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Acute Pericarditis

PATHOGENESIS

Inflammation of the pericardium may have only minor pathophysiologic consequences **in the absence of significant fluid** accumulation in the pericardial space.

When the **amount of fluid in the nondistensible pericardial space becomes excessive**, pressure within the pericardium increases and is transmitted to the heart resulting in impaired filling.

Although **small to moderate amounts** of pericardial effusion can be well tolerated and clinically silent, once the noncompliant pericardium has been distended maximally, any further fluid accumulation causes abrupt impairment of cardiac filling and is termed **cardiac tamponade**.

As normal we have 10 to 15cc

Durin massive effusion or tamponad reach to 1000cc

When untreated, tamponade can lead to shock and death.

Pericardial effusions may be serous/transudative, exudative/purulent, fibrinous, or hemorrhagic.

Etiology of Pericardial Disease

CONGENITAL

Cysts

INFECTIOUS

NONINFECTIOUS

INFECTIOUS

Viral

Bacterial

Immune complex (meningococcus, *H. influenzae*)

Fungal (actinomycosis, histoplasmosis)

Parasitic (toxoplasmosis, echinococcosis)

NONINFECTIOUS

- **Idiopathic**
- **Systemic inflammatory diseases** (ARF, JRA, SLE, mixed connective tissue disorders, systemic sclerosis, KD, ..
- **Metabolic** (uremia, hypothyroidism, Gaucher disease, very-long chain acyl-CoA dehydrogenase deficiency)
- **Traumatic** (surgical, catheter, blunt)
- Malignancy

Infectious Pericarditis

- **purulent pericarditis**
- **Viral pericarditis**

A number of **viral agents** are known to cause pericarditis, and the clinical course of the majority of these infections is mild and spontaneously resolving.

The term acute benign pericarditis is **synonymous** for viral pericarditis.

Agents identified as causing pericarditis include the **enteroviruses, influenza, adenovirus, respiratory syncytial virus, and parvovirus.**

As the course of this illness is usually benign, **symptomatic treatment** with **nonsteroidal antiinflammatory agents** is often sufficient.

Patients with **large effusions and tamponade** may require pericardiocentesis.

Echocardiography is useful in differentiating *pericarditis* from *myocarditis*, the latter of which will show evidence of diminished myocardial contractility or valvular dysfunction.

Pericarditis and **myocarditis** may occur together in some cases of viral infection.

Purulent pericarditis, often caused by bacterial infections, has become much less common with the advent of new **immunizations** for **haemophilus** and **pneumococcal** disease.

Historically, purulent pericarditis was seen in association with severe **pneumonias**, **epiglottitis**, **meningitis**, or **osteomyelitis**.

Patients with **purulent pericarditis** are acutely ill. Unless the infection is recognized and treated expeditiously, the course can be fulminant, leading to tamponade and death.

Noninfectious Pericarditis

Systemic inflammatory diseases including autoimmune, rheumatologic, and connective tissue disorders may involve the pericardium and result in serous pericardial effusions.

Pericardial inflammation may be a component of the **type II hypersensitivity** reaction seen in patients with ***acute rheumatic fever***. It is often associated with rheumatic valvulitis and responds quickly to antiinflammatory agents including steroids. Tamponade is very uncommon.

Juvenile idiopathic arthritis, usually systemic onset disease, can manifest with pericarditis.

Aspirin and/or corticosteroids can result in rapid resolution of a pericardial effusion but may be needed on a chronic basis to prevent relapse.

Patients with **chronic renal failure** or **hypothyroidism** may have pericardial effusions and should be carefully screened with physical exam, and, if indicated, imaging studies, during the course of their illness should clinical suspicion arise.

CLINICAL MANIFESTATIONS

The **most common symptom** of acute pericarditis is **chest pain**, typically described as sharp/stabbing, positional, radiating, worse with inspiration, and relieved by sitting upright or prone.

Cough, fever, dyspnea, abdominal pain, and vomiting are **nonspecific symptoms** associated with pericarditis.

Additionally, signs and symptoms of **organ system involvement** may occur in the presence of generalized systemic disease.

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Muffled or distant heart sounds, tachycardia, narrow pulse pressure, jugular venous distention, and a pericardial friction rub provide **clues to the diagnosis** of acute pericarditis.

