

Recurrent Takotsubo syndrome with variable echocardiographic and electrocardiographic appearances

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Takotsubo syndrome (TS) (also known as apical ballooning syndrome) is characterised by acute but usually rapidly reversible left ventricular (LV) dysfunction with distinct wall motion abnormalities.^{1,2} The condition tends to occur in postmenopausal women after a stressful event. Recurrent TS is not uncommon and can exhibit variations in triggering factors and ventricular wall motion patterns.^{3,4} We describe a case in which the pattern of regional wall motion and the associated ECG changes differed between the first and the recurrent admission.

Case report

A 61-year-old Māori woman with a previous history of TS presented with chest pain, dyspnoea and elevated troponin T (175ng/L [normal range: 0–15]). Electrocardiogram (ECG) on arrival showed sinus rhythm with no ischaemic changes and a prolonged QTc of 498msec (Figure 1A). Given her multiple cardiac risk factors of hypertension, hyperlipidaemia and family history of premature coronary artery disease, coronary angiography was performed and revealed trivial coronary artery disease. Transthoracic echocardiogram (TTE) demonstrated hyperdynamic LV apex with relative hypokinesis of the basal segments and preserved systolic function, suggestive of reverse or basal TS (Figure 1B, Video 1 [please contact the corresponding author for video files]). There was no identifiable pre-event stressor despite specific enquiry after the diagnosis was made. Repeat TTE 3 months later showed complete resolution of wall motion abnormalities.

Fourteen years ago, she presented with similar complaints with no identifiable stressor. ECG on arrival showed widespread deep T-wave inversion and a prolonged QTc of 480msec (Figure 1C). Coronary angiography revealed normal coronary arteries. TTE showed moderate systolic impairment with akinesis of the apex, consistent with apical TS (Figure 1D, Video 2 [please contact the corresponding author for video files]). Follow-up TTE showed normalisation of cardiac function and

resolution of wall motion abnormalities.

Discussion

Our patient presented many years ago with apical TS and an ECG that showed widespread deep T-wave inversion with a prolonged QTc interval. Because of this prior TS diagnosis, the clinical team were suspicious that the current presentation was a case of recurrent TS. However, they were uncertain about the diagnosis because the ECG did not show the deep T-wave inversion or the apical akinesis seen at the index admission. However, the ECG did show QTc interval prolongation, which is typical of TS, and review of the echo identified the reverse variant. Clinicians should understand that both the pattern of wall motion abnormality and ECG changes can vary markedly between presentations in the same patient. They should also be aware that TS can recur many years later.

TS mimics acute coronary syndrome (ACS) but has a distinct pathophysiology. Four different echocardiographic variants of TS have been described, including apical, mid-ventricular, basal/reverse and focal types.^{2,5} A fifth variant of TS has also been described recently where the mid-left ventricle is hyperdynamic but the apex and base are akinetic or hypokinetic (reverse mid-ventricular Takotsubo).⁶ Several ECG features of TS have been reported that may help to differentiate TS from an ACS, including absence of reciprocal changes, absence of abnormal Q-waves, progressive QTc interval prolongation and widespread T-wave inversion.⁷

Recurrence of TS is not an uncommon phenomenon. The incidence of TS recurrence is estimated to range from 4.7% to 5% at long-term follow-up.^{4,8} The variation in echocardiographic variants between index and recurrent TS events in some patients has been previously described.^{8,9} This observation cannot be explained by the hypothesised pathophysiological causal mechanisms. The variability in the pattern of wall motion abnormality between episodes casts doubt on

the hypothesis that the observed regionality is related to variation in beta-receptor density and sensitivity.¹⁰

Another hypothesis is that a previous episode of TS may protect the previously affected region in the TS recurrence, with a higher vulnerability of other regions.¹¹ However, previous reports have described recurrent cases of TS with the same ventricular wall

motion pattern, similar to the index event.⁴

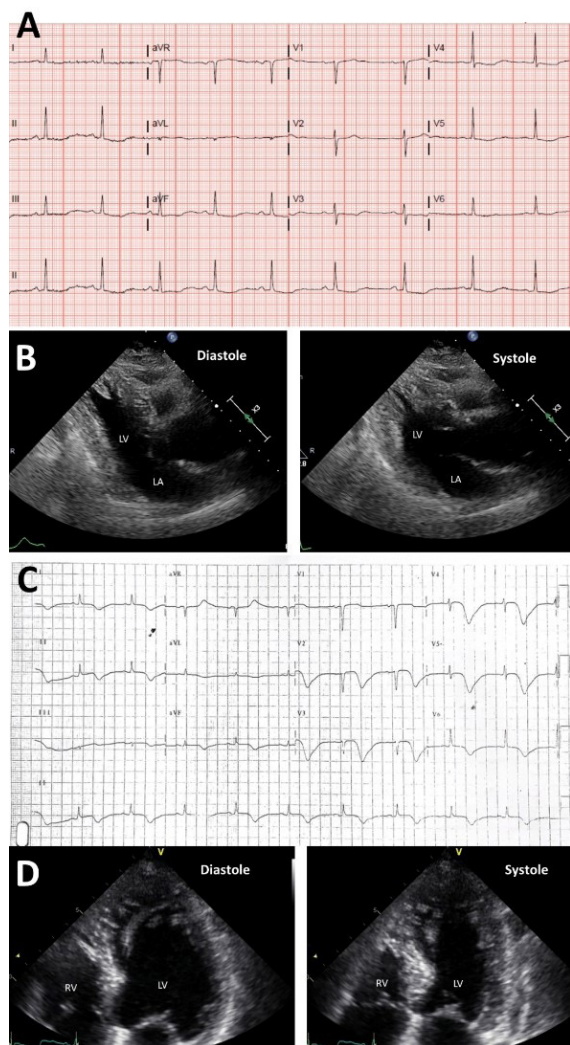
To our knowledge the variation in ECG pattern we observed between recurrent events with differing echocardiographic variants has not previously been described and should be further investigated. Further study is required to clarify the aetiology of this novel condition and identify effective preventive strategies.

Figure 1: A. Electrocardiogram (ECG) on admission demonstrated normal sinus rhythm with no ischaemic changes and prolonged QTc.

B. Echocardiography showed akinesis of the basal segments and hypercontractility of the mid to apical segments of the left ventricle consistent with basal or reverse type of Takotsubo syndrome.

C. ECG 14 years ago showed global giant T-wave inversions with prolonged QTc.

D. Echocardiography 14 years ago showed akinesis of the mid to apical segments and hypercontractility in the basal segments of the left ventricle consistent with apical type of Takotsubo syndrome.



LV = left ventricle; LA = left atrium; RV = right ventricle

COMPETING INTERESTS

Nil.

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