- Pathology of Endocarditis
- Dr: Salah Ahmed

- **Endocarditis** includes: 1- Infective endocarditis (IE)
  2- nonbacterial thrombotic endocarditis
  3- Libman - Sacks endocarditis:

I- Infective endocarditis:

- is a serous infection requiring early diagnosis and intervention
- is characterized by: 1- microbial invasion of endocardium (valves)
  2- destruction of underlying cardiac tissues
  3- formation of bulky friable bacterial vegetations (microorganisms, fibrin, platelets and inflammatory cells)
- is caused by: 1- bacteria (majority of cases)
  2- fungi

- is classified into:

1- Acute: - infection by highly virulent organisms (S. aureus, beta hemolytic streptococci, pneumococci)
- occurs in previously normal heart
- causes death in more than 50% of patients despite therapy
- rapidly developing fever with rigors, malaise

- embolic complication is common

2- Subacute: - infection by low virulent organisms (St. viridans, enterococci)

- occurs in previously abnormal heart
- most patients recovering after therapy
- malaise, low grade fever, flu-like symptoms
- embolic complication less common

- **Pathogenesis:**

- blood-borne bacteria reach the valvular endocardium, from:

a) infections elsewhere in the body

b) intravenous drug abuse

c) dental or surgical procedures

- damage to endocardium, exposure of subendothelium connective tissue to blood, formation of (sterile) small thrombi
- Bacterial invasion of thrombi and bacterial vegetations formation
- The vegetations may: 1- erode into underlying myocardium (ring abscess)

2- detach and impact distant sites (septic emboli = septic infarct)

- neutropenia, immunodeficiency, malignancy, immunosuppression therapy, DM, prosthetic valves, cardiac catheter increase the risk of IE

- **Morphology:**

- friable bulky vegetations are present on valves (single or multiple)
- mitral and aortic valves are most commonly involved
- tricuspid valve involved commonly in intravenous drug abuse

- **Clinical features:**

- fever
- vegetations can embolize producing abscess and infarctions in distant sites (e.g. embolic stroke, splenic and kidney infarcts etc.)
- valve destruction leads to regurgitation murmurs and CHF.
- extension of infection into heart (abscess)
- immune complex vasculitis:
    1- Roth's spot (hemorrhages) in retina
    2- Splinter hemorrhages in nail beds
    3- Osler's node (painful) on hands and feet
    4- Janeway lesions in hand and feet (painless)
    5- Glomerulonephritis

•- valve destruction
- immune complex vasculitis: Roth's spot, Splinter hemorrhage, Osler's node, Janeway lesion

- **Investigations:**
  1- blood culture
  2- CBC (leucocytosis, increased ESR)
  3- echocardiography
- **Diagnosis:**- confirmed by Duke criteria (2 major, 1 major + 3 minors or 5 minors are required for diagnosis)

Duke criteria:

Major: 1- positive blood culture
2- echocardiography findings (vegetations, abscess)
3- new valvular regurgitation

Minor: 1- predisposing heart lesion
2- intravenous drug abuse
3- vascular lesions (hemorrhage, emboli)
4- immunological phenomena (glomerulonephritis
5- blood culture (showing uncharacteristic organisms
6- echo findings (not diagnostic of endocarditis

- **Complications:**

1- valve regurgitation
2- myocardial ring abscess or perforation
3- myocarditis

4- congestive heart failure
5- arrhythmias
6- septicemia
7- glomerulonephritis and so renal failure
8- systemic embolization with development of septic infarct

II- Nonbacterial thrombotic endocarditis:

- is characterized by deposition of thrombi (fibrin, platelets, other blood components) on valves
- occurs in previously normal valves
- no microorganisms (sterile vegetations)
- not lead to valve damage
- can embolize

• Pathogenesis:

- predisposed by: - hypercoagulable states:
  1- sepsis with DIC
  2- hyperestrogenic state
  3- underlying malignancy (mucinous adenocarcinoma)
  - endocardial trauma (catheters)
- the diagnosis based largely on: 1- predisposing conditions 2- embolic stroke

III- Libman -Sacks endocarditis:

- occurs in SLE due to immune complex deposition
- involves mitral valve
- embolization is uncommon