Cardiac tamponade is recognized by the excessive fall of systolic blood pressure (>10 mm Hg) with inspiration.

This **pulsus paradoxus** can be assessed by **careful auscultatory blood pressure determination** (automated blood pressure cuffs are inadequate), **arterial pressure line wave form**, or **pulse oximeter tracing inspection**.

Conditions other than cardiac tamponade, which may result in pulsus paradoxus include **severe dyspnea**, **obesity**, and **positive pressure ventilator support, COPD**

DIFFERENTIAL DIAGNOSIS

Chest pain similar to that present in pericarditis can occur with **lung diseases**, especially pleuritis, and with **gastroesophageal reflux**.

Pain related to **myocardial ischemia** is usually more severe, more prolonged, and occurs with exercise, allowing distinction from pericarditis induced pain.

The presence of a pericardial effusion by echocardiography is virtually diagnostic of pericarditis.

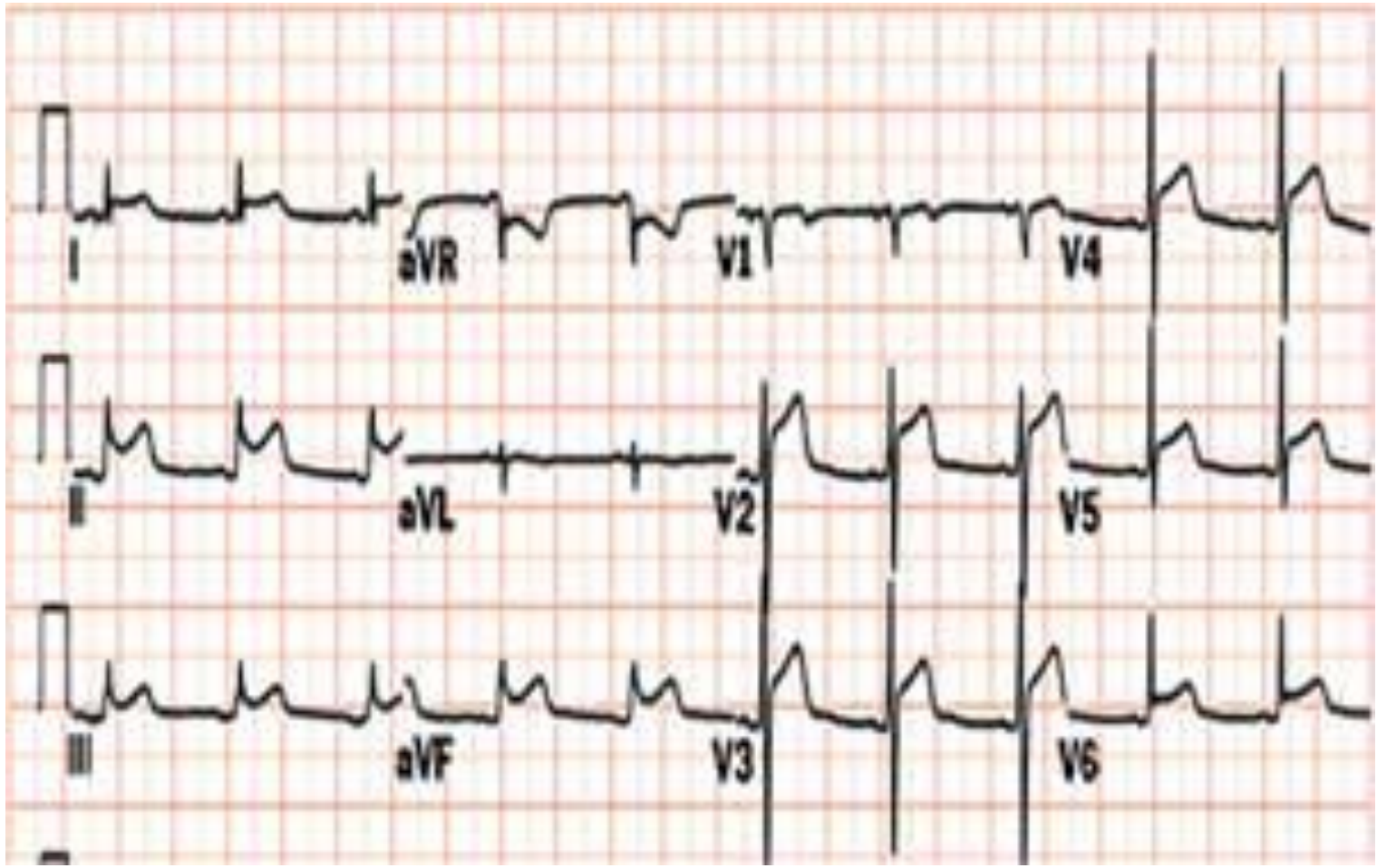
DIAGNOSIS

The **electrocardiogram** is often abnormal in acute pericarditis although the findings are nonspecific.

Low voltage QRS amplitude may be seen as a result of pericardial fluid accumulation.

