Central sharp chest pain: what is the diagnosis?

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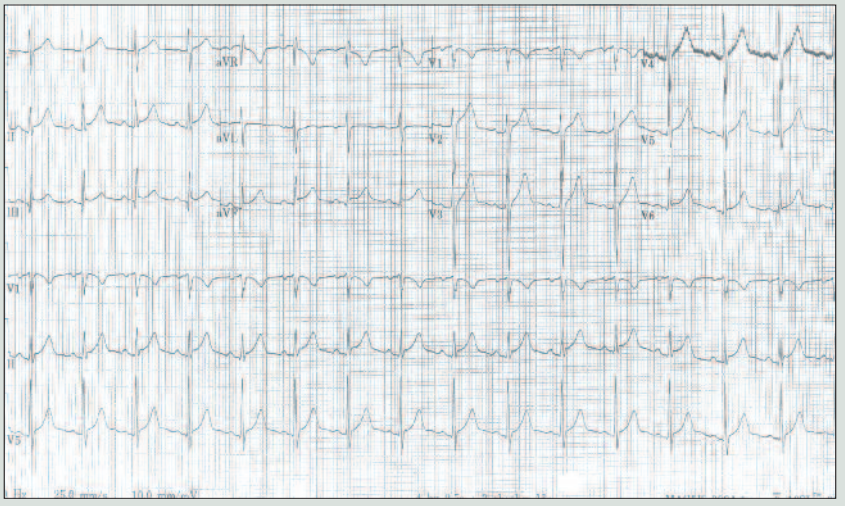
A 60-year-old lady who has had a bad night with central sharp chest pain that goes into her neck arrives at your practice on a Monday morning at 8.30 am. You see her immediately.

She tells you that she has had the pain for 16 hours now. It is worse on inspiration, better leaning forward and she does not appear short of breath. She thinks she has recently had the 'flu' and still has a mild, residual dry cough. She doesn't want to go to Accident and Emergency because she never gets a bed and she can't take her dog with her.

After taking a further history and examining her, you do not think the chest pain is likely to be ischaemic because of its nature and duration. You perform an ECG (see above).



ECG COURTESY OF DR MARTIN DUFFY, DIRECTOR OF EMERGENCY MEDICINE TRAINING AT ST VINCENT'S HOSPITAL AND CONJOINT SENIOR LECTURER AT UNIVERSITY OF NSW, SYDNEY, NSW.

Q1. On the basis of the history and ECG, what do you think is the most likely diagnosis?

Pericarditis is the most likely diagnosis. Pleuritis without pericarditis is a differential diagnosis, but does not have the ECG changes shown. Acute myocardial ischaemia does not show the 'scooped-out' or concave, generalised ST elevation (due to abnormal repolarisation secondary to pericardial inflammation), although this change may not be obvious in all patients. Early repolarisation is a possible differential diagnosis, but is not consistent with the clinical history. Musculoskeletal pain does not produce these ECG abnormalities.

Q2. What might you expect to hear on auscultation in acute pericarditis?

Typically, there is a triphasic or systolic and diastolic pericardial friction rub. This is best heard over the left lower sternal edge at end expiration, with the patient sitting up and leaning forward. However, it may be intermittent so its absence does not rule out the diagnosis.

Q3. What other relevant physical signs might you be able to find in a patient with acute pericarditis?

Physical signs of pericarditis include fever, tachycardia and tachypnoea. If there is a significant pericardial effusion, the signs may also include cardiac dullness, a diminished or absent apical impulse, more distant sounding heart sounds and pulsus paradoxus (the latter is particularly important as it may indicate the early development of tamponade). 'Beck's triad' consists of hypotension, raised systemic venous pressure (especially jugular venous distension) and muffled heart sounds. It indicates the development of a significant tamponade.

Q4. What abnormalities does this ECG show?

The ECG illustrated shows typical concave, generalised ST elevation, reciprocal ST changes (ST depression) in leads aVR and V1, depressed PR segment and tachycardia. Depression

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of the PR segment is specific for acute pericarditis (it is due to subepicardial atrial injury and is seen in all leads except aVR and V1, which may show PR-segment elevation). Importantly, however, a normal ECG does not exclude pericarditis.

Q5. What are the ECG differences between acute myocardial ischaemia and pericarditis?

If there is no underlying ischaemic cardiac disease accompanying the pericarditis, the P-waves and QRS complexes are normal. The ST elevation is typically concave and generalised, and does not correspond to any coronary artery region anatomically (as would occur in myocardial ischaemia). There are no Q-waves or T-wave inversion at the time of ST-segment elevation in pericarditis. There is also no poor R-wave progression (unless this is due to pre-existing myocardial ischaemia). The voltage of the ECG may be low in pericarditis (due to pericardial fluid). Arrhythmias are rare in patients with pericarditis.

Q6. What is the staging of pericarditis according to ECG changes?

There are classically four ECG stages in the evolution of pericarditis; however, less than half of all patients are likely to follow this pattern. The stages are:

- Stage 1 begins in the first few days and may last a couple of weeks. During this time there is diffuse (typically concave) ST elevation.
- Stage 2 begins after several days and lasts for several weeks. The ST segments return to the baseline and the T-waves appear flattened.
- Stage 3 typically involves inversion of the T-waves in the opposite direction to the ST segment. This begins towards the end of the second or third week and lasts several weeks.
- Stage 4 lasts for up to three months. The T-waves gradually return to normal. **CT**

Key points

- **Patients with pericarditis may or may not have a viral prodrome. The most common viral symptoms are adenoviral – sore throat, headache and gastrointestinal tract symptoms.**
- **The nature of the pain is often useful in the diagnosis, especially if it is better leaning forward.**
- **The severe pain can resolve with analgesia very quickly, but the ECG changes can persist.**
- **Recurrence is possible but uncommon and more often seen in connective tissue disease.**
- **There may be an effusion on echocardiogram and it can be large.**
- **Effusion is uncommon and if it is significant it may need drainage. Pericardial constriction can occur late, so this should be kept in mind**
- **It is not uncommon to find a mildly elevated troponin level, probably due to some associated mild myocarditis.**
- **These patients usually do not have LV impairment, although it can occur.**