

- Definition: 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)*

PATHOLOGY QUIZ

LECTURE 3

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Corrections from previous versions:

Versions	Slide # and Place of Error	Before Correction	After Correction
V0 → V1	Slide #15	Missing picture	Added the missing picture
V1 → V2			