

# **Pericardial Disease**

## **Pericardial Disease - Syndromes**

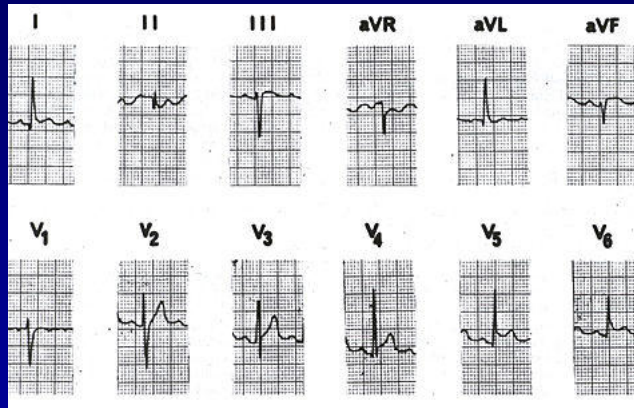
- **Pericarditis - acute, subacute, chronic**
- **Pericardial effusion**
- **Pericardial tamponade**
- **Pericardial constriction**

## **Etiology**

- **Idiopathic - most common cause of acute pericarditis**
- **Infectious - viral, bacterial, myobacterial, 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**

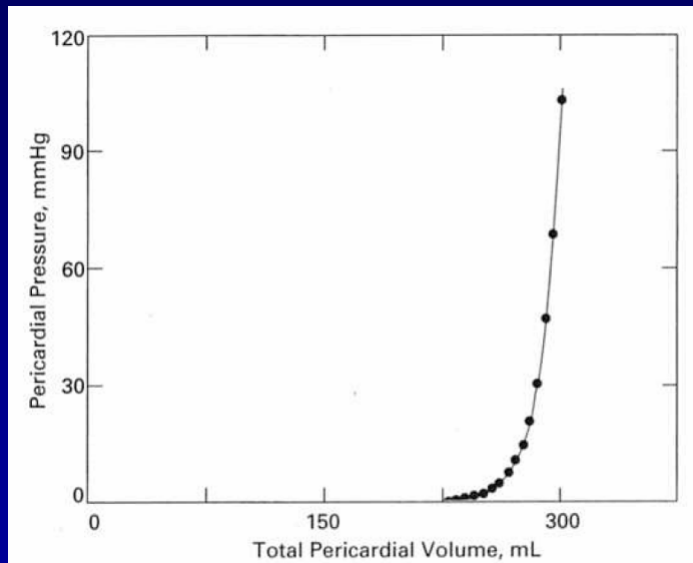
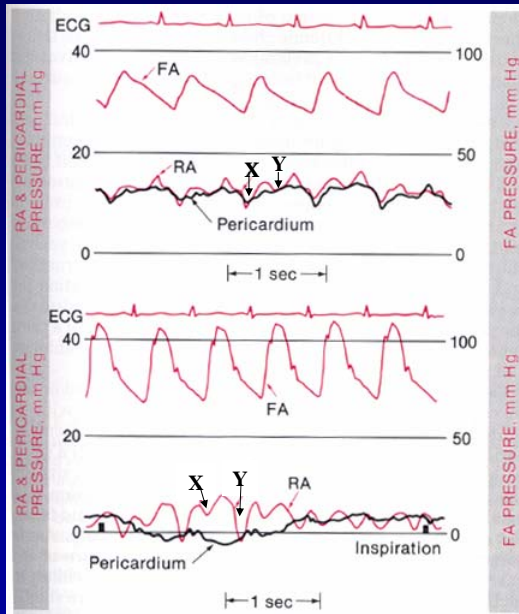


## Pericardial Tamponade

- 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

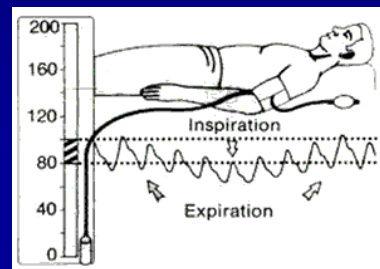
Tamponade

Normal



## Pulses Paradoxus

- **Inspiration -> increased venous return -> increased RV filling -> decreased LV filling due to total cardiac volume (LV+RV) constricted by pericardial pressure -> drop in BP > 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)**

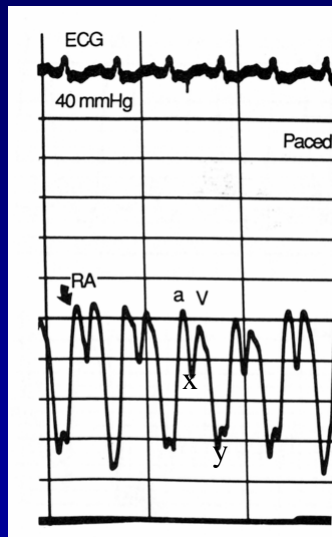
## **Pathophysiology**

- **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.

### RA Pressure Tracing Constrictive Pericarditis



## Diagnosis

- History- radiation, Tb, pericarditis
- Imaging- evidence of abnormal pericardium by CXR (Ca<sup>++</sup>), 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)