Testing Considerations, Patient History, Mechanisms of Disease, and Physical Examination

CHAPTER 26

Testing Considerations

- Pertinent clinical history and relevant physical examination findings are key
  - Swelling, redness, warmth of an extremity
  - Lab values such as prothrombin time (PT), partial thromboplastin time (PTT), d-dimer
  - Identification of risk factors

Environment

- Room temperature will affect your exam!
  - Keep the room warm to promote patient comfort and decrease vasoconstriction
- Use warm gel
- Keep patient covered with a sheet/blanket as much as possible

Patient History: Signs and Sx

- **Acute Deep Venous Thrombosis**:
  - Swelling
  - Pain
  - Erythema
  - Warmth
- Remember, acute means “sudden onset” – if the patient has been experiencing these sx for weeks or months, it is not an acute situation!!!

Testing Considerations

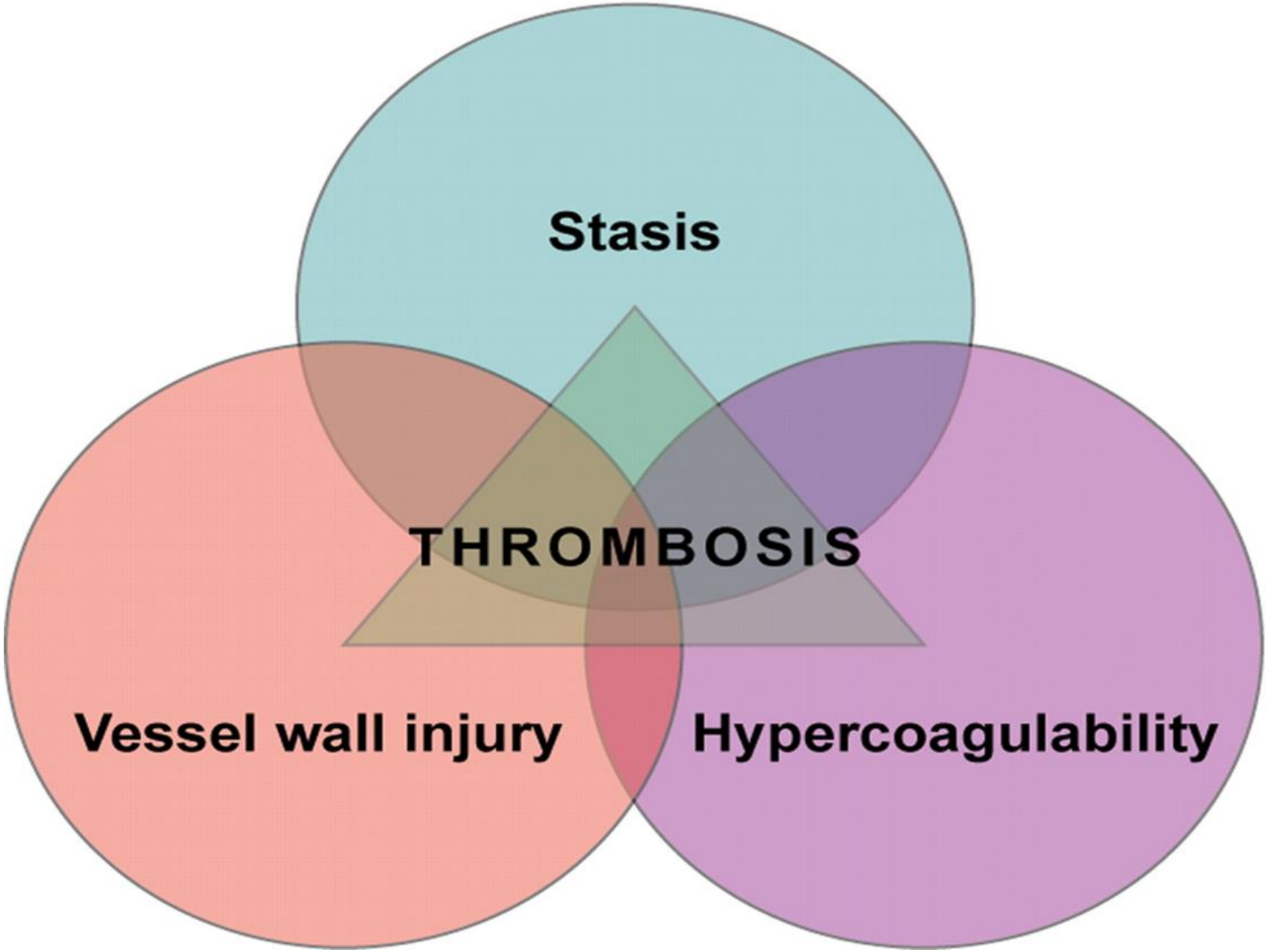
- **Chronic Venous Thrombosis**:
  - Swelling
  - Erythema
  - Heaviness/aching
  - Discoloration or ulcerations
  - Varicosities

