

Ischemic heart disease

- ▶ **Heart disease the leading cause of morbidity and mortality**

ISCHEMIC HEART DISEASE (IHD)

- ▶ IHD \approx coronary artery disease (CAD)
- ▶ IHD = a group of related syndromes resulting from myocardial *ischemia* (**an imbalance between cardiac blood supply (perfusion) and myocardial oxygen demand.**)

Ischemia can result from:

- 1- reduction in coronary blood flow**
atherosclerosis (90 %)
- 2- increased demand** (e.g., tachycardia
or hypertension)
- 3- diminished oxygen-carrying capacity**
(e.g., anemia, CO poisoning)

There are four basic clinical syndromes of IHD:

1-Angina pectoris

ischemia causes pain but is insufficient to lead to death of myocardium

2-Acute myocardial infarction (MI)

the severity or duration of ischemia is enough to cause cardiac muscle death

3-Chronic IHD

**progressive cardiac decompensation
(heart failure) following MI**

4-Sudden cardiac death (SCD)

**can result from a lethal arrhythmia
following myocardial ischemia.**

1-Angina pectoris

- intermittent chest pain caused by transient, reversible myocardial ischemia (**ischemia causes pain but is insufficient to lead to death of myocardium**)
- **pain** → a crushing or squeezing substernal
- radiate down the left arm or to the left jaw (*referred pain*).

Types of angina :

1-stable angina (occur after exertion)

**2-variant angina or Prinzmetal
angina** (due to vessel spasm)

3-Unstable angina

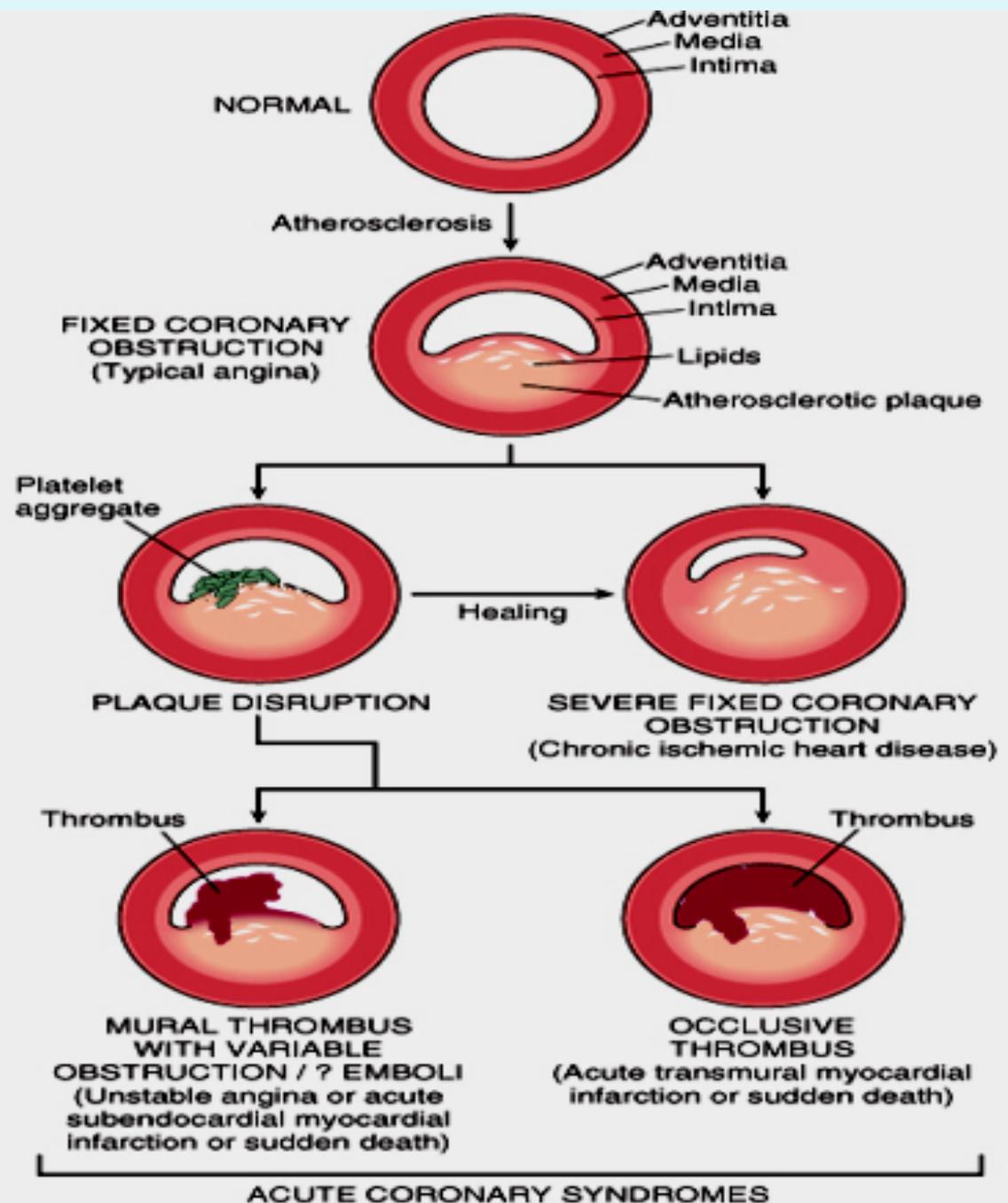
Pathogenesis of Angina

- stable (typical angina): **critical stenosis** → pain only with increased demand
- Prinzmetal angina: sudden severe coronary vasospasm
- a severe stenosis ($> 90\%$) → inadequate coronary blood flow even at rest → chronic ischemic heart disease

Pathogenesis of Angina

- ▶ **Unstable angina → critical stenosis plus: plaque disruption; superimposed partial thrombosis; distal embolization; vasospasm**
- ▶ **Myocardial infarction → a superimposed occlusive thrombus**

Pathogenesis



Clinical Features of angina & MI

- 1) Severe, crushing substernal chest pain
- 2) Discomfort that can radiate to the neck, jaw, epigastrium, or left arm.

Pain in angina versus MI

- ▶ angina pectoris → pain < 20 minutes and relieved by rest or nitroglycerin
- ▶ MI → pain lasts > 20 minutes to several hours and is not relieved by nitroglycerin or rest.

1-Typical or stable angina

-is episodic chest pain associated with exertion or other forms of increased myocardial oxygen demand (e.g., tachycardia; hypertension; fever, anxiety, fear).

1-Typical or stable angina

- associated with **critical** atherosclerotic narrowing
- **relieved by rest** (reducing demand) or by drugs (e.g. **nitroglycerin**)

2-Prinzmetal, or variant angina

- angina **occurring at rest** due to **coronary artery spasm**.
- vessels without atherosclerosis can be affected.
- The etiology is not clear
- Treatment: vasodilators (**nitroglycerin** or **calcium channel blockers**).

3-Unstable angina (crescendo angina)

- characterized by **increasing frequency** of pain, precipitated by progressively **less** exertion.
- the episodes also tend to be more **intense** and **longer** lasting than stable angina.

3-Unstable angina (crescendo angina)

- plaque disruption; superimposed partial thrombosis; distal embolization; vasospasm.
- indication of more serious, potentially irreversible ischemia (if complete luminal occlusion by thrombus)
- *Called pre-infarction angina*