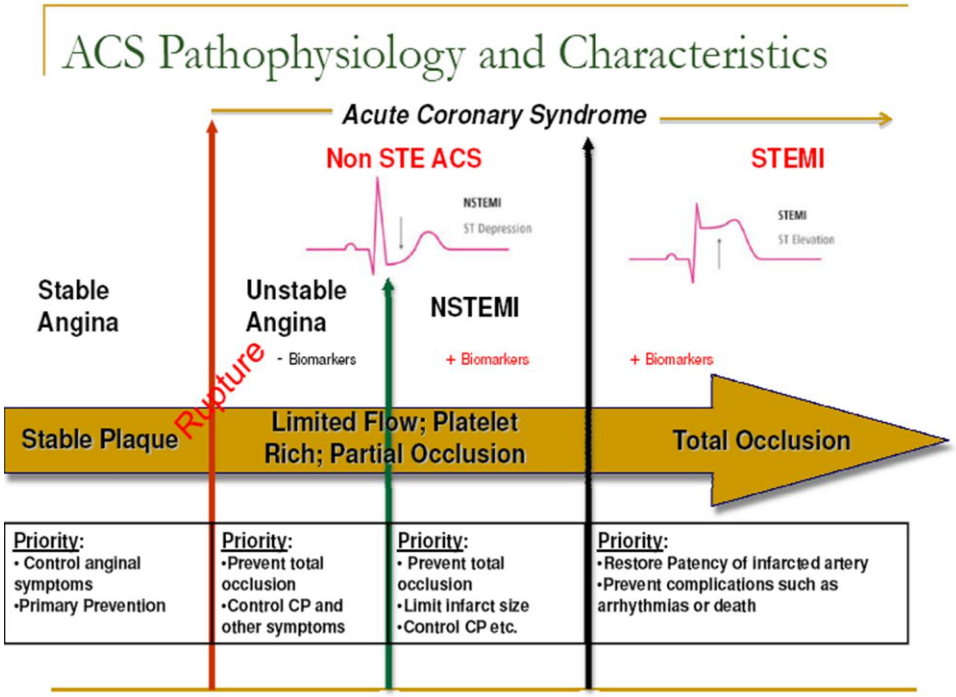
Acute coronary syndromes

Agenda

- Definitions
- Pathogenesis
- Management concepts



Definitions

- Acute coronary syndrome (**ACS**) is a spectrum of conditions compatible with acute myocardial ischemia or infarction caused by an abrupt reduction in coronary blood flow

- ***ACS can be divided into:***

✓ST-segment elevation myocardial infarction (**STEMI**)

✓Non–ST-segment elevation acute coronary syndrome (**NSTE-ACS**)

Definitions

STEMI

- **<u>Defined by:</u>**

✓ Characteristic symptoms of myocardial ischemia

✓ Persistent ST-segment elevation on ECG

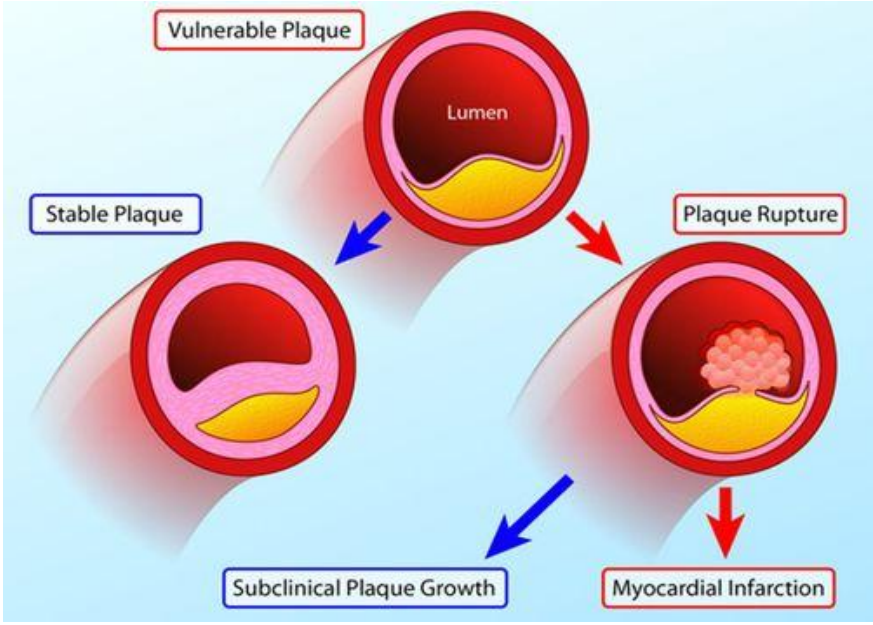
✓ Positive troponins (cardiac biomarkers)

