

# Dissecting the Diagnosis - An Unusual Case of Pericarditis

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## Abstract

*Chest pain is an extremely common presenting complaint on the acute medical unit. It is important to distinguish between patients who have serious pathology and those without. Often, the focus is on ruling out an acute coronary syndrome and inadequate consideration is given to other possible causes.*

*This case highlights the importance of performing relevant investigations in a timely manner, in order to ensure that a correct diagnosis is made.*

## Keywords

*Chest pain, pericarditis, aortic dissection, echocardiography*

## Key Learning points

- In all patients with pericarditis a cause should be sought
- All patients with pericarditis should undergo timely echocardiography
- Aortic dissection may present with signs and symptoms of pericarditis

## Case history

The patient, a 50 year old man, presented to the emergency department with a 2 day history of chest pain. Following initial assessment by the emergency department team he was referred to the acute medical unit for further investigations and management.

The chest pain was described as a feeling of heaviness in the chest, as well as a stabbing sensation. Onset was at rest and it had been constant for 48 hours prior to admission. He reported being unable to lie flat due to worsening of the pain in this position.

There was no history of recent flu-like illness reported. There was no leg pain or swelling. There was no recent long-haul travel.

Past medical history included hypertension and a previous ankle dislocation.

The only regular medication was enalapril 20mg daily for hypertension. For his chest pain he had tried ibuprofen purchased over the counter, with inadequate relief.

The patient worked in an office job and was a non-smoker. He drank 15-20 units of alcohol per week.

Examination was unremarkable. The chest was clear, heart sounds were normal and it was documented that no pleural or pericardial rub was present.

Observations are shown in Table 1.

**Table 1.** Basic observations on admission

| Parameter          | Value      |
|--------------------|------------|
| Oxygen saturations | 98% on air |
| Respiratory rate   | 18/minute  |
| Heart rate         | 55/minute  |
| Blood pressure     | 120/62mmHg |
| Temperature        | Apyrexial  |

Investigations revealed normal full blood count, urea and electrolytes. Troponin I was negative. Figure 1 shows the chest x-ray on admission. Figure 2 shows the admission ECG, which demonstrates changes consistent with pericarditis.

At this point a diagnosis of pericarditis was made and naproxen 500mg twice daily prescribed; arrangements were made for outpatient echocardiography and review in the ambulatory care unit the following week.

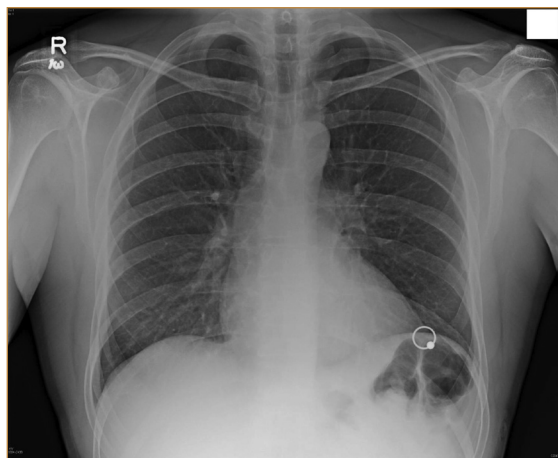
Five days after his initial presentation the patient attended for review on the ambulatory care unit. He reported an improvement in his symptoms with naproxen, with no further chest pain. The initial history was reviewed and on this occasion, he did report that prior to the onset of his original symptoms he had had a possible viral illness. Clinical examination was unremarkable.

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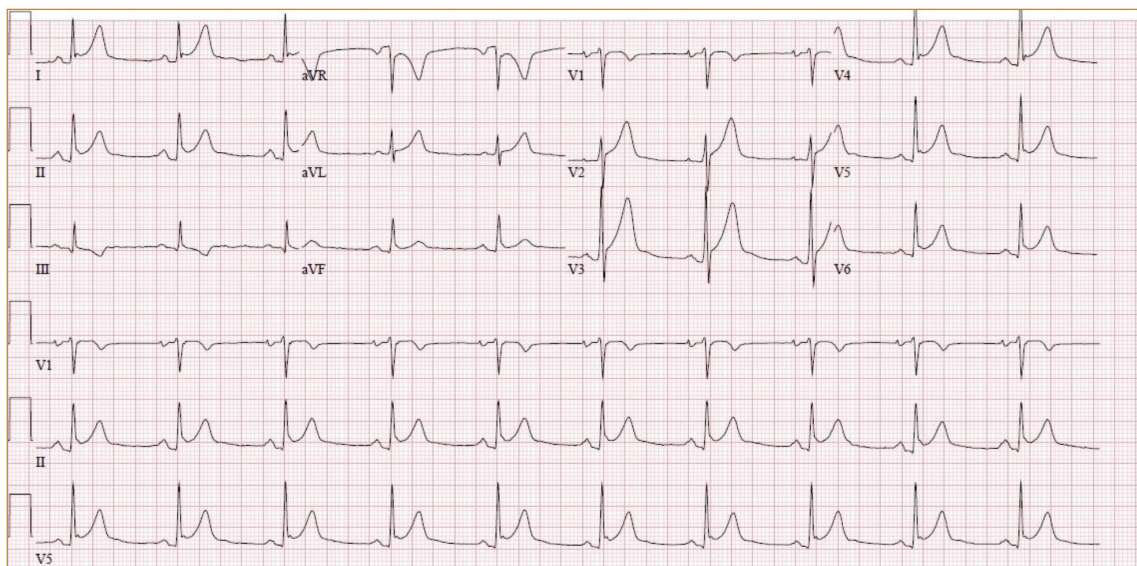
**Figure 1.** Chest x-ray on admission. No evidence of widening of the mediastinum.