Tachycardia

abnormalities of the ST segments, PR segments, and T waves may be present as well.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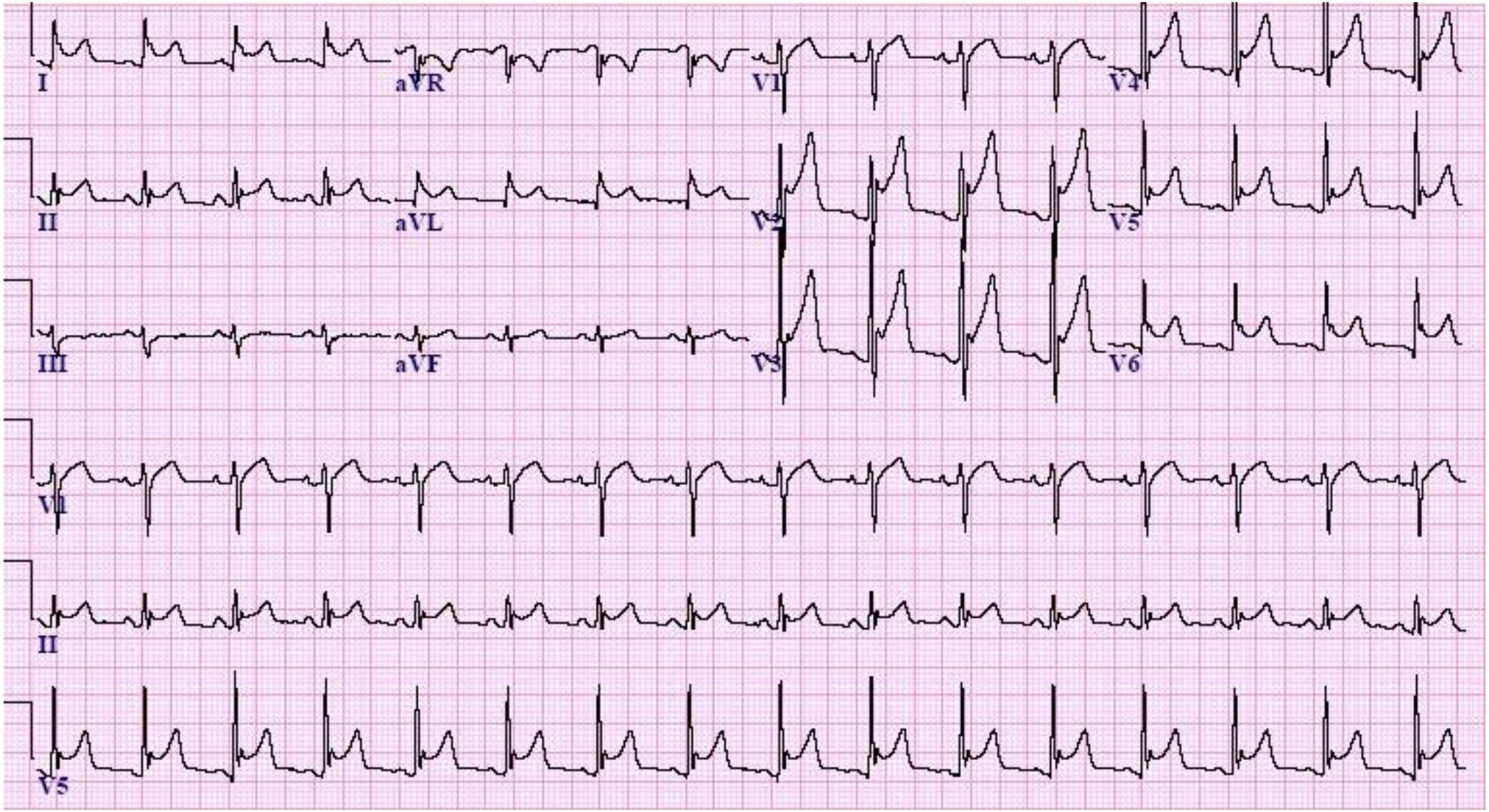
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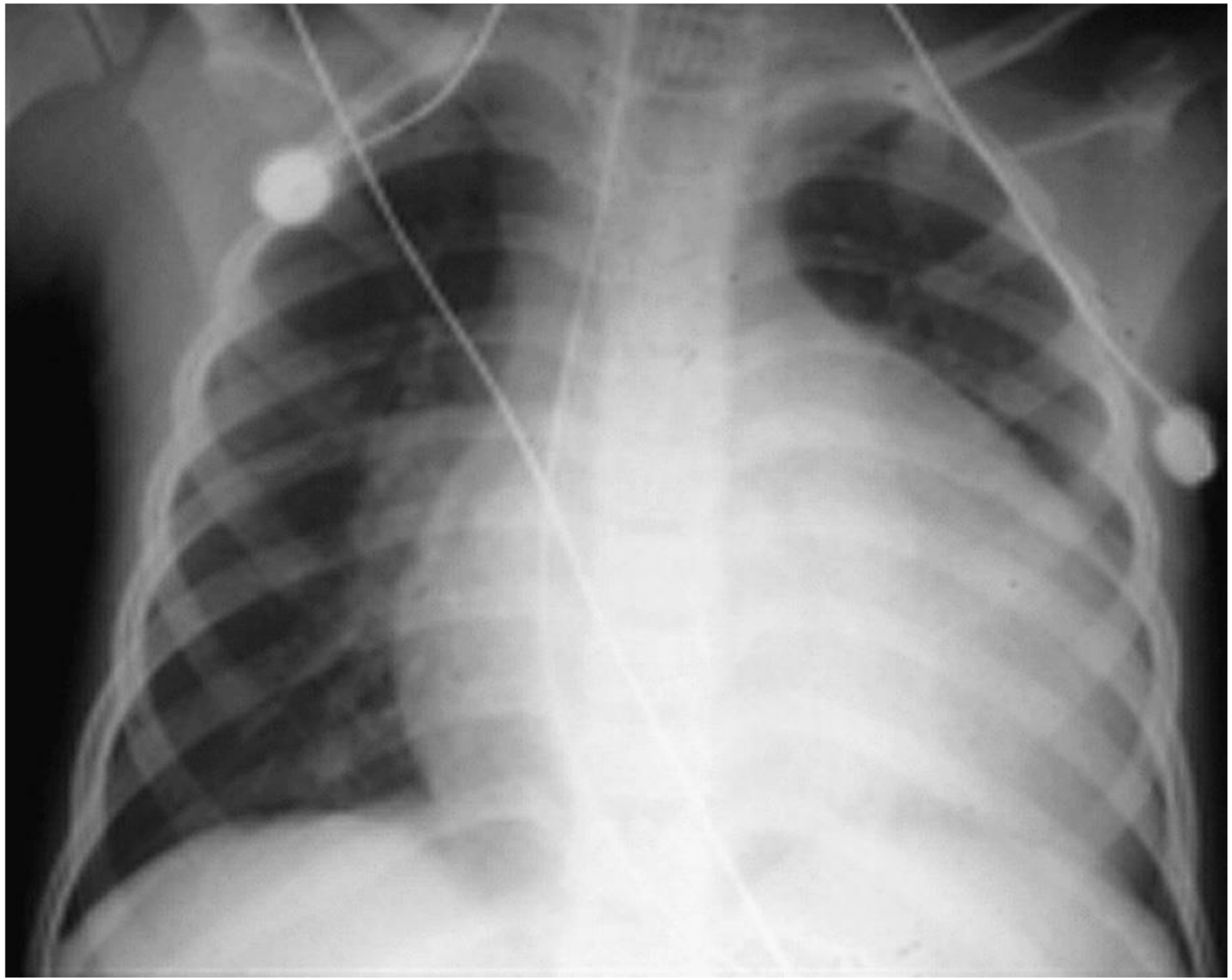
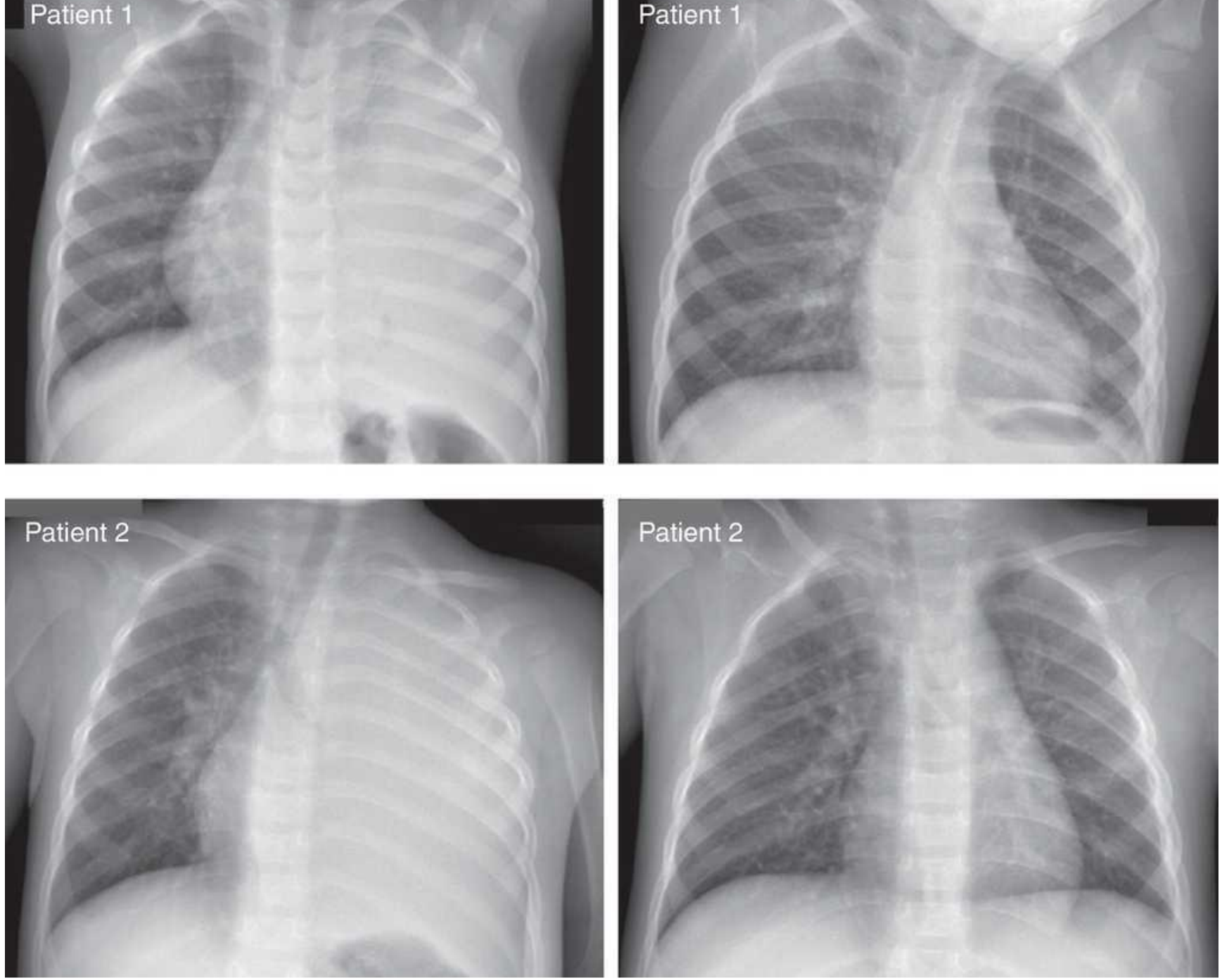
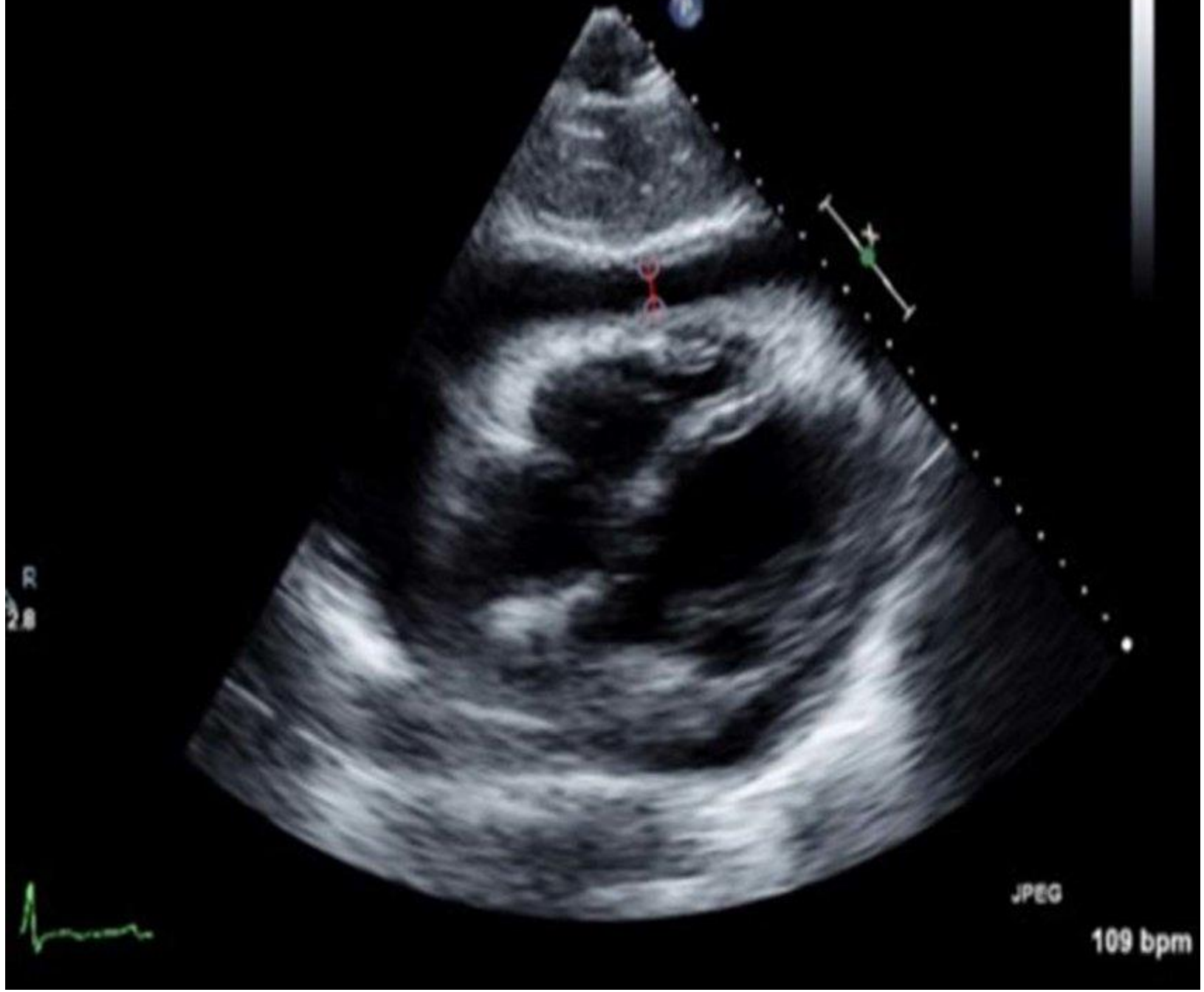
Although **the chest x-ray** findings in a patient with pericarditis without effusion are usually normal, in the presence of a significant effusion, cardiac enlargement will be seen and cardiac contour may be unusual (**Erlenmeyer flask** or **water bottle** appearance) .

Water bottle silhouette. This chest radiograph shows marked cardiomegaly, also known as a water bottle silhouette, which
is seen in the presence of large pericardial effusions. Also note the
associated pulmonary edema from associated high left atrial and left
ventricular filling pressures.




Patient 1
Patient 1
Patient 2
Patient 2

Echocardiography is the most sensitive technique for identifying the size and location of a pericardial effusion.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Thank you for listening