Goals and Objectives

• Identify and differentiate various forms of aneurysm
  – Etiology, pathogenesis/pathophysiology and consequences
• Recall the various vasculitides and their etiologies
• Recall the pathophysiology of Raynaud disease,
  – Association with specific diseases
  – Possible consequences
• Recall the definitions of varicose veins, phlebothrombosis, thrombophlebitis, vena caval syndromes, lymphangitis and lymphedema
Normal Anatomy

• Serosa
• Muscularis
• Intima
Normal Muscular Artery
Normal Vein
Aneurysms

- Atherosclerotic
- Syphilitic
- Connective tissue diseases
- Berry
Atherosclerosis

- Lipid deposition in media
- Disruption of elastic fibres
Atherosclerotic Aneurysms

- Infra-renal aorta
- Fusiform dilations of artery
Aorta Microscopic
Atheroma
Cholesterol Clefts
Aorta and Disruption
Atherosclerotic aorta
Atherosclerotic aneurysm
Atherosclerotic aneurysms

- Systemic disease
- Associated with smoking
- Dependent on size
- Consequences
  - Rupture
  - 90% mortality emergent
  - 1% mortality elective
Consequences

- Dissection
- Rupture
- Impingement on other vessels
  - Carotid arteries
  - Coronary arteries
  - Vertebral arteries
Dissecting AAA
Aortic Dissection
Dissection
False Lumen
AAA prognosis

- Under 5 cm watch and wait
- Over 5 cm observe
- Serial CT scans
- 5-10% rate of rupture/year
Syphilitic Aneurysms

• Destruction of vaso vasorum
• Arch of the aorta
  – Saccular aneurysm
  – 10-15 years after chancre formation
• Dr. Gutierriez
Syphilitic Aneurysm

Aneurysm of arch of aorta. The aneurysm eroded and absorbed part of the sternum, and the tumor on the skin was pulsatile and expansile. It burst externally subsequently. (McGill Pathological Museum.)
Syphilitic Aneurysm
Treponema pallidum
Marfan’s Syndrome

- Autosomal dominant disease
  - ~15% spontaneous mutation
- Chromosome 15
  - FPN1 gene
  - Fibrillin protein
  - Provides structural support for elastic tissue
- Patients weak elastic tissues
  - Joints, vessels, eyes
Marfan’s Signs and Symptoms

- **Skeletal system**
  - Tall
  - Long, slender limbs
  - Disproportionally long arms
  - Arachnodactyly

- **Ocular system**
  - Myopia
  - Astigmatism
  - Subluxation of lens

- **Cardiovascular system**
  - Heart Murmur
  - Floppy mitral valve
  - Mitral valve prolapse
  - Aortic aneurysm or dissection
  - Pregnancy
    - Complication

- **Pulmonary system**
  - Spontaneous pneumothorax
Marfan’s Dissection
Raynaud’s Phenomenon

• Series of digital colour changes
  – White to blue to red
  – White
    • Spasm
    • Diminished blood supply
  – Blue
    • Anoxia
  – Red
    • Reperfusion
• Young-middle aged women
• Other rheumatic diseases (2 Raynaud's)
• Cold, emotion, vibration
Raynaud’s Phenomenon

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Raynaud’s Phenomenon

White due to inadequate blood flow

Blue as oxygen is depleted in the tissues

Raynaud’s Phenomenon
Causes of Raynaud's

• Idiopathic
  – Sensitivity to cold
  – Over-responsive vessel diameter
Raynaud’s Associations

- Rheumatic diseases
  - Scleroderma
  - Rheumatoid arthritis
  - SLE
- Endocrinology
  - Hypothyroidism
- Trauma
  - Frostbite
- Drugs
  - Propranolol
  - Estrogens
  - Nicotine
  - Bleomycin
Intracranial Berry Aneurysms

- Saccular aneurysm Circle of Willis
- Weak spots present at birth
- Manifest in adulthood
Symptoms

• Presence
  – Double vision
  – Loss of vision
  – Headaches
  – Eye pain
  – Neck pain

• Rupture
  – Sudden occurrence of a severe headache (often described as "the worst headache of your life")
  – Headaches with nausea or vomiting
  – Stiff neck (occasionally)
  – Hemiplegia
  – Paresthesias
  – Numbness
  – Speech impairment
  – Look a lot like stroke symptoms
Circle of Willis
Berry Aneurysm
Ruptured Berry with CAH
Prognosis

• Depends on deficits
  – Coma is a bad sign
  – What’s been damaged

• Ruptured aneurysm
  – 25% die within one day
  – 25% die within 3 months
  – 25% will have permanent disability
Vascular Diseases

- Varicose veins,
- Phlebothrombosis,
- Thrombophlebitis,
- Vena caval syndromes,
- Lymphangitis
- Lymphedema
Varicose Veins

• Varicose veins are gnarled, enlarged veins.
  – "varix" Latin "twisted."
  – Increased pressure

• Common
  – 15% men
  – 25% women
  – 50% dentists
Causes

• Loss of elastic tissue
  – Ageing
  – Lack of exercise
• Pregnancy
• Standing
Thrombophlebitis

- Complication of varicose veins
- Complication of hypercoaguable state
- Stasis leading to clot formation
- Irritation due to inflammation
  - Superficial irritation
  - Deep vein life threatening
Thrombophlebitis

- Popleteal and pelvic veins
- Thrombosis
- Clot break off and migrate
  - Through venous circulation
  - To lungs (filter)
  - To systemic circulation
- Sudden death
  - Saddle embolus
Thrombophlebitis
Pulmonary Saddle Embolus
Phlebothrombosis

• Lemmierre’s syndrome
• Acute suppurative jugular thrombophlebitis
• Septic emboli
• *Fusobacterium necrophorum*
Vena Caval Syndrome

- Pressure on IVC
  - Gradual, insidious compression
  - Shortness of breath, cough, facial swelling
  - JVD

- Tumor
  - 2000’s 90% malignancy
  - 1950’s infectious
Lymphangitis

- Red streak up a limb
- Infection distal to the streak
- “blood poisoning”
Lymphedema

- Retention of lymph in a limb s/p lymph node dissection
- Swelling of arm of breast cancer patient after axillary dissection.
Lymphedema
Elephantiasis
Elephantiasis

- Lymphedema
- Filarial parasites blocking lymph vessels
- Treat the parasites
- Africa