

Pericarditis

Presented by:

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Topics :

1-Introduction

2-Acute pericarditis

3-Constrictive pericarditis

4-Pericardial effusion

5-cardiac tamponade

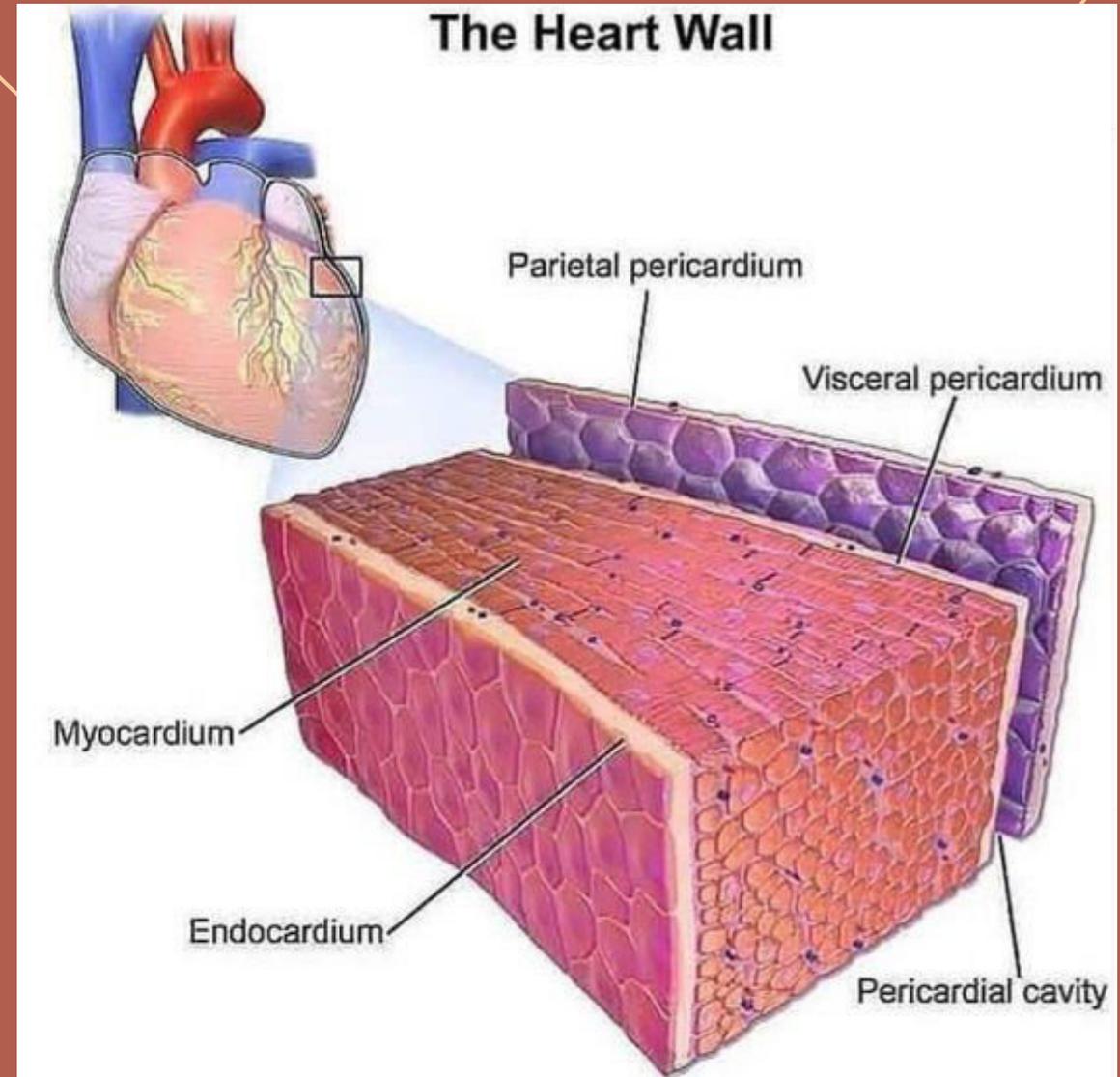
Pericardium

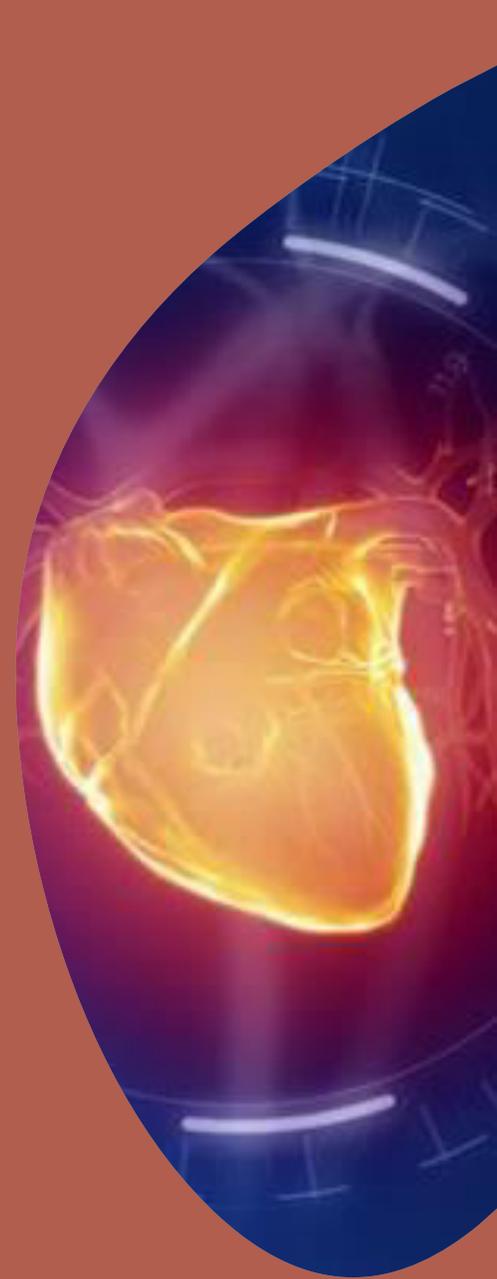
Surrounds or Covers the outside of the heart and the great vessels.

(i) Outer Fibrous Layer

(ii) Inner Serous Layer :

- VISCERAL LAYER OF SEROUS PERICARDIUM
- PARIETAL LAYER OF SEROUS PERICARDIUM
- PERICARDIAL CAVITY which contains the PERICARDIAL FLUID
- 15-50 mL of an ultrafiltrate of plasma





Acute pericarditis

Inflammation of the pericardium that either occurs as an isolated process or with concurrent myocarditis (myopericarditis)



Etiology

Idiopathic

- Postviral
- Preceded by a recent flu-like illness or upper respiratory or GI symptoms

Infectious

- Viral (e.g., Coxsackievirus, echovirus, adenovirus, EBV, influenza, HIV, hepatitis A or B)
- Bacterial (tuberculosis, Staphylococcus spp., Streptococcus spp) fungal, toxoplasmosis

After MI

- Postinfarction fibrinous pericarditis: **within 1–3 days** as an immediate reaction
- Dressler syndrome: **weeks to months** after an acute myocardial infarction

Uremia

- due to acute or chronic renal failure

Collagen vascular diseases

- SLE, scleroderma, rheumatoid arthritis, sarcoidosis

Neoplasm

- especially Hodgkin lymphoma, breast, and lung cancer

Hydralazine :antihypertensive safe in pregnancy but it induces sleep like symptoms +Ana-antidsDNA

