ATHEROSCLEROSIS PATHOLOGY

Ortega RN MSN, CNS
Atherosclerosis Disease

- Atherosclerosis: Type of blood vessel disorder
  - Begins as soft deposits of fat that harden with age
  - Referred to as “hardening of arteries”
  - Involves progressive narrowing and degeneration of arteries of heart, carotid, abdomen, and extremities.

Atherosclerosis is the leading cause in majority of cases.
ATHEROSCLEROSIS

- Common Terms:
  - Arteriosclerotic heart disease
  - Cardiovascular heart disease
  - Coronary artery disease (CAD)
  - Peripheral vascular disease (PAD)
  - Carotid Disease
DESCRIPTION

- Typically appears at ages 60s to 80s
- Largely undiagnosed

Risk factors
- Cigarette smoking
- Hyperlipidemia
- Hypertension
- Diabetes mellitus
Etiology

- Characterized by a *focal deposit of cholesterol and lipid*, primarily *within the intimal wall* of the artery

- Endothelial *lining altered* as a result of *inflammation and injury*
Fig. 34-1. Pathogenesis of atherosclerosis. **A**, Damaged endothelium. **B**, Diagram of fatty streak and lipid core formation. **C**, Diagram of fibrous plaque. Raised plaques are visible: some are yellow, others are white. **D**, Diagram of complicated lesion: thrombus is red, collagen is blue. Plaque is complicated by red thrombus deposition.
PATHOPHYSIOLOGY

- C-reactive protein (CRP)
  - Non-specific marker of inflammation
  - Increased in many patients with CAD
  - Chronic exposure to CRP associated with unstable plaques and oxidation of LDL cholesterol
Pathophysiology

- Developmental stages: Fatty streaks
  - Earliest lesions
  - Characterized by lipid-filled smooth muscle cells
  - Potentially reversible
Pathophysiology

c. Developmental stages: *Fibrous plaque*

- Beginning of progressive changes in the arterial wall
- *Lipoproteins* transport cholesterol and other lipids into the arterial intima.
- Fatty streak is *covered by collagen*, forming a *fibrous plaque* that appears *grayish or whitish*.
- Result = *Narrowing* of vessel lumen
Pathophysiology

D. Developmental stages: *Complicated lesion*

- Continued *inflammation* can result in plaque instability, ulceration, and rupture.

- *Platelets accumulate* and *thrombus forms*.

- Increased *narrowing* or *total occlusion* of lumen.
COMMON SITES IN THE CORONARIES: CAD

- Affinity for coronaries
Fig. 38-1. Common anatomic locations of atherosclerotic lesions (shown in yellow) of the abdominal aorta and lower extremities.
Fig. 58-2. Common sites for the development of atherosclerosis in extracranial and intracranial arteries. The main locations are just above the common carotid bifurcation (most common site) and the start of the branches from the aorta, innominate, and subclavian arteries.
**Major Types of Stroke**

**Thrombotic stroke.** The process of clot formation (thrombosis) results in a narrowing of the lumen, which blocks the passage of the blood through the artery.

**Embolic stroke.** An embolus is a blood clot or other debris circulating in the blood. When it reaches an artery in the brain that is too narrow to pass through, it lodges there and blocks the flow of blood.

**Hemorrhagic stroke.** A burst blood vessel may allow blood to seep into and damage brain tissues until clotting shuts off the leak.

Fig. 58-3. Major types of stroke.
Ischemic Stroke

- Ischemic strokes result from
  - Inadequate blood flow to the brain from partial or complete occlusion of an artery
- 80% of all strokes are ischemic strokes.