

# Atherosclerosis

## Pathology Team

These are the companion notes  
for the HANDOUTS given by Dr. Sufia Hussain  
You can study from: Them + The Pathology Handouts

N.B. The”  “means it is an important MCQ

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In Cooperation with:

The Male's Pathology Team

## Atherosclerosis:

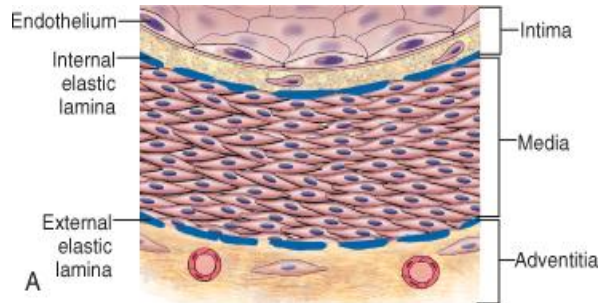
**Endothelium:** single cell-thick lining to all vessels

its structure and function helps in maintain those vessels' function and their wall's homeostasis.

## Smooth Muscle Cells:

Predominant cellular element of **vascular media**, they:

- Mediate Vasoconstriction and Dilation when there's a **stimuli**
- Synthesize collagen, elastic and proteoglycans (**extracellular matrix**) – elaborate growth factors and cytokines



When there's an injury to the vessel:

- smooth muscle cells are stimulated to grow
- vessels wall is reconstituting as a healing response . this includes:
  - formation of neo-intima** (a thickened layer of intima) as smooth muscle cells are:
    - migrating from media to intima
    - multiplying
    - synthesizing extracellular matrix
- smooth muscle cells lose the capacity to **contract**

**Atherosclerosis is one of Arteriosclerosis patterns**

**It is the most important one**

**Mönckberg medical calcific sclerosis** doesn't go over the vessel's lumen (doesn't affect the blood flow)

**What is the difference between Atheromas and Thrombosis?**

Atheromas a morphology of atherosclerosis

Thrombosis a complication that occurs **during** atherosclerosis



## Morphology:

**Fatty dot → line of fatty streak → grows bigger → partially block the passage (occlusion) but not 100% blockage**

**Intimal lesions:** in the intima

**Eccentric Lesions:** involve only a partial circumference of the arterial wall (weird lesions)



## Most heavily involved vessels:

- **Abdominal Aorta**
- **Coronary arteries** (cause ischemic heart disease)
- **Popliteal arteries** (may cause gangrene)
- **Internal carotid arteries** (cause stroke in the brain)
- **Vessels of the circle of willis** (circle of arteries that supplies the brain with blood)

 **Atherosclerotic Plaques** have three principal components:

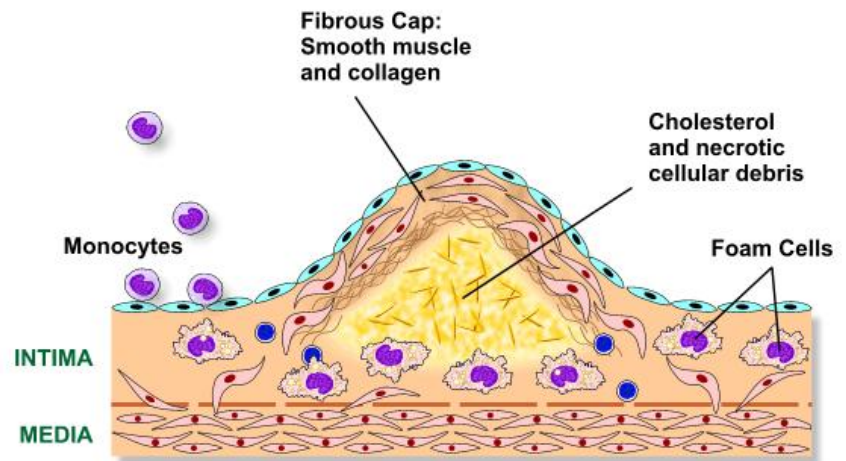
- 1- Cells
- 2- Extracellular matrix
- 3- Lipids

**Fibrous Cap:** superficial, at the top of muscle cells  
**Plaque in intima** is covered with **Endothelial cells**

**Neovascularization:**

formation of functional microvascular networks .  
 Formation/proliferating of small blood vessels