Drug-induced
lupus syndrome

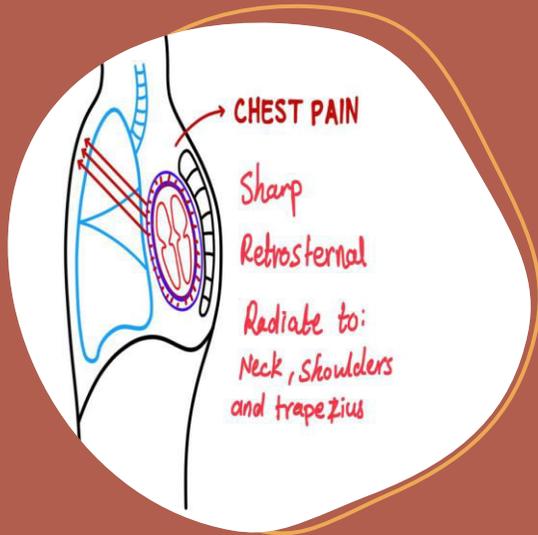
- (procainamide, hydralazine)

Radiation

- **Exudative pericarditis**: develops acutely during or after radiation therapy
- **Constrictive pericarditis**: develops several years after radiation therapy

Trauma

CLINICAL MANIFESTATIONS



1-CHEST PAIN

Acute, sharp retrosternal pain

Aggravated by coughing, swallowing, supine position or deep inspiration

Improves on sitting and leaning forward

Can radiate to the neck and shoulders



2- Low-grade intermittent fever



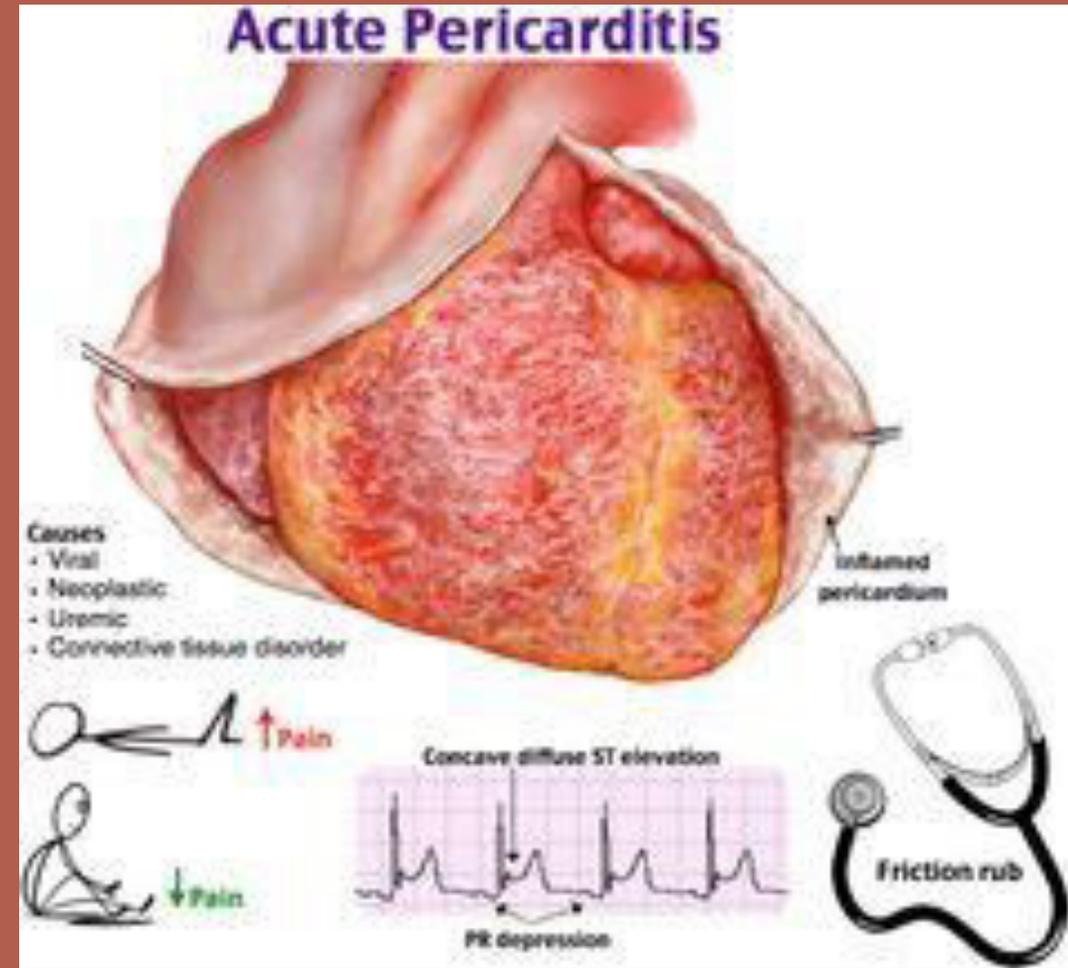
3-Nonproductive cough



4- Dyspnea & Tachypnea

Criteria for diagnosis:

1. Characteristic chest pain
2. Pericardial friction rub
3. Typical ECG changes
4. New or worsening pericardial effusion



On physical examination :

Pericardial friction rub

Caused by friction between visceral and parietal pericardial surfaces.

Scratching, high-pitched sound

Occur in :

- Atrial systole (presystolic)
- Ventricular systole (loudest and most frequently heard)
- Early diastole

Best heard over the left sternal border at end of **expiration** with patient sitting up



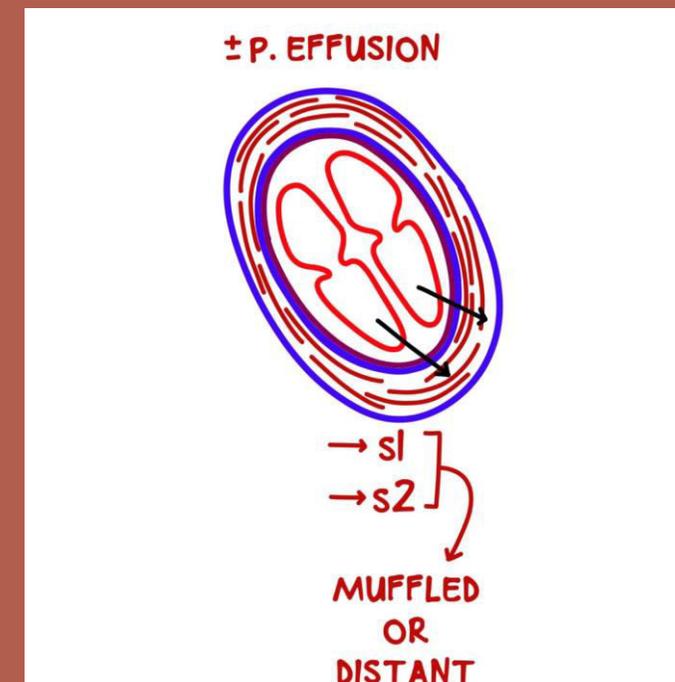
On physical examination :

If there is **Pericardial effusion**

Faint heart sounds

those sounds travel through the fluid

The sound muffled, distant and generally decrease



ECG shows four changes in sequence



Stage 1

- diffuse ST elevations, ST depression in **aVR and V1**, PR segment depression

Stage 2

- ST segment normalizes in ~ 1 week

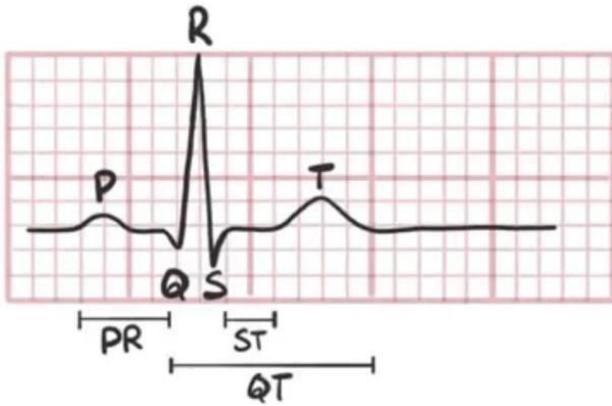
Stage 3

- inverted T waves

Stage 4

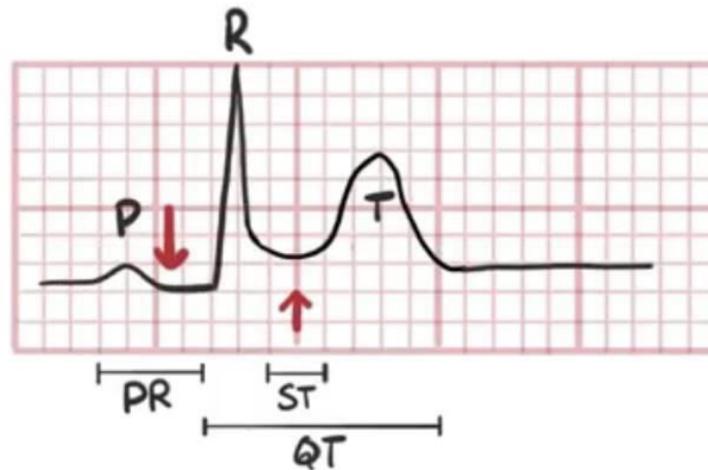
ECG returns to normal baseline (as prior to onset of pericarditis) after weeks to months

