

## Not All Chest Pain is Created Equal



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Table 1

### Differential Diagnosis of Chest Pain

<b><u>Chest wall:</u></b>	Costochondritis Rheumatic joint disease Herpes Zoster
<b><u>Cardiac:</u></b>	Acute myocardial ischemia (Infarction) Aortic dissection Pericarditis
<b><u>Pulmonary:</u></b>	Acute pulmonary thromboembolism Pneumonia Pneumothorax
<b><u>Gastrointestinal:</u></b>	Gastroesophageal reflux disease Esophagitis Esophageal spasm

A 47-year-old man with essential hypertension and diet-controlled diabetes mellitus presents with chest pain of two days duration. His current medication regimen includes low-dose acetylsalicylic acid (ASA) as well as a combination of an angiotensin converting enzyme (ACE) inhibitor and hydrochlorothiazide. He works as an office clerk and smokes five to 10 cigarettes a day.

## What differential diagnoses should be entertained?

On further questioning, the chest pain is described as sharp and worse with inspiration, not related to exertion and much worse with recumbency. The patient has not traveled recently, nor sustained any trauma to his thorax or his lower extremities.

On examination, he appears well, but looks mildly uncomfortable due to his chest pain. His blood pressure is 130/80 mmHg in both arms and he is not tachycardic. The cardiac exam is remarkable only for a scratching sound heard in the left lower sternal border through systole and diastole. The rest of the examination is within normal limits.

You are able to obtain a chest X-ray (CXR), which is normal. A 12-lead ECG demonstrates widespread ST segment elevation (Table 2).

Table 2

### Common causes of ST segment elevation

1. Acute myocardial infarction
2. Acute pericarditis
3. Early repolarization variant of normal
4. Post-myocardial infarction ventricular aneurysm formation



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# WHAT'S YOUR DIAGNOSIS?

Table 3

## Differentiating myocardial infarction from pericarditis

	<u>Acute Myocardial Infarction</u>	<u>Acute Pericarditis</u>
Distribution of ST elevation	Localized to territory	Widespread
PR segment depression	Absent	Frequently present
Q waves	Often present	Absent
T wave inversion	Along with ST elevation	After ST segment resolution
Contour of ST segment	Convex down "frowning"	Concave up "smiling"

Marinella MA: Electrocardiographic manifestations and differential diagnosis of acute pericarditis. *American Family Physician*. 1998; 57(4):699-704.

## What is your differential diagnosis?

Given the presence of pleuritic chest pain, a biphasic pericardial friction rub and an ECG pattern consistent with the diagnosis, you accurately diagnose acute pericarditis (Table 3).

## Acute Pericarditis

Acute pericarditis is an acute inflammation of the pericardial sac culminating in the syndrome of acute pleuritic chest pain, pericardial friction rub and widespread ST elevation on the ECG.<sup>1</sup> Up to 80% of the cases of acute pericarditis are idiopathic or related to a viral infection. Other common etiologies are listed in Table 4.

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Table 4

## Major causes of acute pericarditis

1. Idiopathic
2. Infectious (viral, bacterial, TB and rickettsia)
3. Radiation
4. Neoplastic
5. Post-Myocardial infarction
6. Autoimmune
7. Drug-induced (procainamide, isoniazid or hydralazine)

Oakley CM: Myocarditis, pericarditis and other pericardial diseases. *Heart*. 2000; 84(4):449-54.

The chest pain in acute pericarditis is often of acute onset, pleuritic in nature and improves with leaning forward. The pericardial friction rub, present in 85% of patients with acute pericarditis, is a high-pitched scratchy or squeaky sound best heard at the lower left sternal border and can be tri-phasic occurring during ventricular systole and diastole as well as with the atrial contraction. The ECG changes seen reflect inflammation of the epicardium as the pericardium is itself electrically inert. Classically, four

electrocardiographic stages are described in acute pericarditis. The first (the one associated with acute symptomatology) demonstrates widespread concave upward ST segment elevation with diffuse PR segment depression (elevation in aVR).<sup>2</sup>

Laboratory tests are often non-specific, however, troponin elevation may be seen in up to 50% of patients and may reflect a small amount of myocardial inflammation.

Echocardiography is not routinely recommended unless a high index of suspicion exists for a large pericardial effusion suspected on CXR, purulent pericarditis, cardiac tamponade or metastatic disease.

Therapy for acute pericarditis should be initiated with the goals of reducing pain as well as the pericardial inflammation. Many regimens can be instituted, but most hinge on nonsteroidal anti-inflammatory drugs (NSAIDs). ASA can be given in doses of two to six g a day, but most physicians recommend a seven to 10 day course of potent agents, such as indomethacin or ibuprofen. A follow-up within one week of initiation of treatment is recommended and failure to improve may warrant evaluation by a specialist, as well as echocardiography.

## Case Continued

On further questioning, your patient admits to having had the “flu” recently with resolution of his symptoms three days ago. You strongly suspect a viral etiology for his pericarditis. A chest X-ray obtained in a radiology clinic is essentially normal. You elect to treat him with indomethacin for 10 days and he returns to your office for follow-up, reporting complete resolution of his symptoms. You can no longer detect a friction rub, but will continue following him for his hypertension. **Dx**

### References

1. Oakley CM: Myocarditis, pericarditis and other pericardial diseases. *Heart* 2000; 84(4):449-54.
2. Marinella MA: Electrocardiographic manifestations and differential diagnosis of acute pericarditis. *American Family Physician* 1998; 57(4):699-704.