Myocarditis and pericarditis

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Introduction

- Myocarditis is inflammatory disease of the heart muscle.
- Mild & self-limited with few symptoms or severe with progression to CHF & dilated CM
- Very localized or diffuse
- Myocarditis can be due variety of infectious and non infectious causes
- Viral infection is the most common cause
- Others like toxin drugs and hypersensitivity immune.

Infectious	Noninfectious
Viruses – 1. Coxsackie B 2. HIV	Systemic Diseases: 1. SLE 2. Sarcoidosis 3. Vasculitides(Wegener's) 4. Celiac disease
Bacterial – 1. Corynebacterium diphtheriae	Neoplastic infiltration
Protozoan – 1. Trypanosoma cruzi (Chagas disease)	Drugs & toxins: 1. Ethanol 2. Cocaine 3. Radiation 4. Chemotherapeutic agents - Doxorubicin
Spirochete 1. Borrelia burgdorferi (Lyme disease)	

Etiology, Epidemiology and Risk Factors

- Epidemiology not accurate estimate of incidence as many cases are mild & brief and diagnosis is not made.
- **Coxsackievirus B** is the most common cause of myocarditis
- **Other virus** like coxsackievirus A, other echoviruses, adenoviruses influenza, EBV, rubella, vericella, mumps, rabies, hepatitis viruses and HIV.
- **Bacterial causes** include corynebacterium diptheriae, syphilis Lyme disease or as a complication of bacterial endocarditis.

- **A parasitic** cause includes chagas diseases, trichinella spiralis, taxoplasma gondii and Echinococcus.
- **Other** includes rickettsia, fungi, Chlamydia, enteric pathogens, legionella and tuberculosis.
- **Giant cell myocarditis** due thymoma, SLE or thyrotoxicosis.

Clinical presentation

- Days to weeks after onset of acute febrile illness or with heart failure without any known antecedent symptoms; highly variable
- Fever, headache, muscle aches, diarrhea, sore throat and rashes similar to any viral infection
- Chest pain, arrhythmias or sweating fatigue and may present with congestive heart failure.

Differential Diagnosis

- Acute Myocarditis
- Vasculitis
- Cardiomyopathy ((drugs, radiation)

Diagnosis

- WBCs, ESR, Troponins and CK-MB usually elevated
- ECG (nonspecific ST-T changes and conduction delays are common)
- Blood cultures
- Viral serology and other specific test for Lyme, diphtheria and Chagas disease maybe indicated on a case by case basis.
- Chest X-rays show cardiomegaly
- Radiology MRI and Echocardiogram
- Heart muscle biopsy

Endomyocardial Bx

- Pathologic exam may reveal lymphocytic inflammatory response with necrosis, but this is not sensitive b/c of the patchy areas of distribution.
- "Dallas" criteria for histopathologic dx
- May see "Giant cells"

Management

- Often supportive;
  - Restricted physical activity in heart failure.
- Specific antimicrobial therapy is indicated when an infecting agent is identified
- Treatment of heart failure arrhythmia
- Other drugs indicated in special situations like anticoagulant, NSAID steroid or immunosuppressive immunomodulatory agents.
- Heart transplant

Management

- Most cases of viral myocarditis are self limited.
- One third of the patients are left with lifelong complications, ranging from mild conduction defects to severe heart failure.
- Patient should be followed regularly every 1-3 months.
- Sudden death may be the presentation of myocarditis in about 10% of cases.

Acute Pericarditis

Pathophysiology

- Contiguous spread
  - lungs, pleura, mediastinal lymph nodes, myocardium, aorta, esophagus, liver
- Hematogenous spread
  - septicemia, toxins, neoplasm, metabolic
- Lymphangetic spread
- Traumatic or irradiation

Pathophysiology

- inflammation provokes a fibrinous exudate with or without serous effusion
- the normal transparent and glistening pericardium is turned into a dull, opaque, and “sandy” sac
- can cause pericardial scarring with adhesions and fibrosis

Pericarditis

- Pericarditis is an inflammation of pericardium usually of infectious etiology
- Coxsackievirus A and B, echovirus are the most common causes
- Other includes herpes viruses, hepatitis B , mumps, influenza, adenovirus Varicella and HIV

- **Bacterial Pericarditis** usually complication of pulmonary infections (e.g. pneumonia empyema): *S. pneumonia, M. tuberculosis, S. aureus, H. influenzae, K. pneumoniae legionella.*
- HIV patients may develop pericardial effusions (tuberculosis *M. avium* complex).
- **Disseminated fungal infection** (Histoplasma, Coccidioides)
- **Parasitic infections** (disseminated toxoplasmosis, contagious spread of Entamoeba histolytica)are rare causes.

Types of pericarditis

- **Caseous pericarditis** commonly tuberculosis in origin.
- **Serious Pericarditis** by autoimmune diseases (rheumatoid arthritis, SLE).
- **Fibrous Pericarditis**: A chronic Pericarditis usually caused by suppurative, caseous, or encased in a thick layer of scar tissue.

Types of Effusive Fluid

- serous
  - transudative ~ heart failure
- suppurative
  - pyogenic infection with cellular debris and large number of leukocytes
- hemorrhagic
  - occurs with any type of pericarditis
  - especially with infections and malignancies
- serosanguinous

Constrictive Pericarditis

- Idiopathic
- radiotherapy
- cardiac surgery
- connective tissue disorders
- dialysis
- bacterial infection

Clinical presentation

- Patients with Pericarditis will present with sudden pleuritic chest pain, fever, dyspnea and a friction rub.
- Patient with tuberculous pericarditis has insidious onset of symptoms.
- On examination exaggerated pulsus paradoxus JVP and tachycardia.
- As the pericardial pressure increases, palpitations presyncope or syncope may occur.

Tuberculous Pericarditis

- Incidence of pericarditis in patients with pulmonary TB ranged from 1-8%
- Physical findings: fever, pericardial friction rub, hepatomegaly
- TB skin test usually positive
- Fluid smear for TB often negative
- Pericardial biopsy more definitive

Acute Pericarditis Differential Diagnosis

- Acute myocardial infarction
- Pulmonary embolism
- Pneumonia
- Aortic dissection

Diagnosis

- ECG will show ST elevation, PR depression and T-wave inversion may occur later.
- Blood culture
- Leukocytosis and an elevated ESR are typical
- Other routine testing urea and creatine.
- PPD skin test is usually positive in tuberculous Pericarditis.
- Chest x-ray may show enlarged cardiac shadow or calcified pericardium and CT scan show pericardial thickening >5mm.
- Pericardial fluid or pericardial biopsy specimens for fungi, antinuclear antibody tests and histoplasmosis complement fixation in endemic area.

Management

- Management is a largely supportive for cases of idiopathic and viral Pericarditis including bed rest and NSAIDS, Colchicine.
- Corticosteroid is controversial and anticoagulants usually contraindicated.
- Specific antibiotics must include activity against S. aureus and respiratory bacteria.
- Antiviral
- Acyclovir for herpes simplex or varicella ganciclovir for CMV etc.

Management

- Pericardiocentesis to relief tamponade.
- Patients who recovered should be observed for recurrent.
- Symptoms due to viral Pericarditis usually subsided within 1 month.
- Uremic, rheumatic, collagen in 30% of patients include pericardial effusion and tamponade, constrictive Pericarditis and pleural effusion.
- Restrictive Pericarditis and heart failure.