Testing Considerations

- **Differential considerations of deep venous thrombosis:**
  - Muscle strain or tear
  - Injury to the leg
  - Baker's cyst
  - Cellulitis
  - Heart failure
  - Complications of chronic venous insufficiency

Risk factors

- Development of venous thrombosis is based on three groups of risk factors: ***Virchow's Triad***
    1. Trauma
    2. Venous Stasis
    3. Hypercoagulability


Stasis
THROMBOSIS
Vessel wall injury
Hypercoagulability

Virchow's Triad

- Trauma:
  - Intrinsic damage due to catheter or IV drugs
    - PICC lines have a high incidence of upper extremity thrombus
  - Extrinsic trauma can occur as the result of an accident

Virchow's Triad

- Venous Stasis:
  - Bed rest or immobility (surgery associated or otherwise)
  - Myocardial infarction/Congestive heart failure
  - Hypotension
  - COPD
  - Obesity
  - Pregnancy
  - Previous DVT

Virchow's Triad

- Hypercoagulability:
  - Pregnancy
  - Cancer
  - Oral contraceptives or HRT
  - Genetic predisposition: factor V Leiden, protein C, protein S, or anti-thrombin III deficiency

Mechanisms of Disease

- **Thrombosis:**
  - Intraluminal thrombi is composed of RBC's trapped in a fibrin web
  - Found frequently at the cusps of venous valves or in the soleal sinuses

Mechanisms of Disease

- **Other causes of Thrombosis:**
  - Paget-Schroetter syndrome – intense, repetitive activity of the upper extremity
  - Common Iliac Vein Compression (May-Thurner syndrome) – anatomical placement of R CIA and L CIV causes stagnation
  - Nutcracker syndrome – compression of the LRV as it courses between the Aorta and SMA