NORMAL ECG



Note from doctor :
Precardist post MI
diffused st elevation and pr
depression
Reinfarction:
ST elevation at group and
PR depression in other
group

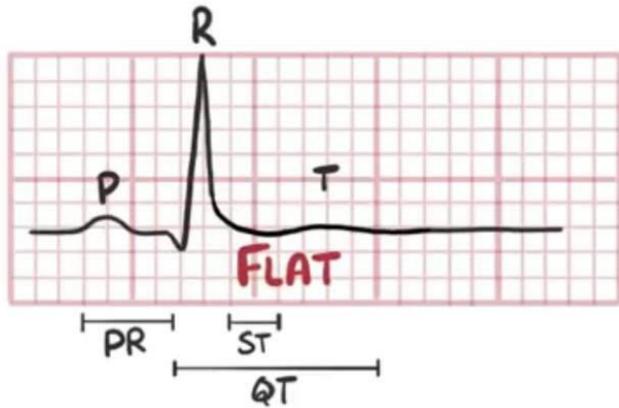
ACUTE PERICARDITIS STAGE I



Diffuse ST elevation
PR segment depression

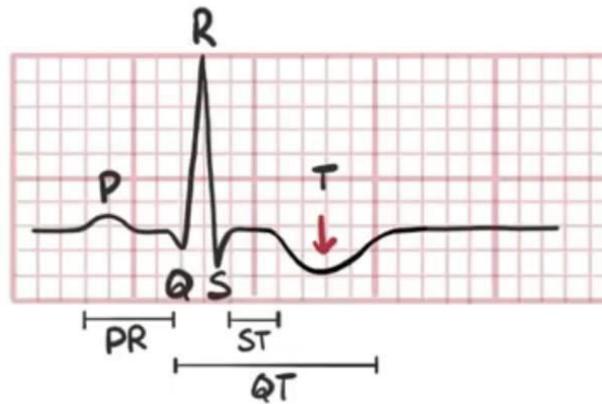
One case of MI
happen diffuse ST
elevation =
massive MI left
main coronary
occlusion

ACUTE PERICARDITIS STAGE II



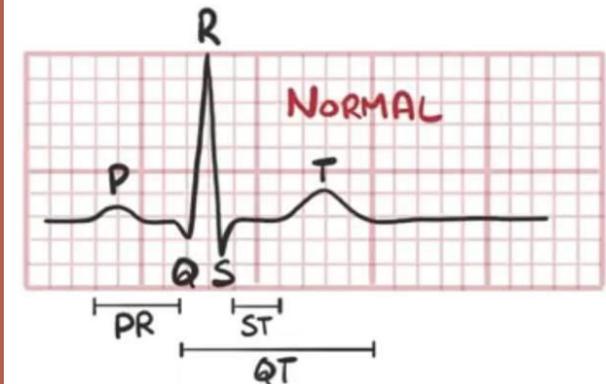
ST segment normalizes in ~ 1 week

ACUTE PERICARDITIS STAGE III

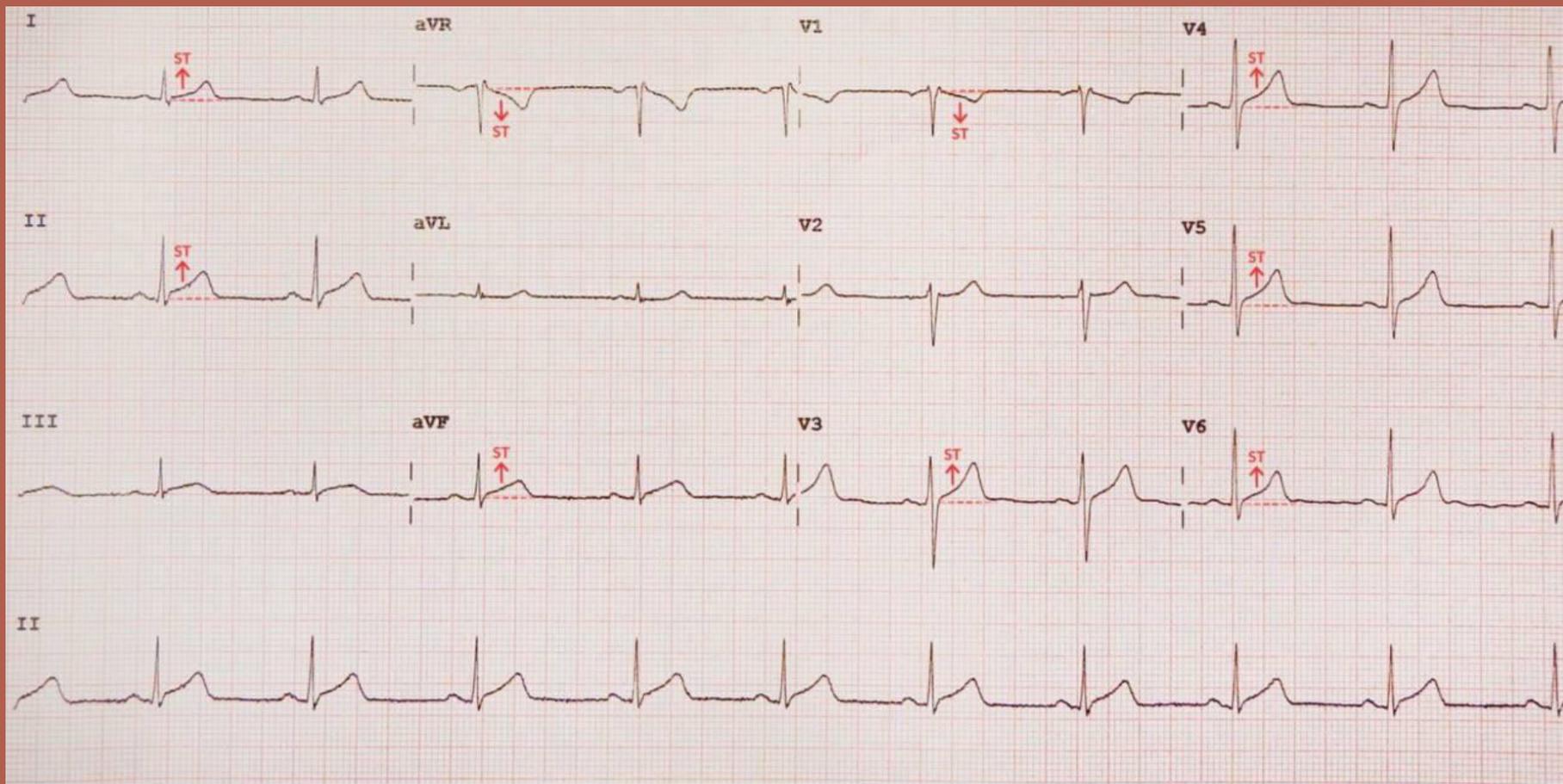


inverted T waves

ACUTE PERICARDITIS STAGE IV



ECG returns to normal baseline



To aid your diagnosis:

Echocardiography

pericardial effusion may be present, often normal

CT scan and MRI

may also show pericardial thickening and calcifications, and can aid greatly in the diagnosis.

