

Arteriosclerosis

3. Atherosclerosis

inflammatory process in endothelial cells of vessel wall associated with retained low-density lipoprotein (LDL) particles

most frequent and clinically important pattern of arteriosclerosis

characterized by intimal lesions = atheromas (atherosclerotic plaques)

atheromatous plaque = raised lesion with a core of lipid (cholesterol and cholesterol esters) covered by a firm, white fibrous cap

progression:

- Aneurysm and rupture
- Occlusion by thrombus
- Critical stenosis

Types of plaque

1. Vulnerable

Thick fat core/ Thin fibrous cap/ More inflammation

2. Stable

Thin fat core/ Thick fibrous cap/ less inflammation

Definition:

- Hardening of the arteries
- Arterial wall thickening and loss of elasticity

patterns are recognized, with different clinical and pathologic consequences:

1. Arteriolosclerosis
2. Mönckeberg medial calcific sclerosis
3. Atherosclerosis

1. Arteriolosclerosis

affects small arteries and arterioles

associated with hypertension and/or diabetes mellitus

2. Mönckeberg medial calcific sclerosis

do not encroach on vessel lumen and are usually not clinically significant

calcific deposits in muscular arteries

typically in persons > age 50

radiographically visible

palpable vessels

Formation of atheromatous plaque

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graph TD; A[Formation of atheromatous plaque] --> B[Chronic endothelial injury]; B --> C[Endothelial dysfunction]; C --> D[Macrophage activation and smooth muscles recruitment]; D --> E[Macrophage and smooth muscles engulf lipids]; E --> F[Smooth muscle proliferation, collagen and other ECM deposition, extracellular lipid];
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Chronic endothelial injury

Endothelial dysfunction

Macrophage activation and smooth muscles recruitment

Macrophage and smooth muscles engulf lipids

Smooth muscle proliferation, collagen and other ECM deposition, extracellular lipid

Risk Factors for Atherosclerosis

Major Risks

Non-modifiable (non-controllable)

Increasing age

Male gender

Family history

Genetic abnormalities

Modifiable (Controllable)

Hyperlipidemia

Hypertension

Cigarette smoking

Diabetes

C-reactive protein (inflammation)

Lesser Risks

Obesity & Physical inactivity

Stress ("type A personality")

Postmenopausal estrogen deficiency

High carbohydrate intake

Hardened (trans)unsaturated fat intake

Lipoprotein(a)

Chlamydia pneumoniae infection

ages 40 to 60,
incidence of MI
in men increases 5 x

Premenopausal protected
against atherosclerosis
compared with age-matched
men

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