CASE REPORT

Striking temporally dynamic ECG changes associated with recurrent chest pain in a case of myopericarditis

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SUMMARY

A 33-year-old man without medical history or cardiovascular disease risk factors presented with recurrent progressively worsening chest pain that had been preceded by few days of flu like illness. His initial ECG and troponin rise supported the diagnosis of myopericarditis for which he was treated with aspirin and non-steroidal anti-inflammatory drugs (NSAIDs) with good response initially. He later on developed severe recurrent chest pain and became tachycardic and hypotensive. Serial ECGs revealed a pattern of significant dynamic ST elevation in several leads,

a pattern that is not usually seen in pericarditis.

Subsequently, features of bedside echo did not support the diagnosis of acute ST-elevation myocardial infarction. The patient did well on conservative management with NSAIDs. He did not undergo urgent coronary angiography which would not have offered the patient any clinical benefit at the time and would have put him at procedural risk unnecessarily. The diagnosis of myopericarditis was confirmed retrospectively with typical features on cardiovascular magnetic resonance.

Figure 1 ECGs showing striking dynamic ST elevation in all leads (except V1 and aVR) associated with chest pain.

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BACKGROUND

This case demonstrates an uncommon feature (significant dynamic ST elevation) of a fairly common condition (acute pericarditis) which might be misinterpreted as a life-threatening condition (acute ST-elevation myocardial infarction (STEMI)). The approach and management of the two conditions is completely different which is also highlighted in the way we managed this case. The role of different imaging modalities (echo and MRI) in differentiating causes of chest pain is also addressed. We believe this case sends a useful message to all those involved in the care of patients presenting with acute chest pain which remains one of the most common presentations to cardiac and acute medical units.

CASE PRESENTATION

A 33-year-old man without cardiovascular risk factors or medical history but 10 days history of flu-like illness was admitted because of recurrent and progressively worsening central chest pain over the preceding 3 days. His pains exhibited

positional element and prevented deep inspiration but no pericardial or pleural rub were present.

The following day the patient suffered recurrent severe chest pain, associated with tachycardia and hypotension, which ultimately responded to pain relief with intravenous opiates.

INVESTIGATIONS

On day 1, initial ECG showed sinus rhythm and concave ST segment elevation in all leads (except leads V1 and aVR) and a hint of PR depression. Bed-side echocardiography revealed normal biventricular size and function, no resting regional wall motion abnormalities (RWMA) and absence of pericardial effusion. Troponin-I was 3.28 (normal <0.03), C reactive protein (CRP) 22 and normal full blood count.

On day 2, repeat ECG during chest pain revealed significant dynamic ST elevation in all leads (except V1 and aVR), PR depression and no reciprocal ST depression. ST elevation of 5–6 mm was observed in leads V3–4 (figure 1). Urgent repeat echo during pain again confirmed absence of any RWMA.

Figure 2 (A and B) demonstrating 'Oedema-imaging' (A) short tau inversion recovery (STIR) image, (B) SSFP prepared T2 weighted (normalised). Yellow arrows demonstrating areas of relative increased signal intensity (2.5-fold as compared with septum, 2.7-fold as compared with skeletal muscle, identical relative ratios for both sequences) implying increased free tissue water. (C–F) demonstrating phase-sensitive inversion recovery 'late gadolinium imaging' of the four, three, mid-ventricular short axis and two-chamber views respectively. Yellow arrows highlight widespread localised late enhancement in a mid-wall and midwall-epicardial type pattern. SSFP, steady state free precession.

Given the reassuring absence of any RWMA on echo and knowing that ECG changes (just like the pericardial rub) can be dynamic and that PR depression precedes ST elevation in pericarditis^{1 2} we resisted the strong urge (after discussion with the on call Interventionalist) to perform diagnostic coronary angiography and continued to treat the patient as myopericarditis which was subsequently confirmed by the presence of characteristic changes on cardiac MRI (CMR imaging) (figure 2).

DIFFERENTIAL DIAGNOSIS

On day 2 differential diagnoses lay between acute STEMI and myopericarditis. Early recognition of acute myocardial infarction is crucial for timely initiation of revascularisation protocols.

TREATMENT

Treatment with aspirin and non-steroidal anti-inflammatory drugs (NSAIDs) was started with initially good effect for a working diagnosis of myopericarditis.

OUTCOME AND FOLLOW-UP

The patient did not experience any significant arrhythmias during 72 h ECG monitoring and became pain free on above-mentioned drug therapy prior to discharge.

DISCUSSION

Echo and CMR are valuable non-invasive tools which can help establish the cause of acute chest pain. Timely initiation of therapeutic intervention cannot be overemphasised.

Koos *et al* reported a case of atypical chest pain and tachycardia. Her ECG showed atrial fibrillation with ventricular rate 140/min. CRP was elevated and troponin and echo were normal. This patient later on underwent CMR to look for evidence of myocardial involvement. CMR confirmed pericarditis (thickened pericardium with late gadolinium enhancement) and ruled out myocarditis.³

Yang *et al*⁴ described a case of acute pericarditis developed 36 h after percutaneous coronary intervention (PCI) procedure with fever and severe chest pain. ECG showed ST elevation in inferior-lateral leads. However, the follow-up coronary angiography showed negative result and the symptom improved dramatically with NSAID treatment. They concluded that, therefore, it is important for the clinician to differentiate acute myocardial infarction/acute stent thrombosis from this rare complication after PCI.⁴

Learning points

- ▶ Striking temporally dynamic ECG changes can occur during an episode of acute myopericarditis.
- ▶ Echocardiography during episodes of pain/dynamic ECG changes should guide the need for invasive assessment.
- ▶ Cardiac magnetic resonance can confirm the diagnosis thereby ultimately avoiding the need for coronary angiography in selected cases.

Competing interests None.

Patient consent Obtained.

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