Lab findings :

- CBC :leukocytosis
- ↑ Troponin I (could be **minimally** elevated)
- ↑ ESR
- ↑ CRP
- ↑ Creatinine kinase (if associated myocarditis)



Treatment :

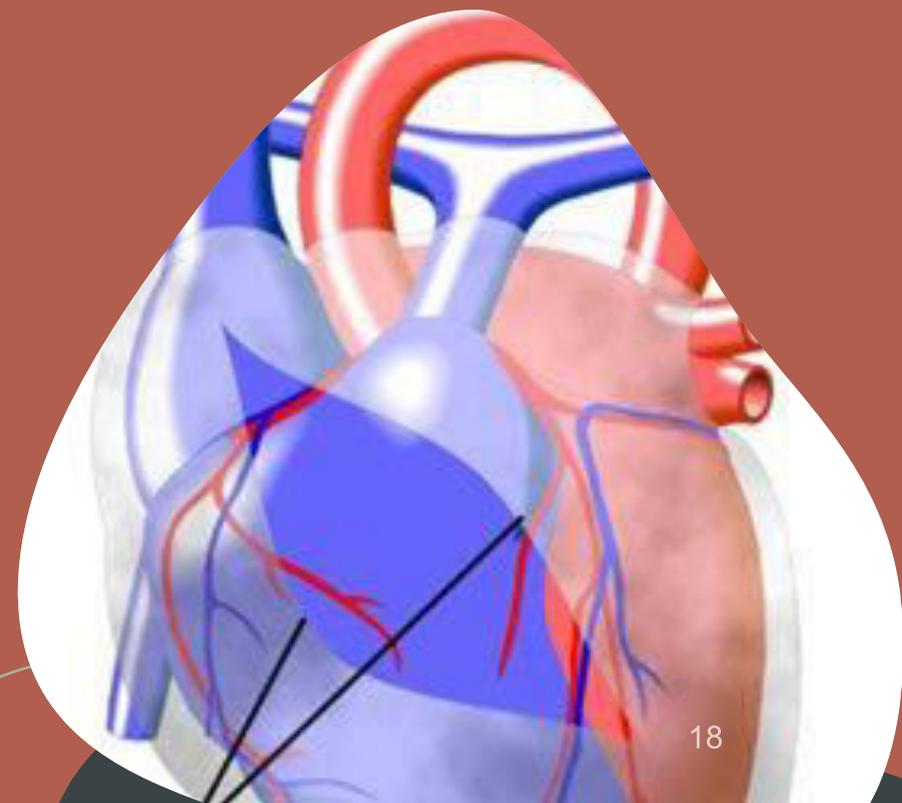
1. Most cases are self-limited and resolve in 2 to 6 weeks.
2. Treat the underlying cause if known.
3. First-line therapy is high-dose NSAIDs (aspirin, ibuprofen, naproxen, or indomethacin)

. If it fail give Colchicine

1. Glucocorticoids may be tried if pain does not respond to NSAIDs, but should be avoided if at all possible, as they are associated with a high rate of recurrent pericarditis
2. Relatively uncomplicated cases can be treated as an outpatient. However, patients with more worrisome symptoms such as fever and leukocytosis and patients with worrisome features such as pericardial effusion should be hospitalized.

2-Constrictive pericarditis:

Is characterized by compromised cardiac function caused by a thickened, rigid, and fibrous pericardium

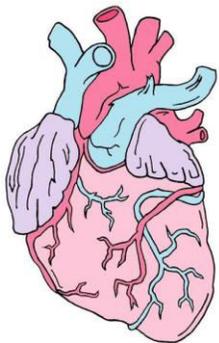


2-Constrictive pericarditis



Pathophysiology

- A. fibrotic, rigid pericardium restricts the diastolic filling of the heart
- B. Ventricular filling is **unimpeded during early diastole** because **intracardiac volume has not yet reached the limit** defined by the stiff pericardium.
- C. When intracardiac volume reaches the limit set by the noncompliant pericardium, ventricular filling is halted abruptly.



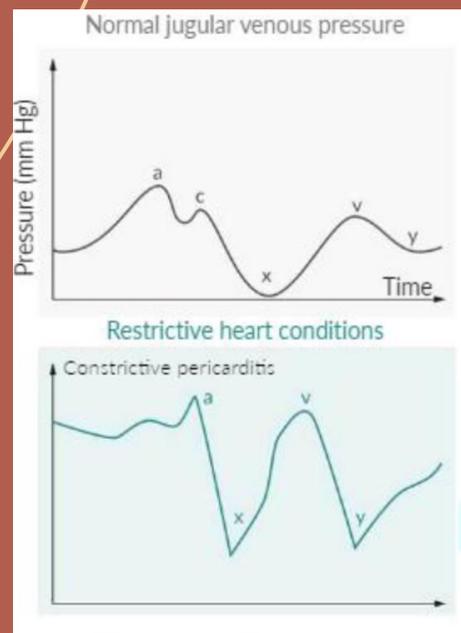
Clinical Feature

Symptoms of fluid overload

1. Jugular vein distention, \uparrow jugular venous pressure
2. Prominent x descents and y descents in jugular venous pressure
3. Kussmaul sign :a markedly raised JVP which rises paradoxically with inspiration
4. Hepatic vein congestion
5. Peripheral edema or anasarca , ascites

Symptoms of reduced cardiac output

1. Fatigue, dyspnea on exertion
2. Tachycardia
3. Pericardial knock: sudden cessation of ventricular filling that is heard best at the left sternal border
4. Pulsus paradoxus: decreased blood pressure amplitude by at least 10 mm Hg during deep inspiration



Diagnosis :

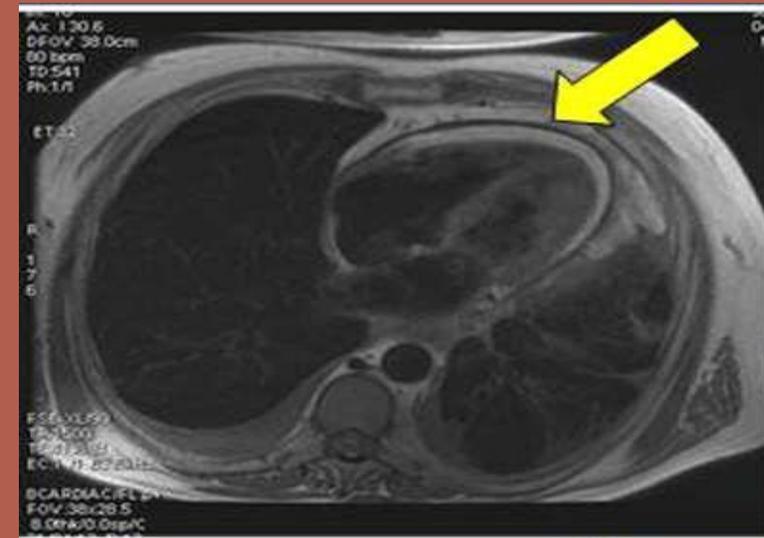


1. ECG

- Nonspecific changes such as low QRS voltages, generalized T-wave flattening or inversion, left atrial abnormalities.
- AFib is more often seen in advanced disease

2. Echocardiogram

- ↑ Pericardial thickness



3. CT scan and MRI

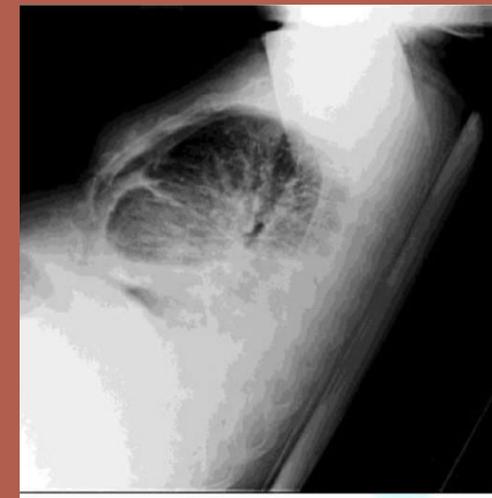
- Pericardial thickening > 2 mm
- Calcifications



Diagnosis :

4. Chest x-ray (PA and lateral views)

- a. Heart size: normal or slightly increased
- b. Pericardial calcifications





Treatment

- Treat the underlying condition.
- Diuretics may be extremely helpful in treating fluid overload symptoms
- Surgical pericardiectomy

PERICARDIAL EFFUSION

3-pericardial effusion

An accumulation of fluid in the pericardial space between the parietal and visceral pericardium.

