Diseases of the Heart: Valve

Infective Endocarditis

- Microbial infection of the heart valve
- Endo - Inner layer
  Card > Heart itis > Inflammation.
- Usually streptococcus, staph and other organism are also involved.

Microbiology

Most Common

1) Streptococci
   - Low ← Virulence → High. Staphylococcus aureus
   - Dental Brushing during ← Mouth ← Source → Skin (Intravenous drug abuse)
   - Previously damaged ← Valve Attacked → Damaged & Healthy (Tricuspid valve).
   - Small ← Vegetations → Large
   - Absent ← Valve destruction → Prevent

2) Staphylococcus Epidermidis
   - Prosthetic valve
   - Transmission → Valve Surgery, Intravenous Catheter } Nosocomial

3) Enterococcus Faecalis & Streptococcus Bovis.
   - Normal GUT flora
   - when affected by Severe Colorectal disease. (CA or IBD)
   - Flora enters the Blood stream
   - IE.

4) Coxiella Burnetti
   - Infected animal → Q Fever
     (Cow, sheep, Goat)
   - After month → Endocarditis in Immunocompromised, Pregnant, Valve destruction
   - Only seen

5) HACEK Group → Gram Negative found in mouth/gut

H - Haemophillum
A - Aggregati Bacter
C - Candiobacterium
E - Eikenella
K - Kingella

6) Fungi → Candidia & Aspergillus

→ In Previously damaged or Prosthetic valves.
→ Immunocompromised people
→ Indwelling intravenous catheter.

Pathophysiology

Turbulence of Blood flow
↓
Damage to endocardial lining
↓
Exposure of collagen & Tissue factor
↓
Platlets & Fibrin adhere
↓
Thrombosis (Non-Bacterial Thrombotic endocarditis).
NBTE
↓
Bacteria Infection
↓
Adherence adhere to Thrombus with Biofilm (Collagen)
↓
"Vegetations" → In low pressure area

In Mitral regurgitation atrial surface of valve

↓ Break Foam

In aortic regurgitation ventricular surface of the valve.

Septic Emboli.

1) Subacute bacterial Endocarditis

- Low Virulent bacteria in previously diseased heart. Run a course of gradual 6 weeks to few months, or year.

C/F:

- Fever, Weight loss, Tiredness, Non-Visible Haematuria
- Murmurs of underlying disease.

i) Splinter Haemorrhage → Under Finger nails.

ii) Janeway lesions → In Palms & Sole. Small, Painless. flat, erythematous lesions.

iii) Osler Nodes → Due to antigen & Antibody complex forming Vasculitis.

- In Finger & Toes, large. painful tender Swellings.

iv) Roth spots → Eyes due to antigen antibody complex

v) Glomerulonephritis →

2) Acute bacterial Endocarditis

- High Virulent bacteria in normal heart. Runs in sudden onset, 2-6 weeks.
- Symptoms of Subacute are absent
- Embolic events are common.
- Cardiac and renal failure are common.
- Abscess are common.

3) Post operative Endocarditis

- Unexplained fever after a heart valve surgery due to injection by Staphylococcus Epidermidis.

Complication

1) Emboli from left heart → Enter systemic circulation causing infarcts, abscess, mycotic aneurysm in brain, kidney & spleen.
2) Right side → Pulmonary abscess
3) Petechiae.
4) Focal ~~Nec~~ Necrotising glomerulonephritis.

Investigation

① Multiple Positive Blood Culture.
② Echocardiography → Vegetation, 2-4 mm in size and difficult to differentiate between the abnormal valves.
③ ECG → AV block due to aortic root abscess
④ Chest X ray → Cardiac failure.
⑤ Serology → ↑CRP, ↑ESR, Normocytic & Normochromic anemia.
⑥ Urine → Proteinuria, Invisible haematuria.

Prevention:

- Before Dental Procedures antibiotics.

Libman - Sacks Endocarditis.

- Not injection relation
- In SLE, antigen antibody complex damages endocardium.