Bloods at this time showed a troponin of 0.38 (normal range  $<0.04$ ). The ECG changes had largely resolved (Figure 3).

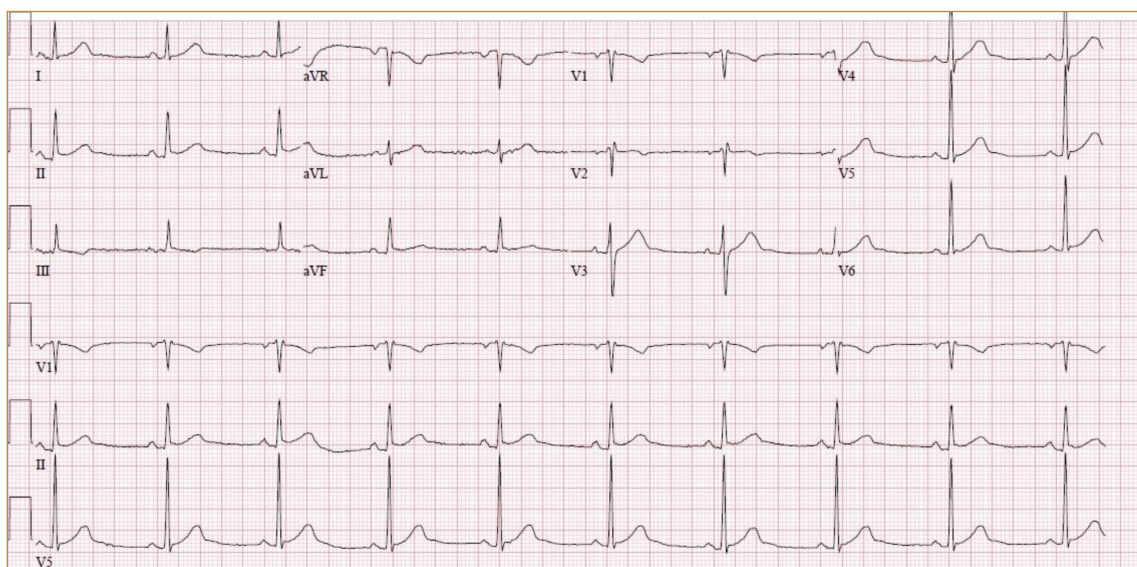
The patient was discharged, to await his outpatient echocardiogram, and advised to return if the pain worsened.

9 days after the initial presentation the patient attended for his echocardiogram. This was highly suggestive of aortic dissection, with a dilated ascending aorta and a linear reflection in the ascending aorta. He was admitted under the care of the medical team for ongoing management. He reported no further symptoms since his previous review.

At this point blood pressure was recorded as 156/92 in the right arm and 134/80 in the left arm.



**Figure 2.** ECG on admission, showing widespread saddle shaped ST elevation, as well as PR depression.



**Figure 3.** ECG performed when the patient returned for ambulatory care review on day 5. This shows resolution of the ST elevation and PR depression which were seen on the earlier ECG.

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Examination was otherwise normal, with no radio-radial or radio-femoral delay.

An urgent CT aorta was arranged, which confirmed the presence of a dissection flap in the ascending aorta (Figure 4). The findings were discussed with the cardiothoracics team at the local tertiary centre and urgent transfer of the patient was arranged. At the cardiothoracic centre aortic root replacement was undertaken that evening.

When seen in cardiology outpatients a year following his operation the patient was well, with blood pressure controlled on bisoprolol 5mg once daily and ramipril 10mg once daily. CT of his aorta performed at this time did not show any complications resulting from the repair. He continues to be followed up.

### Discussion

This case is of an aortic dissection presenting as pericarditis. Diagnosis and definitive treatment were delayed due to the delay in obtaining imaging with echocardiography.