Normally 10-50 mL

May be acute < 3 months or chronic > 3 months .



Etiology :

Hemopericardium:

- May be due to post MI due to free ventricular wall and septal rupture , anyursem (e.g., complication of MI)
- Chest trauma
- Aortic dissection
- Cardiac surgery

Serous pericardial effusion

- Idiopathic
- Acute pericarditis
- Malignancy
- Postpericardiotomy syndrome
- Uremia
- Autoimmune disorders
- Hypothyroidism
- Right heart failure

Clinical Features

1. Initially asymptomatic in most cases
2. Constitutional symptoms FAHM
3. Shortness of breath, especially when lying down (orthopnea)
4. Chest pain may be typically as pericarditis, or it may be dull and heavy due to distension of the pericardium
5. Can cause compressive symptoms

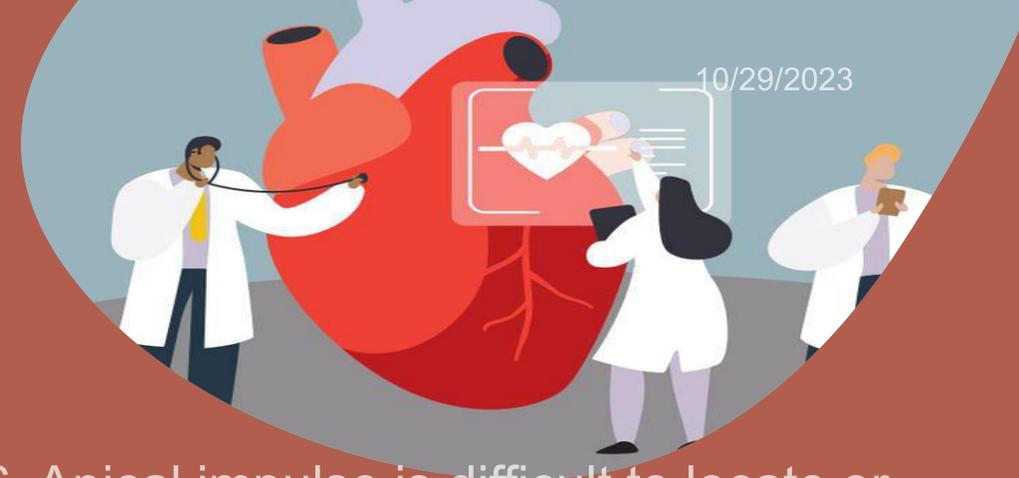
-Hoarseness

-Nausea

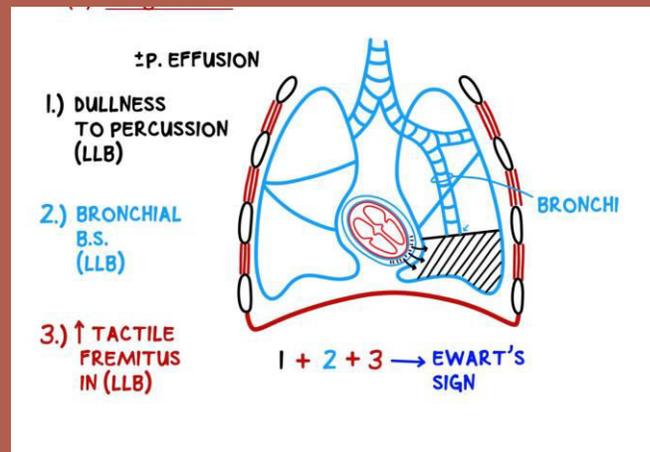
- Dysphagia

- Hiccups

- cough



6. Apical impulse is difficult to locate or nonpalpable
7. Ewart sign: dullness to **percussion** at the base of the left lung & increased **vocal fremitus** and **bronchial breathing** due the compression of lung parenchyma by the pericardial effusion



Diagnosis

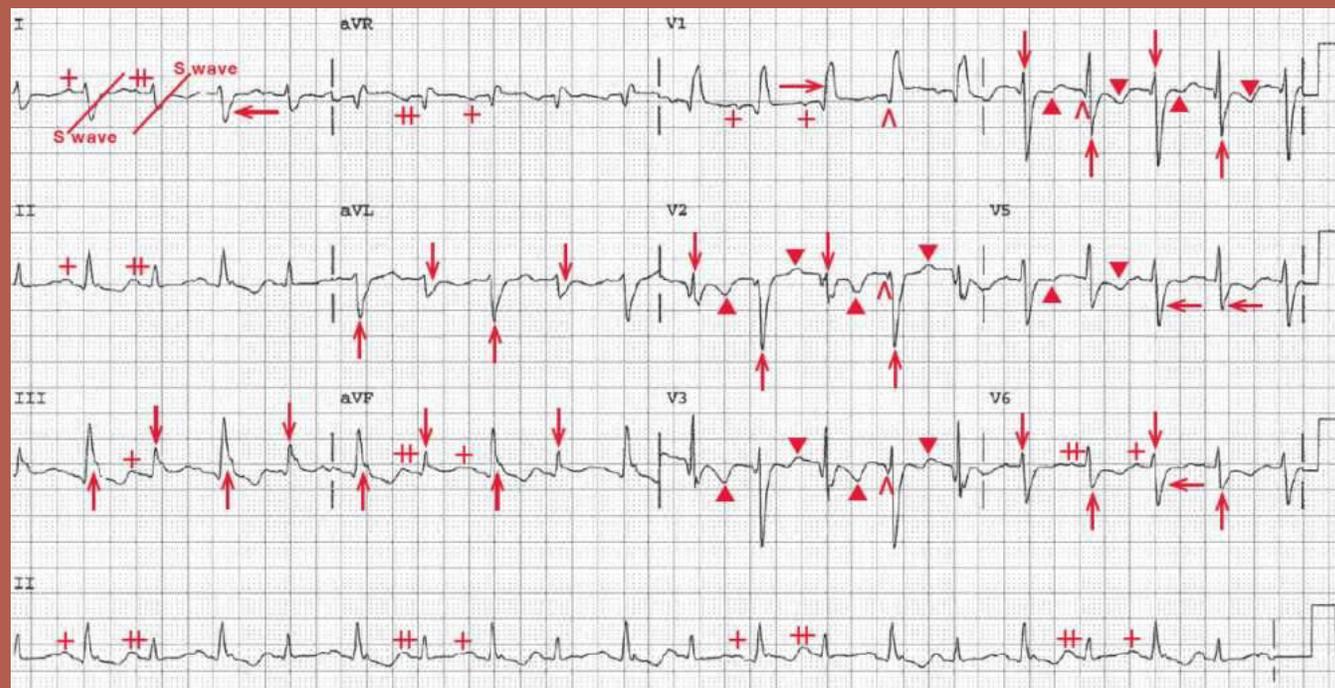


1. Echocardiogram

- Imaging procedure of choice: Confirms the presence or absence of a significant effusion
- Most sensitive and specific method of determining whether pericardial fluid is present; can show as little as 20 mL of fluid
- Should be performed in all patients with acute pericarditis to rule out an effusion

