Atypical variant stress (Takotsubo) cardiomyopathy associated with gastrointestinal illness: rapid normalisation of LV function

Jonathan Michel, Tammy Pegg, David Porter, Nicholas Fisher

Abstract

A 34-year-old female with a diarrhoeal illness and palpitations was found to have an abnormal ECG and troponin T. Subsequent coronary angiography identified angiographically normal epicardial coronary arteries with moderate impairment of left ventricular systolic function due to mid-ventricular akinesis with apical hyperkinesis. Cardiac MRI, performed 1 week later, demonstrated complete resolution of ventricular dysfunction and a diagnosis of atypical variant stress cardiomyopathy, due to gastrointestinal illness, was proposed.

Stress cardiomyopathy is an increasingly recognised condition identified most commonly in patients presenting to hospital with acute coronary syndrome who are subsequently found to have no angiographically significant coronary artery stenoses. It is characterised by transient impairment of the left ventricle (LV) typically involving the apex.

In this case report we describe the finding of moderate left ventricular impairment involving the mid ventricle that resolved fully within a week of diagnosis, in a patient with atypical features of presentation.

Case report

A 34-year-old female smoker with a history of anxiety and depression presented to the emergency department with a history of an exacerbation of chronic mechanical back pain 5 days before, followed by 2 days of diarrhoea and vomiting. Her gastrointestinal symptoms began to settle spontaneously, however, she developed rapid palpitations further exacerbating her anxious state. There was no history of chest pain, presyncope or syncope. There had been no other recent significant emotional stressor.

On examination the patient was extremely anxious and tearful, of slim build, warm and well perfused with diaphoresis. Temperature 36.6°C, heart rate 90 bpm, blood pressure 99/60 mmHg and oxygen saturation of 96–98% on room air. Cardiac, respiratory and abdominal examinations were otherwise unremarkable.

The full blood count revealed a mild neutrophilia (WCC 15.9×10^9/L, PMN 12.4×10^9/L) with an elevated CRP of 48 mg/L (<5 mg/L). Serum electrolytes, creatinine, liver function tests, amylase, thyroid function and urinary catecholamines and metanephrines were within normal limits.

Electrocardiography demonstrated high-lateral T wave inversion and abnormal R wave progression. Cardiac telemetry remained normal during hospital admission and a routine chest radiograph was unremarkable.
Cardiac enzymes were elevated at presentation with an initial troponin T of 0.14 ng/ml (0.00–0.03 ng/ml) that remained unchanged on serial testing 3 hours later. Seventy-two hours after admission the troponin had fallen to 0.04 ng/ml.

An exercise stress test was negative for inducible ischaemia and cardiac catheterisation revealed angiographically normal epicardial coronary arteries. Left ventriculography demonstrated impaired function of the mid ventricle with hyperdynamic function of the apex (Figure 1).

**Figure 1. Mid-wall predominant stress cardiomyopathy—left ventriculography during diastole (left) and systole (right) demonstrating moderate impairment of systolic function with hypokinetic basal walls, akinetic mid ventricle and hyperkinetic apical function**

Cardiac magnetic resonance imaging performed 6 days post angiography demonstrated complete resolution of the left ventricular impairment with no evidence of infarction or myocarditis.

A diagnosis of atypical variant Takotsubo syndrome secondary to anxiety or diarrhoeal illness was presumed. The patient made a complete recovery and remained fit and well on subsequent assessment with no long-term cardiac medication.

**Discussion**

The largest case series of patients with stress cardiomyopathy to date demonstrated that the majority of patients are post menopausal women presenting with symptoms of acute coronary syndrome, syncope or heart failure. Only 8% of cases occurred in females under the age of 50.

A mid-ventricular pattern of LV impairment was seen in 17% of cases. Our case is unusual for the pattern of ventricular impairment and the manner of presentation, given a history of only relatively minor physical stress. It is also an example of the rapidity with which significant LV impairment can return to normal in patients with stress cardiomyopathy.
This case also serves to demonstrate the wide variability in presentation of patients with transient angiographic LV dysfunction and the fact that many cases are likely to go unrecognised. However, the continuously improving sensitivity of cardiac enzyme assays in addition to routine use of coronary angiography in patient investigation is likely to result in increasing identification of this condition.

The diagnosis of stress cardiomyopathy may be suspected based on clinical and patient characteristics. It is generally associated with a low in-hospital mortality and an excellent long-term prognosis, however, adequate imaging of the ventricles and coronary arteries remains vital to exclusion of other potentially serious pathology.

Author information: Jonathan Michel, Cardiology Advanced Trainee, Wellington Hospital, Wellington; Tammy Pegg, Cardiologist, Nelson Hospital, Nelson; David Porter, Physician and Rheumatologist, Nelson Hospital, Nelson; Nicholas Fisher, Interventional Cardiologist, Nelson Hospital, Nelson

Acknowledgement: We thank Julie Walker (Radiographer, Nelson Hospital).

Correspondence: Jonathan Michel, Department of Cardiology, Wellington Regional Hospital, Riddiford St, Newtown, Wellington, New Zealand. Email: jonathan.michel@ccdhb.org.nz

References:

