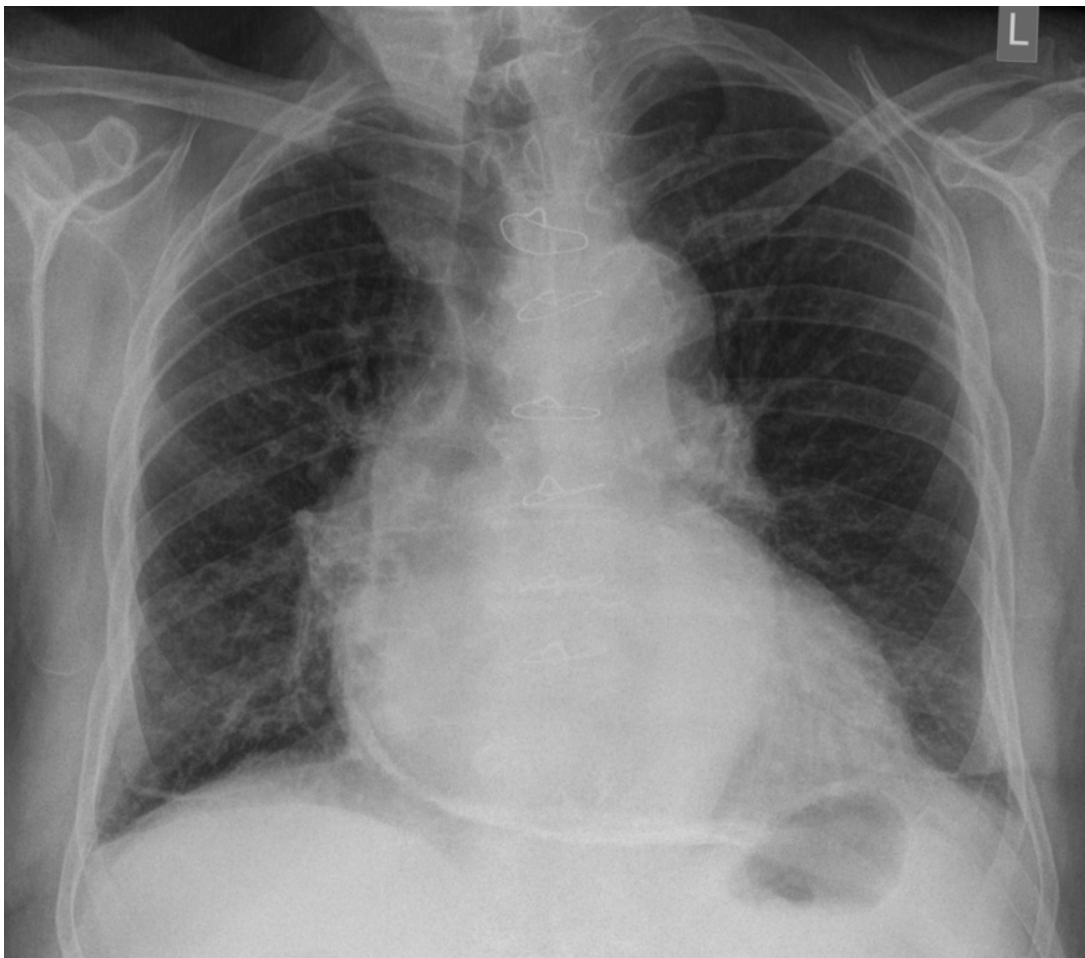


## Constrictive Pericarditis — Symptoms and ECG

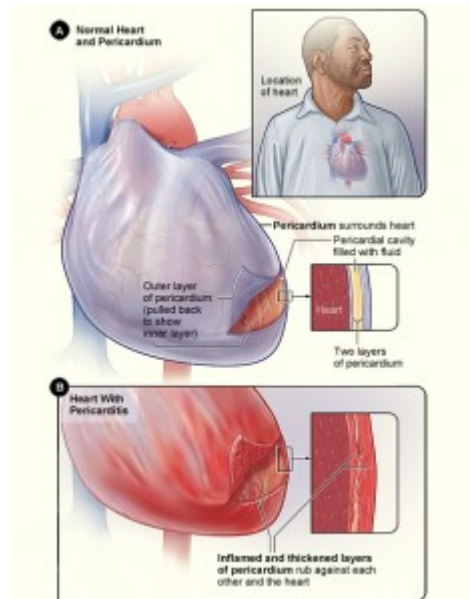
[See online here](#)

**Constrictive pericarditis is characterized by a thickened and scarred pericardial sac that lays around the heart and prevents proper diastolic filling. Diagnosis is very difficult because this condition mimics many other diseases.**



For further details on "[Acute Pericarditis](#)", please see our separate article on that subject.

### Definition of Constrictive Pericarditis



**Image:** “Figure A shows the location of the heart and a normal heart and pericardium (the sac surrounding the heart). The inset image is an enlarged cross-section of the pericardium that shows its two layers of tissue and the fluid between the layers. Figure B shows the heart with pericarditis. The inset image is an enlarged cross-section that shows the inflamed and thickened layers of the pericardium.” by National Heart Lung and Blood Institute (NIH). License: Public Domain

Constrictive pericarditis limits the heart’s ability to function normally due to a **thickened and scarred pericardial sac that lays around the heart**. This prevents proper diastolic filling.

## Epidemiology of Constrictive Pericarditis

### Spread of constrictive pericarditis

Constrictive pericarditis is much less common compared to acute pericarditis.

**Approximately 10 % of acute pericarditis progress to constrictive pericarditis.**

Middle age males are the most predominant group.

## Etiology of Constrictive Pericarditis

### Causes of constrictive pericarditis

In the past, constrictive pericarditis was associated with bacterial pericarditis and purulent pericarditis. In the developed world this is a rare finding. Constrictive pericarditis is often **iatrogenic** following open-heart surgery or radiation therapy for the treatment of **mastocarcinoma** and other cancers. Radiation-induced constrictive pericarditis usually presents 10 years after therapy. In the developing world **tuberculosis** is a common cause of constrictive pericarditis.

# Pathology and Pathophysiology of Constrictive Pericarditis

Inflammation of the pericardial sac results in the **release of fibrin** and the **formation of effusion**. If this results in an organization the parietal and visceral linings will become thickened and fuse. This sclerotic pericardium cannot expand and will prevent the heart from filling during diastole, resulting in **right-sided heart failure**.

## Symptoms of Constrictive Pericarditis

### Signs of constrictive pericarditis

Constrictive Pericarditis results in right-sided heart failure. Symptoms include:

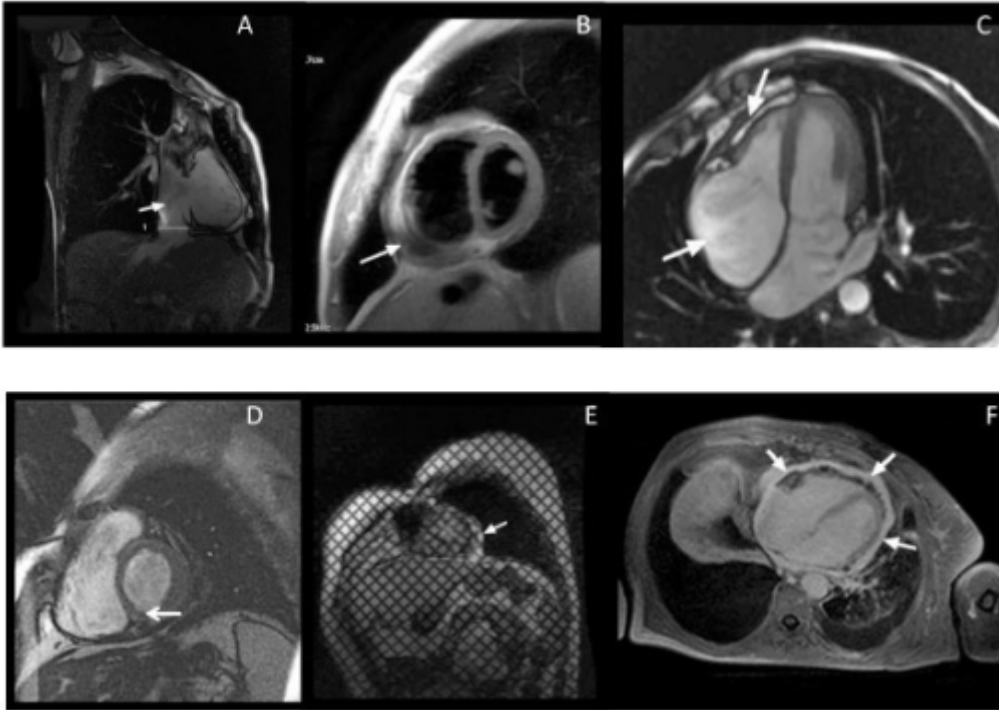
- **Dyspnea**
- Edema of the extremities
- **Swollen abdomen:** hepatomegaly, ascites
- **Hepatic congestion:** right upper quadrant pain of the abdomen
- Other symptoms include: fatigue, chest pain, palpitations

On physical exam, a pericardial knock may be heard at the left sternal border in early diastole. Hepatomegaly and hepatic pulsations are also findings of constrictive pericarditis.

## Diagnosis of Constrictive Pericarditis

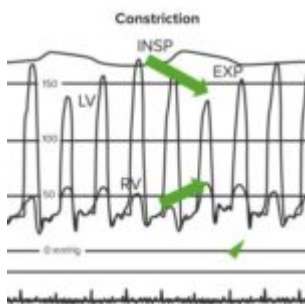
**ECG findings** are usually **nonspecific** and include a low voltage QRS complex in all leads and T wave inversions. **Kussmaul's sign**, a rise in jugular venous pressure with inspiration (normally it should drop with inspiration) is a nonspecific finding and is found in restrictive pericarditis, restrictive [cardiomyopathy](#), and tricuspid stenosis.

**Echocardiography is the preferred method** to diagnose constrictive pericarditis. Abnormalities of chamber filling and pericardial distortions will be visible. **Chest X-ray** may show pericardial calcification or [pleural effusions](#).

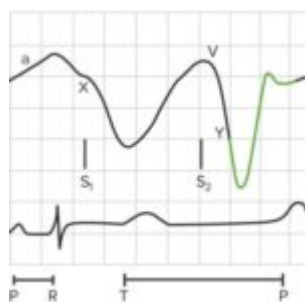


**Image:** "MR appearances of constrictive pericarditis. A: Right ventricular vertical long-axis image showing circumferential pericardial thickening, enlarged inferior vena cava; B: short axis image showing circumferential pericardial thickening, encysted pericardial effusion. C: four chamber image showing focal pericardial thickening in front of the right ventricle lateral wall, encysted pericardial effusion, enlarged right atrium; D: short axis image showing focal pericardial thickening in front of the left ventricular inferior and lateral wall. E: short axis tagging image showing focal pericardial thickening and adherence in front of the left ventricular lateral wall. F: four chamber late gadolinium enhancement image showing enhancing pericardium." by openi. License: Public Domain [CC BY 2.0](https://creativecommons.org/licenses/by/2.0/)

**Cardiac catheterization** can identify abnormal cardiac filling pressure, another sign of constrictive pericarditis. It is invasive and not a first-line diagnostic procedure. Classically the diastolic waveform has a shape of square root sign.



"Square Root Sign II"  
Image created by  
Lecturio



"Square Root Sign"  
Image created by  
Lecturio

## Differential Diagnoses of Constrictive Pericarditis

- [Acute pericarditis](#)
- Atrial myxoma

- [Cardiac tamponade](#)
- Cirrhosis of the liver
- Dilated cardiomyopathy
- [Myocardial infarction](#)
- [Pericardial effusion](#)
- [Restrictive cardiomyopathy](#)
- Uremia

**Note:** It is difficult to distinguish constrictive pericarditis and restrictive cardiomyopathy.

## Therapy of Constrictive Pericarditis

### Treatment of constrictive pericarditis

Medical management is usually ineffective. However, [diuretics](#) are helpful early in the disease. Definitive treatment is **pericardiectomy or pericardial stripping**. This procedure has a significant risk associated with it. In pericardiectomy, some or most of the pericardium is **surgically removed**.

## Progression and Prognosis of Constrictive Pericarditis

The best strategy in treating constrictive pericarditis is to recognize it and **start treatment as early as possible**. Constrictive pericarditis responds poorly to medical intervention, while **surgical treatment is definitive but risky**. Long-term prognosis depends on etiology. Idiopathic constrictive pericarditis has the best prognosis, followed by post-surgery constriction. Post radiation constriction has the worst prognosis.

## Review Questions

The solutions are located below the sources.

### 1. Which of the following is not a symptom of constrictive pericarditis?

- A. Extremity edema
- B. Fatigue
- C. Hepatomegaly
- D. Chest pain

### 2. Kussmaul's sign is caused by which condition?

- A. Constrictive pericarditis
- B. Tricuspid stenosis
- C. Restrictive cardiomyopathy
- D. All of the above

## References

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Yeh E.H., Bickford C.L., Ewer M.S. (2011). Chapter 90. The Diagnosis and Management of Cardiovascular Disease in Patients with Cancer. In Fuster V, Walsh R.A., Harrington R.A. (Eds), Hurst's The Heart, 13e.

**Correct answers:** 1D, 2D

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Notes