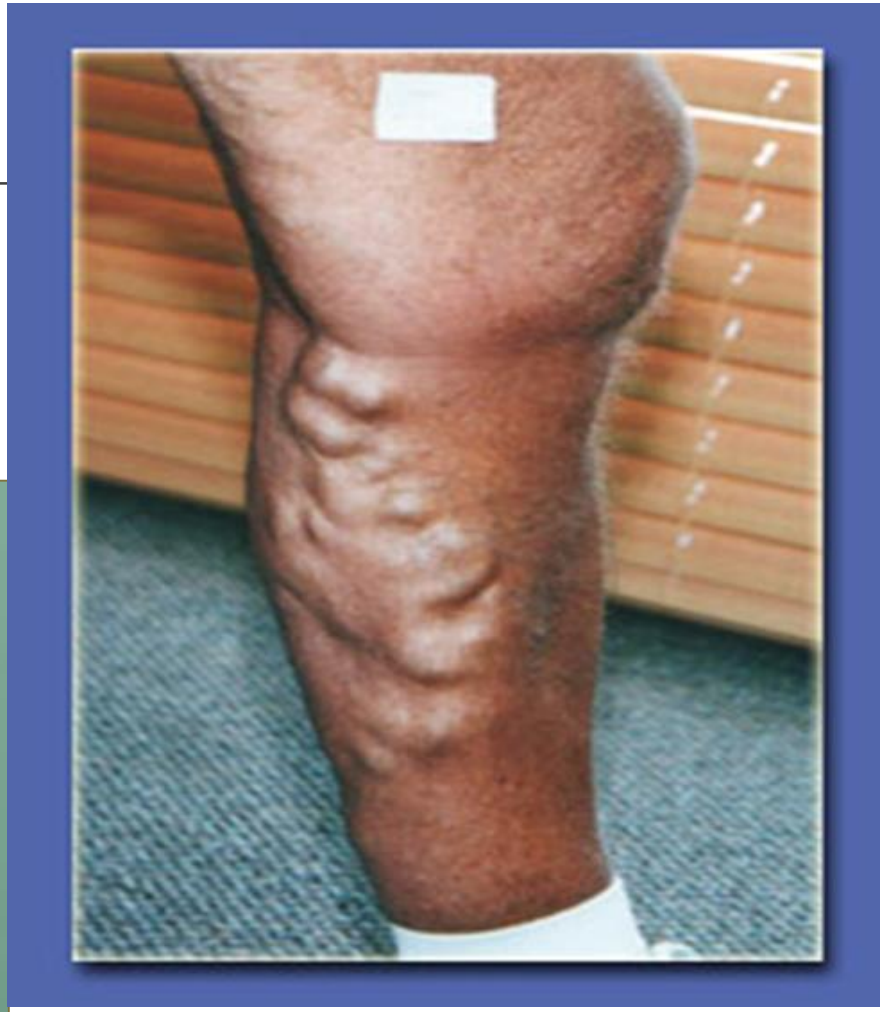
Mechanisms of Disease

- **Valvular Incompetence:**
  - Valves no longer maintain unidirectional venous flow
  - Incompetent valves allow blood to travel both antegrade and retrograde
    - Increases venous pressure, creating venous hypertension
    - May precipitate edema and varicosities

Mechanisms of Disease

- **Valvular Incompetence:**
  - Common findings in the *gaiter zone:*
    - Breakdown of RBC's will lead to brawny discoloration of the skin
    - Lack of oxygen and nutrients will lead to breakdown of tissue, causing ulcerations

Valvular Incompetence



Mechanisms of Disease

- **Congenital Venous Disease:**
  - Avalvular veins
  - Incompetent veins
  - Arteriovenous malformations
- **Portal Hypertension:**
  - Increased portal venous pressure caused by an obstruction, related to liver disease and causes hepatofugal flow

Mechanisms of Disease

- **Miscellaneous Conditions:**
  - Superior Vena Cava Syndrome – obstruction of the SVC
  - Renal Cell Carcinoma - most common renal mass in the adult and causes thrombosis of the renal vein
  - Venous aneurysm – localized dilatation of a vein, rare, may cause thrombosis and embolization

Physical Examination

- Varicose Veins:
  - Primary – dilated veins secondary to valvular incompetence of superficial system; deep system intact
  - Secondary – dilated veins caused by incompetence of the superficial system results from deep vein obstruction; deep system **not** intact

Physical Examination

- Ulcers (can result from arterial or venous problems):
  - Caused by lack of oxygen and nutrients
    - Venous ulcers found near medial and lateral mallelolus
    - Arterial ulcers found on toes, tibial area, bony prominences

Physical Examination

- Skin changes:
  - Brawny discoloration
  - Lipodermatosclerosis – thickening and hardening of the skin; seen in patients with chronic venous insufficiency
  - Phlegmasia alba dolens - pallor
  - Phlegmasia cerulean dolens - cyanosis

Physical Examination

- Edema:
  - Body tissue contains excessive fluid – common sign of elevated venous pressure
  - Pitting edema: accumulation of fluid in subcutaneous tissue, fluid can be displaced
  - Nonpitting edema: excessive accumulation; fluid cannot be displaced
    - Lymphedema: obstruction of the lymphatic system

Varicose veins

Venous ulcer

Arterial ulcer


Phlegmasia alba dolens


Phlegmasia cerulean dolens


Lipodermatosclerosis


Brawny discoloration


Pitting
Edema


Lymphedema