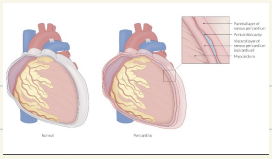


# Pericarditis :

- **Acute** : inflammation of the pericardium that either occurs as an isolated process or with concurrent myocarditis
- **Chronic** : inflammation of the pericardium that lasts > 3 months
  - Constrictive pericarditis is characterized by compromised cardiac function caused by a thickened, rigid, and fibrous pericardium secondary to acute pericarditis.

## Etiology :

1. Idiopathic
2. Infectious
   - Most commonly viral (e.g., coxsackie B virus), echovirus, adenovirus
   - Bacterial; Staphylococcus spp., Streptococcus spp., or M. tuberculosis
3. Myocardial infarction
   - Postinfarction fibrinous pericarditis; 1–3 days
   - Dressler syndrome; weeks to months
4. postpericardiotomy syndrome
5. Uremia (e.g., due to acute or chronic renal failure)
6. Radiation
7. Neoplasm (e.g., Hodgkin lymphoma)
8. Autoimmune connective tissue diseases (e.g., rheumatoid arthritis, systemic lupus, scleroderma)
9. Trauma

## Acute pericarditis :-

5

S : pleuritic
C : sharp
R : neck, shoulder (left side)
E : Deep in, cough, swallowing
R : sitting and leaning forward
A : Fever, tachypnea, cough, dyspnea

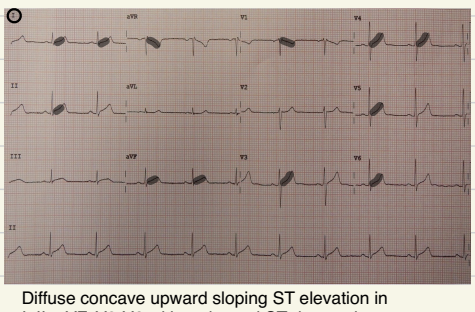
- Chest pain
  - Pleuritic chest pain
    - Acute, sharp retrosternal pain caused by inflammation of the parietal pleura
    - Typically aggravated by coughing, swallowing, or deep inspiration
  - Improves on sitting and leaning forward
  - Can radiate to the neck and shoulders (most commonly to the left side)
- Pericardial friction rub: high-pitched scratching on auscultation
  - Best heard over the left sternal border during expiration while the patient is sitting up and leaning forward
- Pericardial effusion
- Low-grade intermittent fever, tachypnea, dyspnea, nonproductive cough

In contrast to myocardial infarction, pericarditis is characterized by a diffuse distribution of ST elevations on ECG.

ECG :
1. diffuse ST elevation
2. depression PR interval
3. T wave inversion

Labs : leukocytosis

✓ (1) T wave in ✓
(2) depression PR
(3) diffuse ST



Diffuse concave upward sloping ST elevation in I, II, aVF, V3-V6 with reciprocal ST depression in aVR and V1

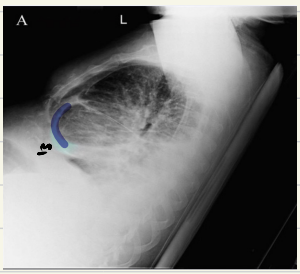
lat ← I, II, aVF
lat ← aVR, V1
Ant. ← V3-V6
inf inf
Ant. + lat.

Ant. + inf. + lat. + sep.

## Constrictive pericarditis :-

1. Symptoms of fluid overload (i.e., backward failure)
   1. Jugular vein distention, ↑ jugular venous pressure
   2. Kussmaul sign
   3. Hepatic vein congestion: hepatomegaly, painful liver capsule distention, hepatojugular reflux
   4. Peripheral edema
2. Symptoms of reduced cardiac output (i.e., forward failure)
   1. Fatigue, dyspnea on exertion
   2. Tachycardia
   3. Pericardial knock
   4. Pulsus paradoxus: ↓ blood pressure amplitude by at least 10 mm Hg during deep inspiration

- Echocardiography
  - ↑ Pericardial thickness
  - Abnormal ventricular filling with sudden halt during early diastole
- Imaging
  - CT and cardiac MRI
    - Pericardial thickening
    - Calcifications
  - Chest x-ray




Pericardial thickening and calcifications of the pericardial contour (particularly in the region of the apex; green overlay) can be seen, which indicate pericardial fibrosis. Additionally, right-sided pleural effusion and prominent perihilar lung markings (suggesting pulmonary stasis) are visible.
These radiographic features indicate constrictive pericarditis.