Aortic dissection has an incidence of 0.5 to 2.95 per 100,000 per year with a mortality of 50-60% within 24 hours if left untreated<sup>1</sup>. Risk factors include hypertension (72% of cases<sup>2</sup>), aortic atherosclerosis, structural disorders of the aorta (aortic aneurysm, collagen disorders, aortic coarctation), previous aortic surgery, pregnancy and trauma<sup>3</sup>. Iatrogenic causes

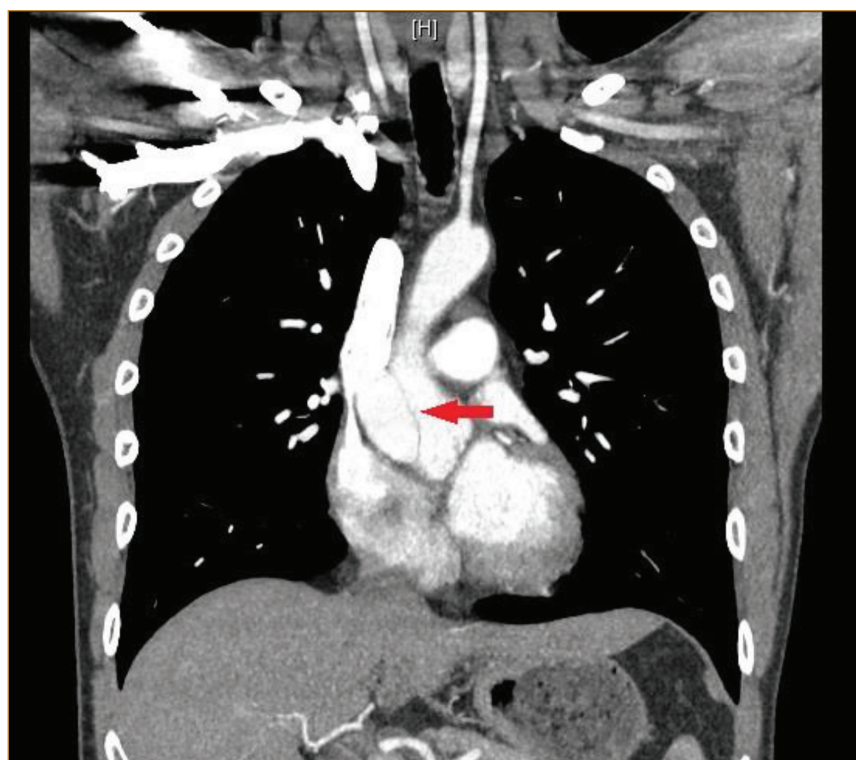
are also recognised, for example as a complication of coronary angiography<sup>4</sup>. It is more common in men, particularly between the ages of 50 and 70 years, and in patients of Afro-Caribbean origin<sup>5</sup>.

This patient was a 50 year old male with hypertension, hypertension being the main risk factor for aortic dissection<sup>2</sup>. However, on presentation his blood pressure was 120/62, suggesting excellent blood pressure control.

There are other reports of aortic dissection presenting with symptoms of pericarditis<sup>6,7</sup>, nevertheless this is not a common presentation of the condition. The usual presentation of aortic dissection is with chest pain, which is severe, and associated with hypotension and shock. Syncope is also a commonly recognised presentation<sup>2</sup>. Atypical presentations are not uncommon and a high index of suspicion must be maintained, as missing this diagnosis can result in a fatal outcome<sup>8</sup>.

Non-traumatic aortic dissection develops as a result of an intimal tear in the wall of the aorta. This allows blood to enter the potential space formed between the layers of the vessel wall, which causes propagation of the tear. A minority of tears are self-limiting and seal off; in the rest haemodynamic instability results<sup>3</sup>.

The mechanism for development of pericarditis in patients with aortic dissection is by retrograde dissection towards the heart, with leakage of blood



**Figure 4.** Image from the CT aorta performed on day 9. This shows a dissection flap within the ascending aorta, demonstrated by the arrow.

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into the pericardium. This causes an inflammatory process to develop and the signs and symptoms of pericarditis result<sup>2</sup>.

Chest pain is a common presenting complaint in the acute medical unit<sup>9</sup> and has many potential causes, including myocardial infarction, pericarditis and aortic dissection, amongst others. It has been suggested that 5% of presentations to emergency departments with chest pain may be due to pericarditis<sup>10</sup>.

The chest pain associated with pericarditis is often described as sharp or stabbing in nature and is typically made worse by lying down and is relieved by sitting forwards<sup>3</sup>.

Trans-thoracic echocardiography is recommended for all patients presenting with acute pericarditis<sup>11,12</sup>. Guidelines issued by the European Society of Cardiology<sup>11</sup> offer no recommendations on the timing of echocardiography, or whether it should be done on an inpatient or outpatient basis. The same guideline provides a triage tool for patients presenting with pericarditis. This tool enables risk stratification of patients with pericarditis, with low risk patients being appropriate for consideration of management on an outpatient basis. In order to apply this tool and risk stratify a patient one needs to know

whether the patient has a large pericardial effusion. This means that echocardiography (or alternative imaging which would allow detection of and quantification of the size of a pericardial effusion) would have to be performed before a decision to classify a patient as low risk and to follow up as an outpatient could be made.

The American Society of Echocardiography has issued guidelines on imaging in pericardial disease<sup>12</sup>. These advise that all patients with a diagnosis of pericarditis should undergo echocardiography within 24 hours of presentation.

In the case of this patient, had an echocardiogram been performed during his initial admission he would have had his aortic dissection identified at an earlier stage, which would have resulted in an earlier referral for cardiothoracic surgical intervention.

This patient did not suffer any adverse consequence as a result of the delay in making the diagnosis of aortic dissection. However, a very different outcome is not difficult to imagine.

### Declaration of competing interests

Nothing to declare

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