

Cardiac pathology lecture 7

VALVULAR HEART DISEASE

by

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- **Clinical Features**

- Acute RF appears most often in **children aged 5 to 15 years**, but about 20% of first attacks occur in adults.
- Typically, the symptoms occur **two to three weeks** after an episode of **streptococcal pharyngitis**.
- **Cultures for streptococci are negative by the time clinical illness begins.**
- **Antibodies to one or more streptococcal antigens (streptolysin O or DNAase) can be detected in most patients.**

- The predominant clinical manifestations are **arthritis** and **carditis**; arthritis is far more common in adults.
- It typically begins with **migratory polyarthritis** accompanied by fever in which **one large joint** after another becomes painful and swollen for a period of days and then subsides spontaneously, leaving no residual disability.

- Clinical features of the carditis include: pericardial friction rubs and arrhythmias.
- **Myocarditis** can be so severe that resulting cardiac dilation causes functional **mitral insufficiency** and even **CHF**.
- Less than 1% of patients die of acute RF.

- After an initial attack there is increased vulnerability to disease reactivation with subsequent pharyngeal infections.
- Carditis is likely to worsen with each recurrence, and damage is **cumulative**.

Complications:

- Thromboembolism
- Infective Endocarditis.
- Mitral valve stenosis.
- Atrial fibrillation in the setting of mitral stenosis.

Diagnosis of acute :

is made by: **serologic evidence of a previous streptococcal infection**, in conjunction with **two** or more of the following *Jones criteria*:

1. Carditis.
2. Migratory polyarthritis.
3. Subcutaneous nodules.
4. Erythema marginatum of the skin.
5. Sydenham chorea, a neurologic disorder with involuntary purposeless, rapid movements.

- **One of the Jones criteria** manifestations and **two minor** manifestations:
 1. Fever.
 2. Arthralgia.
 3. Elevated blood levels of acute-phase reactants.

Infective Endocarditis

- Is the **microbial invasion of heart valves** or mural endocardium-often with destruction of the underlying cardiac tissues-and results in bulky, friable **vegetations** composed of **necrotic debris, thrombus, and organisms.**
- The vast majority of cases are caused by **bacteria.**
- fungi, rickettsiae (Q fever), and chlamydiae can cause endocarditis.

Comparison

<u>Character</u>	<u>Acute</u>	<u>Subacute</u>
Onset	Rapid	Insidious
Duration	Days to weeks	Weeks to months
Organism	Highly virulent	Low virulence
Valve	Previously Normal	Previously Abnormal
Course	>50 % of patients die	Most patients recover
Destruction	More valve destruction	Less valve destruction
Granulation tissue	Present	Absent

- The **aortic** and **mitral valves** are the most common sites of infection
- The tricuspid valve is a frequent target in the setting of intravenous drug abuse.
- Vegetations may be single or multiple and may involve more than one valve; they can erode into the underlying myocardium to produce an abscess cavity (ring abscess).

- **Systemic emboli** may occur at any time because of the friable nature of the vegetations.
- Because the embolic fragments contain large numbers of virulent organisms, abscesses often develop at the sites of such infarcts (**septic infarcts**).

- **Pathogenesis**

- IE can develop on previously **normal valves**

- Cardiac abnormalities predisposes to such infections:

- Mitral valve prolapse.

- Bicuspid aortic valves.

- Calcific valvular stenosis.

- Prosthetic heart valves.

- Sterile platelet-fibrin deposits at sites of jet streams

- RHD.

➤ Predisposing Host factors:

- Neutropenia.
- Immunodeficiency.
- Malignancy.
- Therapeutic immunosuppression.
- Diabetes mellitus.
- Alcohol.
- Intravenous drug.

- The causative organisms:

- *viridans Streptococci* (oral flora; abnormal valve)
- *S. aureus* (normal or abnormal valves; IV drug abusers)
- enterococci and the so-called HACEK group (*Haemophilus*, *Actinobacillus*, *Cardiobacterium*, *Eikenella*, and *Kingella*), all commensals in the oral cavity.
- More rarely, gram-negative bacilli and fungi are involved.
- In about 10% of cases, no organism can be isolated from the blood ("culture-negative" endocarditis).

- **Clinical Features**

- **Fever** is the most consistent sign of IE.
- in subacute disease (particularly in the elderly) fever may be absent, and the only manifestations may be nonspecific fatigue, weight loss, and a flulike syndrome.
- **Splenomegaly** is common in subacute IE.
- Acute endocarditis has a stormy onset with rapidly developing **fever, chills, weakness, and lassitude**.

- **Murmurs** are present in 90% of patients with left-sided lesions, but these may merely relate to the pre-existing cardiac abnormality predisposing to IE.
- **Clinical findings due to microemboli** are:
 - Petechiae,
 - Hemorrhages under the nail bed,
 - Subcutaneous nodules in the pulp of digits.

- **Diagnosis** is largely made on the basis of
 - **Positive blood cultures,**
 - Echocardiographic findings
 - Other clinical and laboratory findings.

- Complications :

- **Glomerulonephritis** due to glomerular trapping of antigen-antibody complexes, thus giving rise to hematuria, albuminuria, or renal failure.
- **Septicemia**
- **Arrhythmias**
- Systemic **embolization**.

- **Noninfected Vegetations**

- **Nonbacterial Thrombotic Endocarditis**

- Is characterized by the deposition of variably sized masses of **fibrin, platelets**, and other blood components on cardiac valves.
- The valvular lesions of NBTE are **sterile**.
- Valvular damage is **not a prerequisite** for NBTE.

- **Pathogenesis**

- NBTE typically occurs in the setting of **hypercoagulable** states:

- Sepsis with disseminated intravascular coagulation,
- Hyperestrogenic states,
- Underlying malignancy, particularly mucinous adenocarcinomas.

- Endocardial trauma is a predisposing factor.

- Clinical Features

- NBTE lesions can become clinically significant by **embolizing** to the brain, heart, or other organs.
- NBTE can also serve as a potential nidus for bacterial colonization and thus the development of **IE**.

Embolizing

Nidus for IE

➤ Libman-Sacks Endocarditis

- Sterile vegetations on the valves of patients with **SLE**.
- Because of **immune complex deposition** and thus have associated inflammation.

- **Carcinoid Heart Disease**
- **Home work???**

Thank
you