Cardiac catheterization
- Findings [16]
  - Similar pressures in the left and right atria and right ventricle at the end of diastole (e.g., "equalization of pressures")
  - Square root sign [4]
    - Sudden dip in the right and left ventricular pressure in early diastole followed by a plateau during the last stage of diastole

# Pericardial effusion and cardiac tamponade

## Etiology

- Hemopericardium
  - Cardiac wall rupture
  - Chest trauma
  - Aortic dissection
  - Cardiac surgery
- Serous or serosanguinous pericardial effusion [2]
  - Idiopathic
  - Acute pericarditis (especially viral, but also fungal, tuberculous or bacterial)
  - Malignancy
  - Postpericardiotomy syndrome
  - Uremia
  - Autoimmune disorders

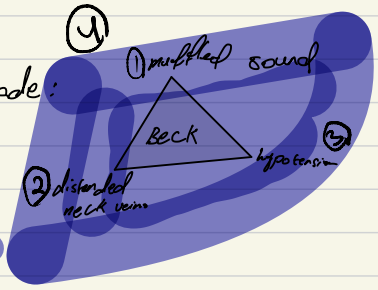
## Pathophysiology:-

Cardiac tamponade: pericardial fluid collection (e.g., bloody or serous) → ↑ pressure in the pericardial space → compression of the heart (especially of the right ventricle due to its thinner wall) → interventricular septum shift toward the left ventricle chamber → ↓ ventricular diastolic filling → ↓ stroke volume (and venous congestion) → ↓ cardiac output and equal end-diastolic pressures in all 4 chambers

## Pericardial effusion:-

- Initially asymptomatic in most cases
- Shortness of breath
- Retrosternal chest pain
- Apical impulse is difficult to locate or nonpalpable.

## Cardiac tamponade:




- Beck triad
  - Hypotension
  - Muffled heart sounds
  - Distended neck veins
- Tachycardia, pulsus paradoxus
- Pallor, cold sweats
- Left ventricular failure
- Symptoms of right heart failure
- Obstructive shock, cardiac arrest (presenting as pulseless electrical activity)

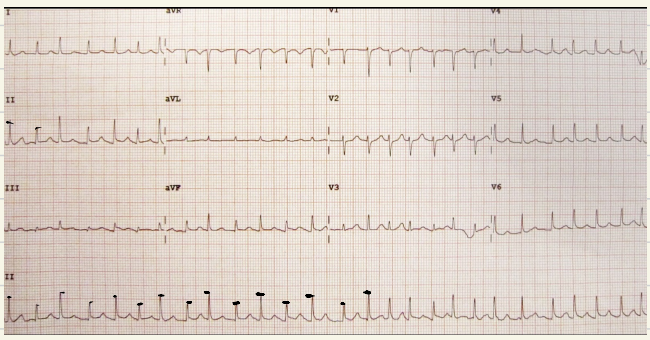
## Dx:

Echocardiography is a quick and safe diagnostic tool for detecting pericardial effusions and pericardial tamponade

1. Echocardiography
   - Procedure: TTE (gold standard)
   - Findings supportive of pericardial effusion: Can be identified using POCUS (See “Subxiphoid view" of the “FAST scan.”)
     - Anechoic space between the pericardium and epicardium
   - Echocardiographic findings supportive of cardiac tamponade [8][9]
     - Chamber collapse

## 2. ECG:

- Sinus tachycardia
- Low voltage QRS complexes
- Electrical alternans: consecutive QRS complexes that alternate in height due to the swinging motion of the heart when surrounded by large amounts of pericardial fluid



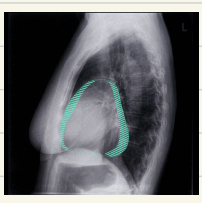
Tachycardia with a ventricular rate of approx. 150/min
- P waves are seen only rarely and there is no isoelectric line.
- Heart axis is normal (R > S in both I and aVF).
- Voltage is low and consecutive R waves alternate in height (electrical alternans).
The combination of tachycardia, a low voltage recording, and the electrical alternans morphology is highly suggestive of large pericardial effusion.

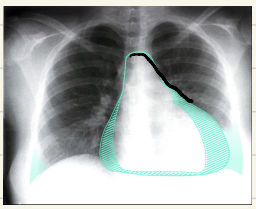
## CXR:

Chest x-ray: not required to diagnose pericardial effusion but often performed to exclude other causes of dyspnea

PA view findings

- Enlarged cardiac silhouette and clear lungs
- Water bottle sign: the radiographic sign of a large pericardial effusion in which the cardiac silhouette resembles a bottle





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