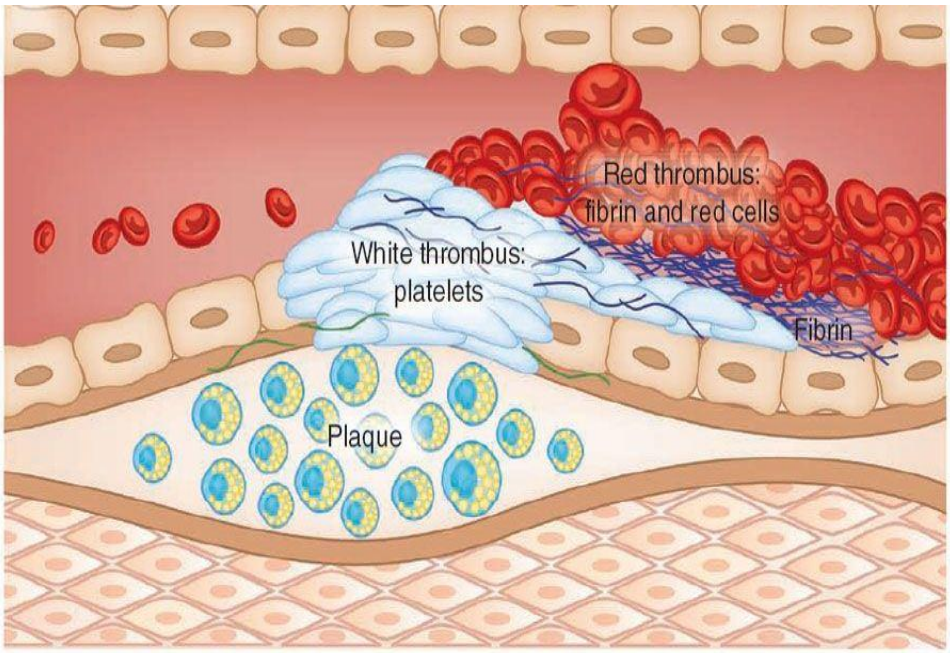
- STEMI is an indication for immediate coronary angiography to determine whether reperfusion can be done

Definitions

NSTE-ACS

- Suggested by the absence of persistent ST-segment elevation on ECG
- NSTE-ACS can be divided into unstable angina **(UA)** and **NSTEMI** according to whether cardiac biomarkers of necrosis are present or not
- UA and NSTEMI are closely related conditions whose pathogenesis and clinical presentation are similar but vary in risk and severity


Vulnerable Plaque
Lumen
Stable Plaque
Plaque Rupture
Subclinical Plaque Growth
Myocardial Infarction


Red thrombus:
fibrin and red cells
White thrombus:
platelets
Fibrin
Plaque

Pathogenesis

- Mostly ACS results from the loss of integrity of the protective covering over an atherosclerotic plaque
- This occurs with **plaque rupture** when the fibrous cap overlying the plaque gets disrupted or with erosion when the endothelial lining of the plaque is disturbed
- This disruption of the protective covering allows blood to come in contact with the highly thrombogenic contents of the necrotic core

Pathogenesis

- A breach in the fibrous cap allows circulating cellular and non-cellular elements of blood to come in direct contact with the highly thrombogenic components of the necrotic core
- This necrotic core is thought to be directly responsible for the actual development of the thrombus

Pathogenesis

- At the rupture site, the luminal thrombus is often platelet-rich, thereby giving rise to a grossly white appearance (**white thrombus**)

- While at the proximal and distal ends near the sites of propagation of the thrombosis, it appears red (**red thrombus)**, as it is composed of layers of fibrin and red blood cells

- **Over time, thrombus healing is characterized by**

✓ Infiltration of smooth muscle cells
✓ Accumulated extracellular matrix proteins (i.e. Collagen)
✓ Neovascularization
✓ Luminal surface re-endothelialization