History and Physical Findings of Venous Disease

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Chronic Venous Disease

- Heterogeneous group of morphologic and functional abnormalities, ~50% of adult population\(^1\)
- Venous reflux & valve damage, muscle pump dysfunction, compression or thrombosis
- Simple “cosmetic blemishes”; can progress to limb-threatening ulceration and disabling edema
- May involve superficial, deep or both venous systems
Superficial Veins

- Great saphenous vein above knee
- Great saphenous vein below knee
- Small or Lesser saphenous vein
- Non-saphenous veins
- Telangiectasias or reticular veins

Deep Veins

- Inferior vena cava
- Common iliac vein
- Internal iliac vein
- External iliac vein
- Pelvic: gonadal, broad ligament veins, etc
- Common femoral vein
- Deep femoral vein
- Femoral vein (to avoid confusion with “superficial”)
- Popliteal vein
- Crural veins: AT, PT, peroneal (paired)
- Muscular veins: gastronemius, soleus, etc
Venous hypertension

• Final common pathway for chronic disease

• Anatomical, physiologic and histologic changes
  • Vein dilatation
  • Skin changes/pigmentation
  • Induration/fibrosis
  • Ulceration

• Factors responsible for progression to severe disease poorly understood

• Progression is often not sequential
Venous Hypertension - Chronic Venous Insufficiency

- Blood escapes from typical centrally-directed flow and refluxes backward or peripherally.
- May be due to damaged or congenitally absent valves.
- More commonly associated with superficial veins (saphenous, perforators) but may involve both systems.
Venous hypertension – Proposed mechanism

- Venous pressure overwhelms capillary flow
- Low-flow state traps white cells
- Proteolytic enzymes and free radicals damage capillary basement membrane
- Plasma proteins leak -> fibrin cuff
- Interstitial fibrin and edema decrease O2 delivery
- Hypoxia causes inflammation and tissue loss

http://www.mayoclinic.org/
Muscle Pump Dysfunction

• Calf muscles are motive force returning blood to the legs to the heart\(^5\)
• Vertical & horizontal blood flow
• Back-forth flow in perforators – deep/superficial pressure equalization
• Venous valves permit veins to distend and temporarily store blood in segments prior to muscle contraction
• Immobility or muscle atrophy prevent this
Venous Compression Syndromes

• Extrinsic compression 2/2 anatomic constrictions, malignancy, trauma, instrumentation, etc.\(^6\)

• Venous compression syndrome
  • May-Thurner

• Alternate sites of compression
  • Internal/external iliac bifurcation
  • Inguinal ligament
  • Popliteal venous entrapment

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3798333/figure/F5/
Venous Thromboembolism (VTE)

- 460,000 people in EU and 300,000 people in North America each year with deep vein thrombosis (DVT)
- Complications of VTE are associated with substantial national healthcare expenditure
  - ~$10 billion in US annually for associated costs
- DVT may result in irreversible valvular and endothelial damage, leading to post-thrombotic syndrome (PTS)
- ≥40% of patients within 2 years of first lower extremity DVT
Patient History – Risk Factors

- Advancing age
- Family history
- Ligamentous laxity (flat foot or pes planus)
- Prolonged standing (controversial)
- Obesity
- Sedentary lifestyle

- Smoking³ (poor wound healing, endothelial damage, smooth muscle proliferation, hypoxia)
- Prior lower extremity trauma
- Prior VTE
- AV shunting
- Pregnancy
Patient History – Signs and Symptoms

- Symptoms from superficial insufficiency (SVI) may be constant or episodic
- Often worst in early and late disease
- Deep venous insufficiency is almost always symptomatic and constant
- Typically worse in elderly
- Exacerbation: heat, length of time standing
- Alleviation: cold, elevation, compression
Patient History – Signs and Symptoms

- Pain
- Leg heaviness
- Leg achiness/throbbing
- Dry, tight skin
- Erythema/irritation
- Muscle cramps
- Pruritus
- Burning

Physical Examination

- Telangiectasias ("end vessel dilatation"), < 1 mm in diameter – spider veins
- Reticular veins
- Malleolar flare

https://www.uptodate.com/contents/image?imageKey=PC%2F62119&topicKey=SURG%2F8181&rank=1~150&source=see_link&search=chronic%20venous%20disease;https://static1.squarespace.com/static/536a4903e4b0bed465f55f2/t/53787250e4b02c5d0520b1a/1400350446559/
Physical Examination

- Varicose veins, $\geq 3$ mm
- Histologically demonstrate intimal hypertrophy, subendothelial fibrosis, and luminal dilation with wall thickening\(^7\)
- “Bag of worms”
- Follow superficial or perforators

https://www.uptodate.com/contents/image?imageKey=PC%2F62119&topicKey=SURG%2F8181&rank=1~150&source=see_link&search=chronic%20venous%20disease
Physical Examination

- **Edema**
  - Increased interstitial fluid
  - More commonly (though not invariably) involves the ankle and leg; less commonly extends to the foot/toes
  - Ddx: Hepatic insufficiency, renal failure, cardiac decompensation, infection, trauma, and environmental effects
Physical Examination

- Pigmentation, eczema
- Lipodermatosclerosis
  - Localized inflammation and fibrosis of the skin and subcutaneous tissues
  - Limits mobility 2/2 contractures
- Atrophie blanche
  - Localized, avascular depressed lesion surrounded by pigmentation and capillaries
  - Often confused for healed ulcer⁹
Physical Examination

• Stasis ulceration
  • Typically full-thickness, most common at ankles
  • Uncommon to spontaneously resolve
  • Aggressive wound care and venous intervention are likely to speed along recovery
CEAP Classification

- International consensus designed system to categorize chronic venous disease to aid in practitioner communication and patient management.

**Clinical**
- C₀: No clinical signs
- C₁: Small varicose veins
- C₂: Large varicose veins
- C₃: Edema
- C₄: Skin changes without ulceration
- C₅: Skin changes with healed ulceration
- C₆: Skin changes with active ulceration

**Etiology**
- E₈: Congenital
- E₉: Primary
- E₁₀: Secondary (usually due to prior DVT)

**Anatomy**
- A₀: Superficial veins
- A₁: Deep veins
- A₂: Perforating veins

**Pathophysiology**
- P₉: Reflux
- P₀: Obstruction

"Early application of compression should be performed to correct swelling and progressive scarring and to initiate the healing process by improving the venous microcirculation."

Ketterer R. Specific Steps to Effective Management of Venous Ulceration. Supplement to Wounds June 2010.

Venous Disease Severity Scoring

- Venous Clinical Severity Scale (VCSS)
- Venous Disability Score (VDS)
- Venous Segmental Disease Score (VSDS)
- Villalta scale
- Brings the disease back to the patient and clinician
  - Objective and subjective scales to guide response to management
Questions?

• Thank you
References


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