## Atheromatous Plaque



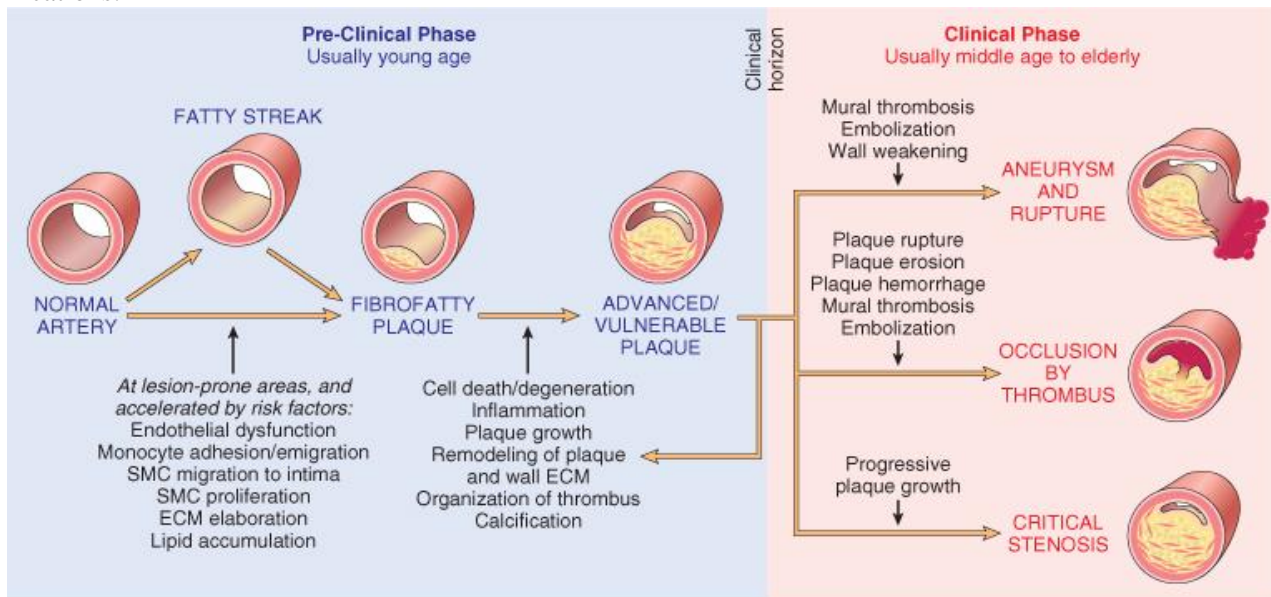
 **Complications of Atherosclerosis:**

**pathological changes occurring to this lesion:**

1. Rupture → formation of a **microemboli** (this is an injury → thrombogenic substances will develop thrombus)
2. Hemorrhage (rupture **of** the fibrous cap or **of** the thin-walled capillaries that vascularize the plaque)

**hematoma:** a collection of blood inside a blood vessel

3. Thrombosis.
4. Aneurysmal dilation.
5. Calcifications.



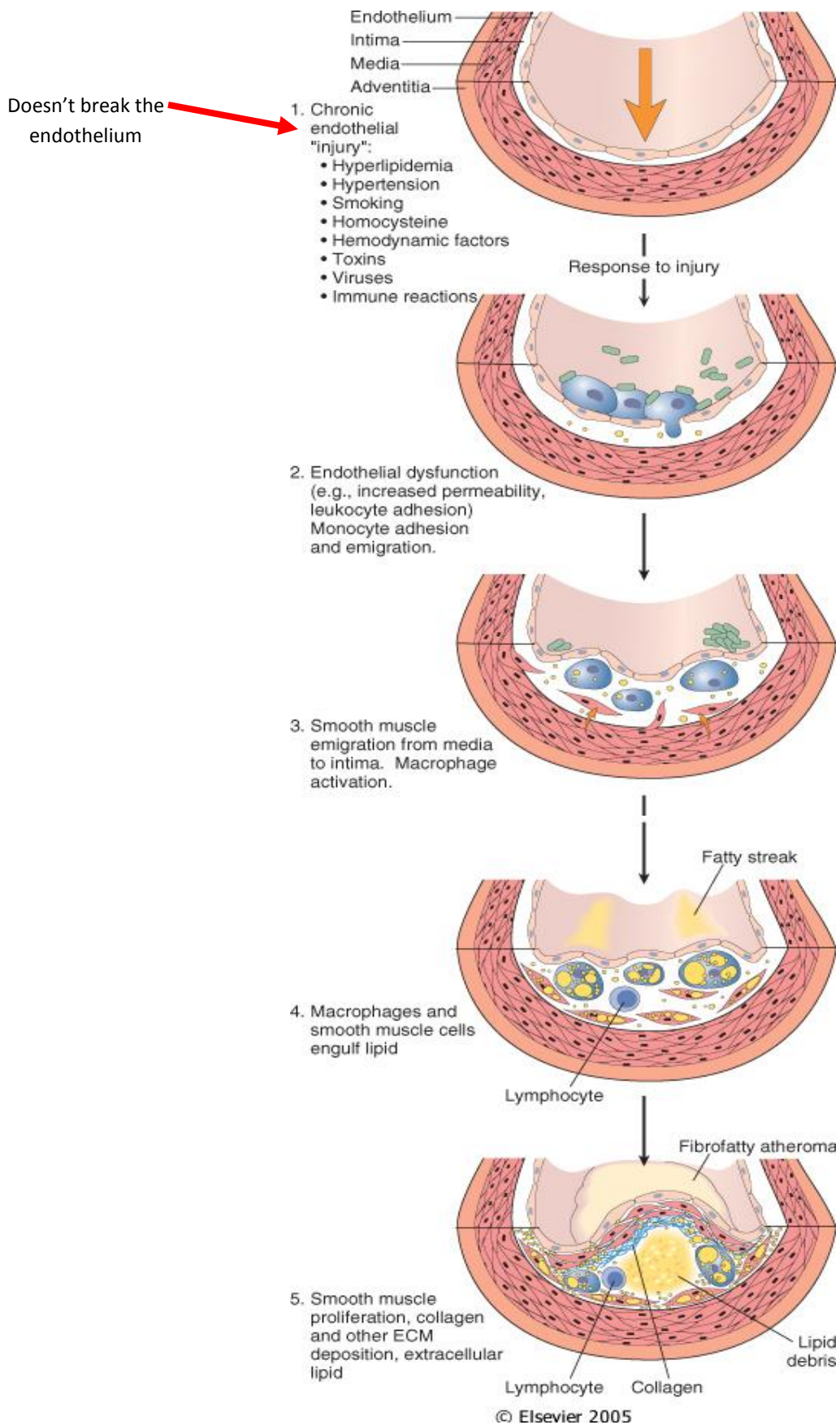
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**Fibrinoid Necrosis** → in Blood Vessels  
**Liquefactive Necrosis** → in Brain  
**Coagulative Necrosis** → in solid organs (heart)



**Risk Factors for Atherosclerosis**



**Primary Prevention Programs:** before any clinical feature  
(a person having atherosclerosis but no symptom or sign is shown)