Pericardial Disease

Pericardial Disease - Syndromes

- Pericarditis - acute, subacute, chronic
- Pericardial effusion
- Pericardial tamponade
- Pericardial constriction

Etiology

- Idiopathic - most common cause of acute pericarditis
- Infectious - viral, bacterial, mycobacterial, fungal, protozoal
- Neoplastic
- Connective tissue disease/Vasculitis
- Post injury (post MI, postcardiotomy, post trauma)
- Radiation
- Drug (e.g. isoniazide, cyclosporin, daunorubicin)
- Metabolic (renal failure, hypothyroidism)
- Hemopericardium (trauma, complication of anticoagulation or invasive cardiac procedure)
Acute Pericarditis

- Pain - sharp, increases with inspiration, worse lying down, better sitting up leaning forward
- Exam - fever, rub
- EKG - ST elevations diffusely
- CXR - may show pleural effusions or increased heart size
- ECHO - may show pericardial effusion
- Idiopathic/viral etiology usually self-limited but can be complicated by effusion and tamponade

Pericardial Tamponade

- Fluid in pericardium -> exerts pressure on all chambers throughout cardiac cycle
- This results in elevation and equalization of diastolic pressures due to compression
- Venous return is impeded -> stroke volume decreases -> cardiac output decreases -> BP falls
Pulses Paradoxus

- Inspiration \(\rightarrow\) increased venous return \(\rightarrow\) increased RV filling \(\rightarrow\) decreased LV filling due to total cardiac volume \(\text{LV+RV}\) constricted by pericardial pressure \(\rightarrow\) drop in BP \(\geq 10\) mmHg.
Clinical Diagnosis

- Setting
- Increased JVP, exaggerated BP decline with inspiration, tachycardia, decreased pulse pressure, distant heart sounds
- ECHO - fluid, RA, RV diastolic collapse

Constrictive Pericarditis

- Thickened, scarred, sometimes calcified pericardium limits diastolic filling of ventricles.
- Etiologies - radiation, postcardiac surgery, idiopathic, tuberculosis, any cause of acute pericarditis
- Gradual progression to congested state - dyspnea, edema, ascites, weakness, liver failure (cardiac cirrhosis)

Pathophysiology

- Cardiac compression by rigid pericardium limits diastolic volume - this occurs in early diastole
- During ventricular ejection, normal surge of venous return
- At end of diastole, MV and TV open and ventricle not compressed until early rapid filling -> rapid rise in diastolic pressure (plateau)
- Pressures high and equalized
- Y descent increased in RA (JVP), LA
Pathophysiology

- No pericardial space -> no transmission of negative intrathoracic pressure to heart with respiration, no increase in venous return - no paradoxical pulse, lack of normal decrease or increase in JVP with inspiration.

Diagnosis

- History - radiation, Tb, pericarditis
- Imaging - evidence of abnormal pericardium by CXR (Ca++), Echo, or CT (thickened pericardium)
- Hemodynamics/Flow Patterns - MRI, Echo, Cath
- Biopsy - pericardium/myocardium
- Often missed
- Often uncertain of time of surgery
Differential Diagnosis

- CHF with normal EF
- Liver disease - JVP normal
- Myocardial disease
  - Restrictive cardiomyopathy (e.g. amyloid)