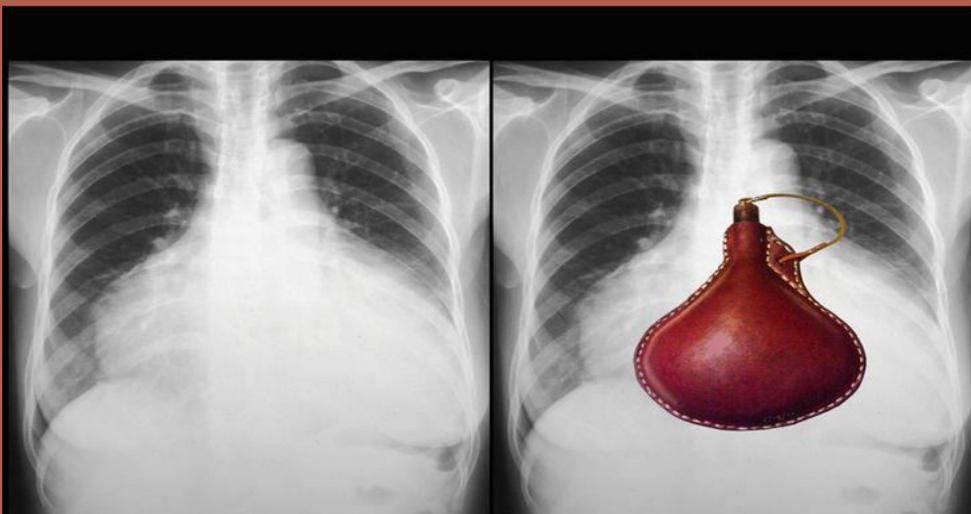
2.ECG

- Normal in smaller effusions
- May show low QRS voltages and T-wave flattening but should not be used to diagnose pericardial effusion
- Electrical alternans**
suggests a massive pericardial effusion and tamponade



3-CXR

- CXR shows enlargement of cardiac silhouette when >250 mL of fluid has accumulated
- Cardiac silhouette may have prototypical “**water bottle**” appearance

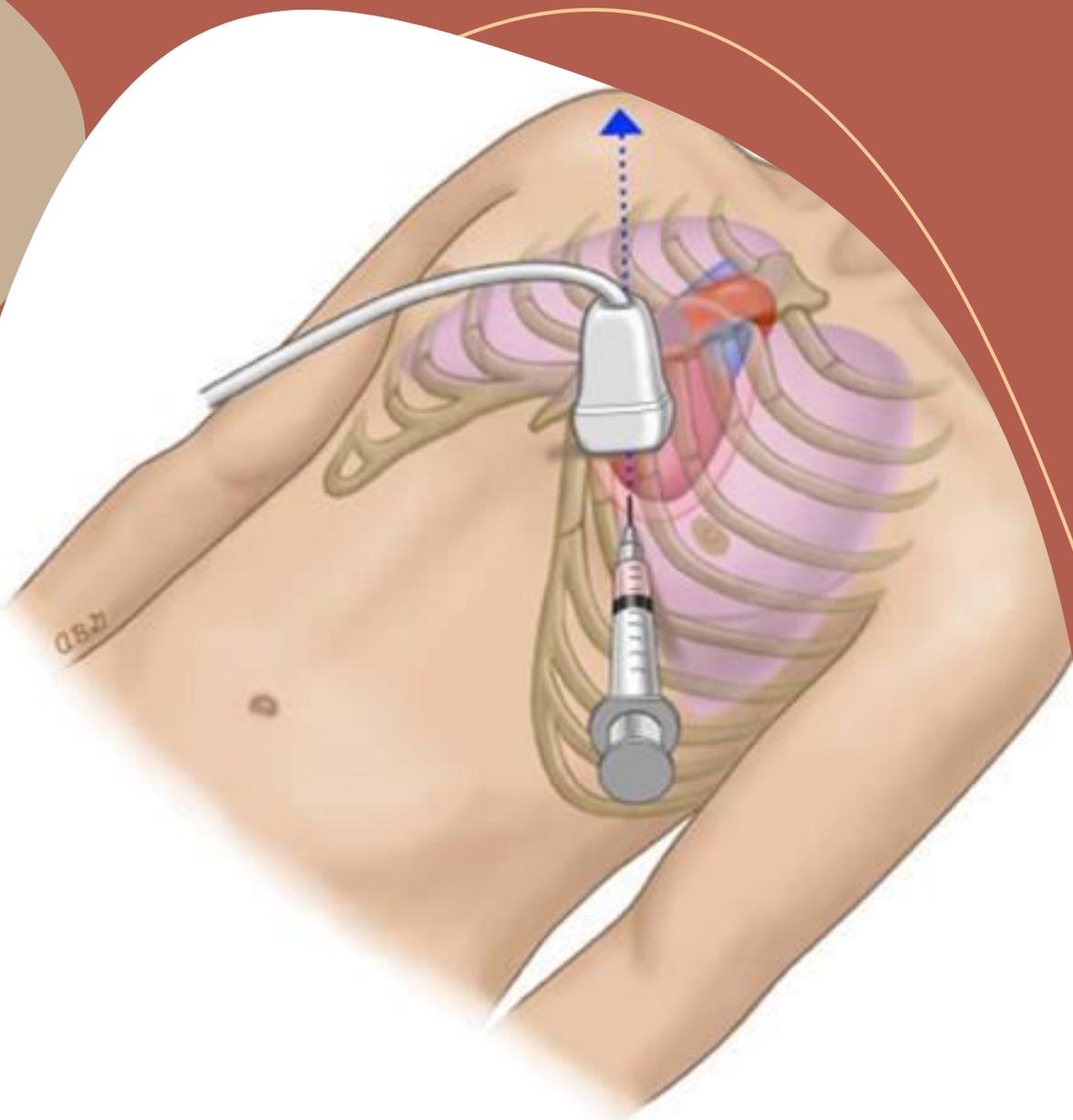


4-Pericardial fluid analysis

via diagnostic pericardiocentesis

Order **protein** and **glucose content**, **cell count** and differential, cytology, specific gravity, hematocrit, Gram stain, acid-fast stains, mycobacterial PCR, fungal smear, cultures, **LDH content**

It done To relieve the symptoms and for diagnosis
If it's color as urine it will be Transudate
If it's color cloudy it will be Exudate



Treatment :

Small pericardial effusion:

Conservative management focusing on treating the underlying cause is usually sufficient , repeat echocardiogram in 1 to 2 weeks is appropriate.

Large pericardial effusion

causing symptoms or of uncertain etiology:
Consider pericardial fluid drainage

Provide supportive care, e.g., pain management

4-cardiac tamponade:

Defined as accumulation of pericardial fluid. It is the **rate of fluid accumulation that is important, not the amount.**

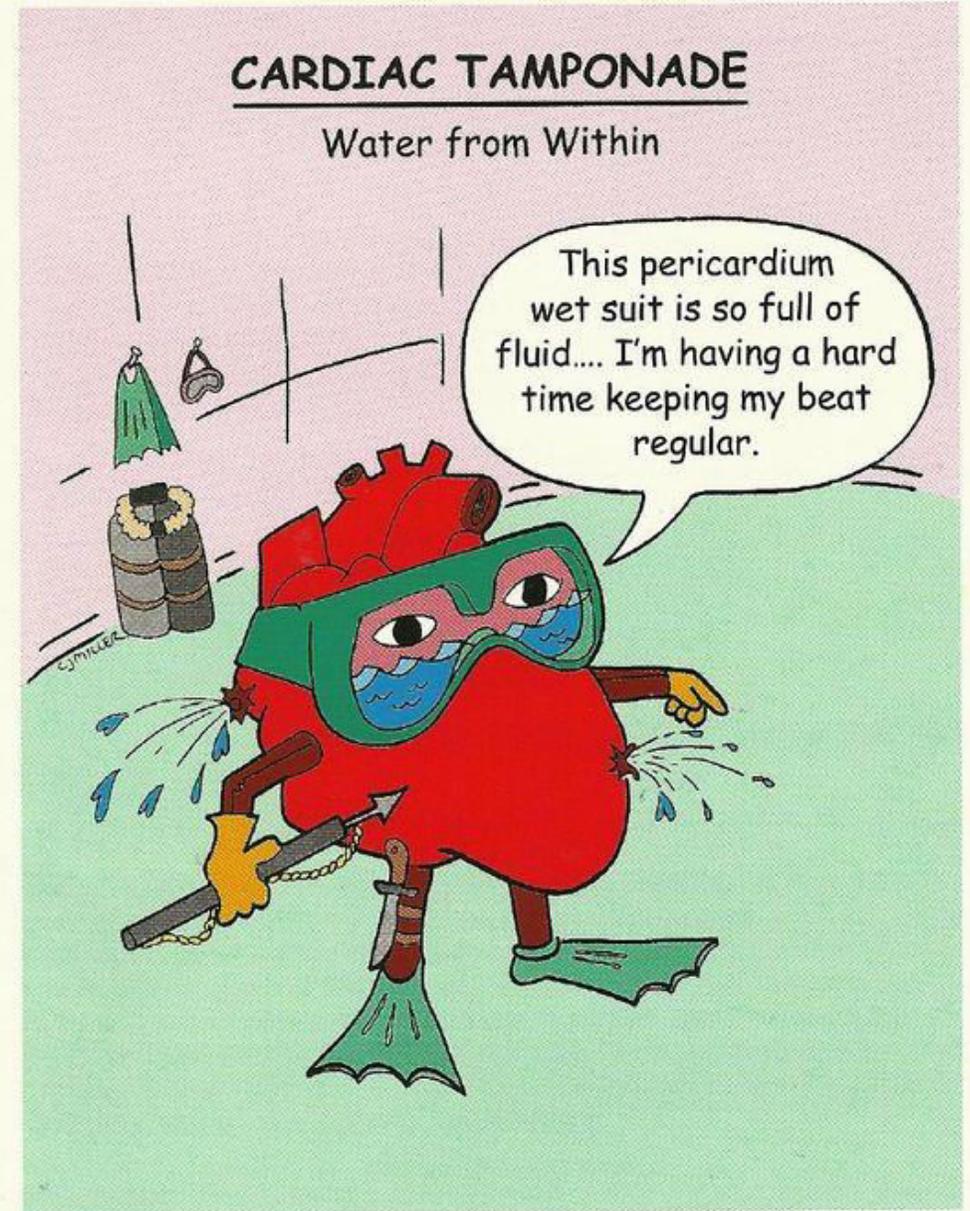
Note:

- a. Two hundred milliliters of fluid that develops rapidly (i.e., blood secondary to trauma) can cause cardiac tamponade.
- b. Two liters of fluid may accumulate slowly before cardiac tamponade occurs. When fluid accumulates slowly, the pericardium has the opportunity to stretch and adapt to the increased volume (i.e., related to a malignancy).



Causes

1. Penetrating (less commonly blunt) trauma to the thorax, such as gunshot and stab wounds
2. Iatrogenic: Central-line placement, pacemaker insertion, pericardiocentesis, etc.
3. Pericarditis, progressive pericardial effusion
4. Post-MI with free wall rupture
5. Aortic dissection

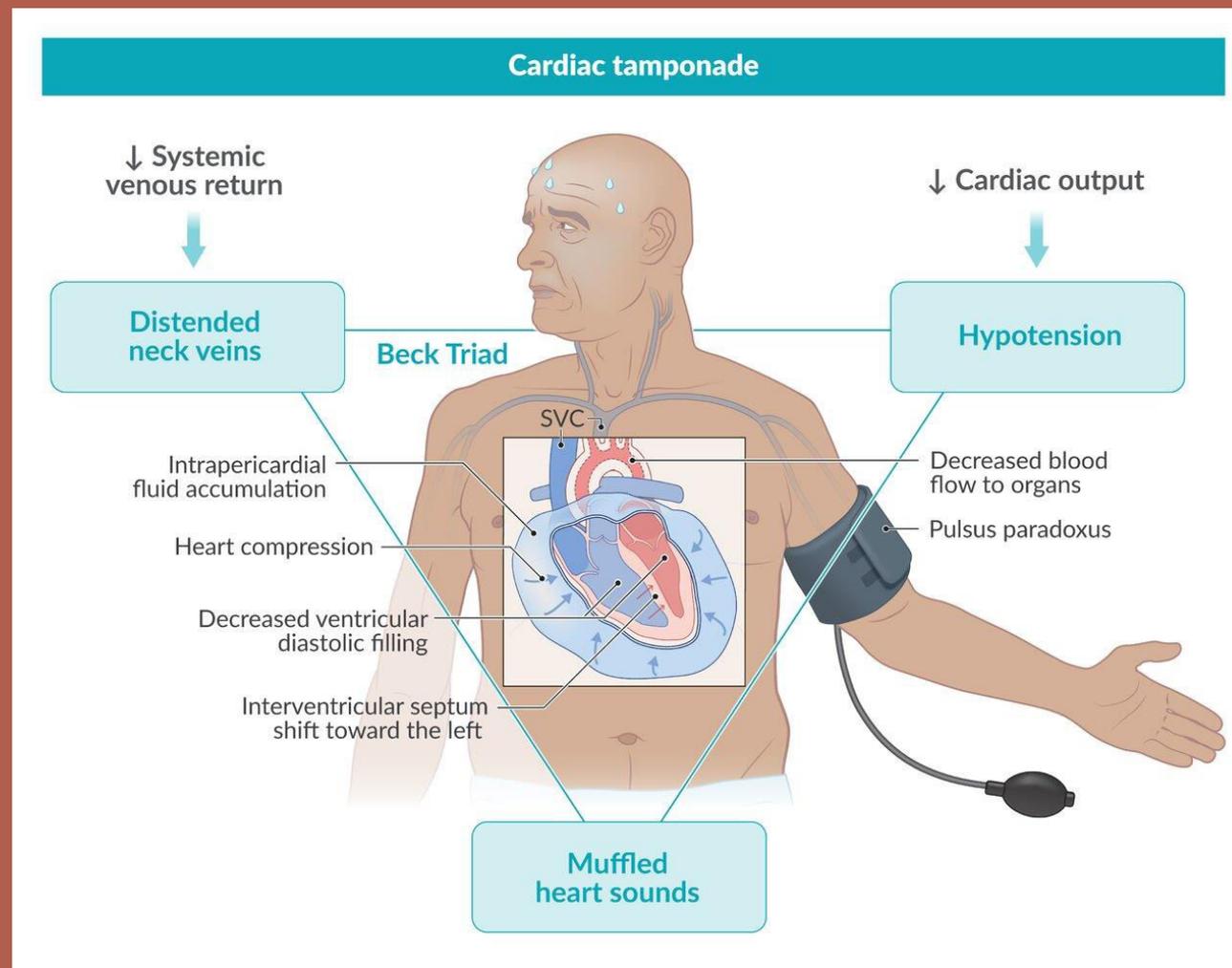


Pathophysiology

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 → ↓ systemic venous return (preload) → ↓ ventricular diastolic filling → ↓ stroke volume (and venous congestion) → ↓ cardiac output and equal end-diastolic pressures in all 4 chamber

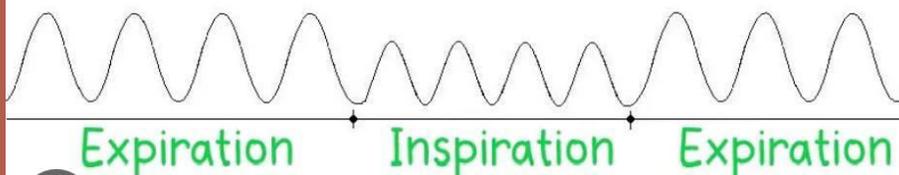
Clinical features :

1. **Beck triad**: Hypotension, muffled heart sounds, elevated JVP
2. Pulsus paradoxus
3. Pallor, cold sweats
4. Left ventricular failure
5. Symptoms of right heart failure
6. Obstructive shock, cardiac arrest



Pulsus Paradoxus

Perfusion pressure



Diagnosis

1. Echocardiogram

a. Chamber collapse

- Early signs: collapse of the right atrium during systole, collapse of the right ventricle during early diastole

- Later: collapse of the left atrium

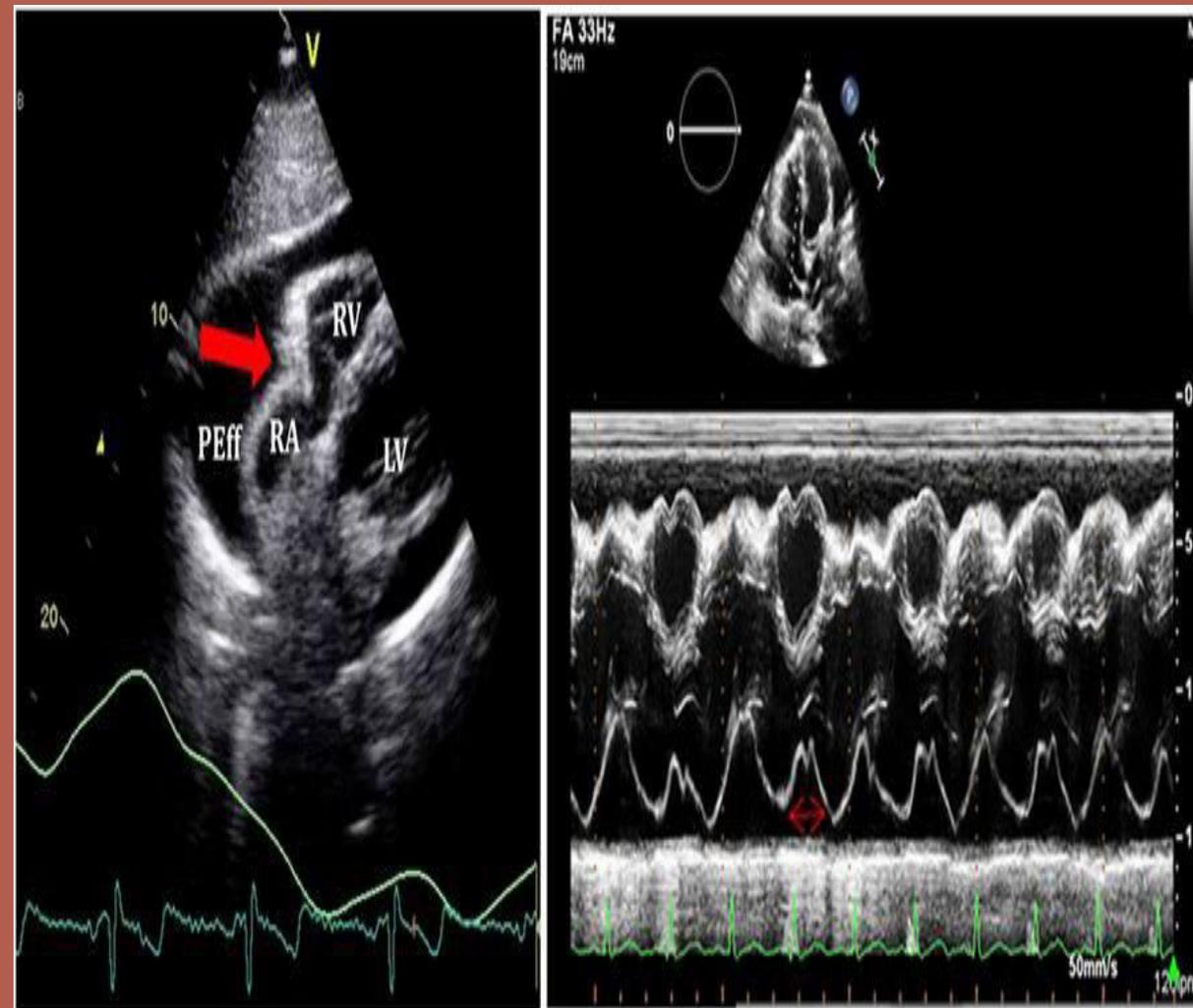
b. Swinging motion of the heart

2. ECG : o Sinus tachycardia o Low voltage QRS

complexes o Electrical alternans o Pulseless electrical activity (PEA) in cardiac arrest

Findings are neither 100% sensitive nor specific. ECG should not be used to

diagnose tamponade

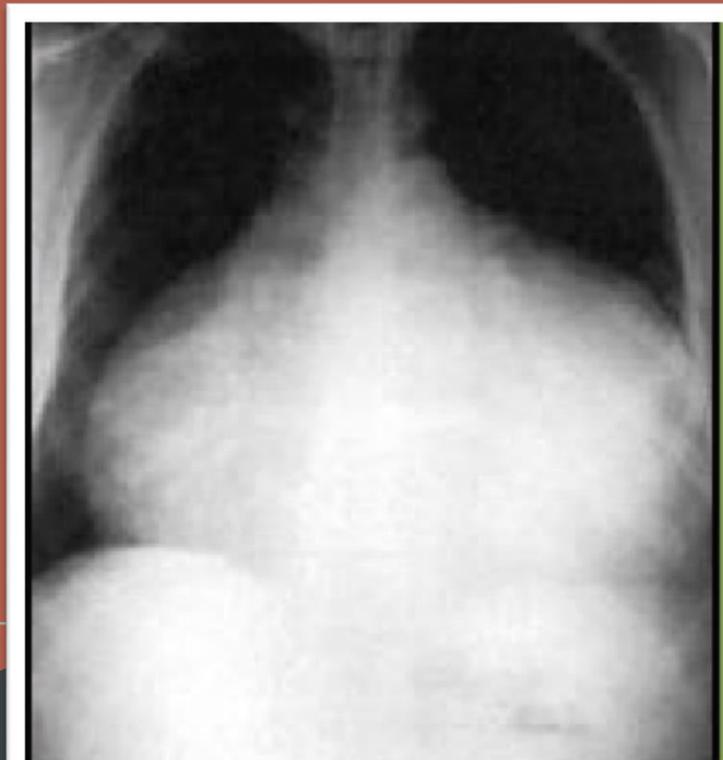


3. CXR

- a. Enlargement of cardiac silhouette when >250 mL has accumulated
- b. Clear lung fields

4. Cardiac catheterization.

- a. Shows equalization of pressures in all chambers of the heart
- b. Shows elevated right atrial pressure with loss of the y descent



Treatment

Nonhemorrhagic tamponade

- a. If patient is hemodynamically stable

Monitor closely with echocardiogram, CXR, ECG If patient has known renal failure, dialysis is more helpful than pericardiocentesis

- b. If patient is not hemodynamically stable

Pericardiocentesis is indicated If no improvement is noted, fluid challenge may improve symptoms

Hemorrhagic tamponade secondary to trauma

- If the bleeding is unlikely to stop on its own, emergent surgery is indicated to repair the injury and it is contraindication of aspiration
- b. Pericardiocentesis is only a temporizing measure and is not definitive treatment.

Surgery should not be delayed to perform pericardiocentesis

**DOCTOR
IN PROGRESS**



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Thank You!

Refranceceses:
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Ambosis

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غزه وأهلها، اللهم
أنصرهم وثبت
أقدامهم، اللهم كن
لهم ناصراً ومعيناً.

