

Country cardiograms case 56: Answer

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Sinus bradycardia is present, with a heart rate of 56 beats/min. The PR interval, QRS duration, QT interval, axis, P waves and QRS morphology are all within normal limits. The obvious, striking abnormality lies in the T waves. Deep, symmetric T-wave inversion is present in leads I, aVL, II, aVF and V2 through V6. ST segments are slightly depressed and down-sloping in most of these leads. These generalized changes in the electrocardiogram (ECG) contribute to a diagnosis of ischemia.

The patient's troponin levels rose to 361 ng/L (results of 100–2000 ng/L suggest that acute myocardial infarction [MI] is likely). She is treated as having a non-ST elevation MI and is transferred to a larger centre for further investigation and treatment.

Coronary angiography shows only minor atherosclerosis, with 30%–40% narrowing of the left anterior descending artery and minimal irregularities in the other vessels. Left ventricular angiography is reported as showing an ejection fraction of 40%, with distal anterior and apical dyskinesia.

The patient makes an uneventful recovery from a cardiac perspective.

There are a number of features in this case that, in retrospect, suggest takotsubo cardiomyopathy (also known as broken-heart syndrome, apical ballooning syndrome and stress cardiomyopathy).

These include the following:

- history of overwhelming emotional and physical stress in an elderly woman (a 9:1 female:male ratio has been reported)^{1,2}
- chest pain
- new ECG changes (in this case,

T-wave inversion, although ST-segment elevation is also a common finding)

- moderate rise in troponin level
- dyskinesia of the left ventricle involving the anterior and apical segments (“takotsubo” refers to the shape of a basket used to catch octopuses in Japan, mimicked by the left ventricular angiogram in typical cases, although variants occur)
- absence of significant coronary artery stenosis
- resolution with conservative management and supportive care

Takotsubo cardiomyopathy has a reported prevalence of 2% of presentations of acute coronary syndrome. A surge in catecholamines as a result of massive stress, with resulting cardiotoxicity and microvascular spasm, is thought to be the mechanism. Additional catecholamine release due to cold exposure may account for the slightly higher reported incidence in winter. The condition was first described in Japan in 1990.³

Attempts have been made to distinguish the typical ECG findings of takotsubo cardiomyopathy from those of acute MI. In both cases, the findings may include ST elevation or T-wave inversion, and a lengthened QT interval. It is reported that in takotsubo cardiomyopathy precordial leads V4 through V6 are most commonly involved, that the degree of ST elevation is less, that reciprocal ST-segment depression changes are less evident and that pathological Q waves are less frequent.⁴ Diffuse changes, as seen in this case, not confined to any particular anatomic territory, may also be likelier in takotsubo cardiomyopathy.

From the perspective of a physician in a rural or remote emergency department, however, none of these criteria are specific enough to justify different initial management. In a case such as this, with a history of overwhelming stress precipitating chest pain, takotsubo cardiomyopathy can thus be suspected, but not diagnosed, and standard management according to protocols of ST elevation MI or non-ST elevation MI is indicated. This uncertainty requires an acceptance by the treating physician that a proportion of patients will receive unnecessary thrombolysis, but that the benefits of thrombolysis still outweigh the risks.

In this case, although many of the hallmark features of takotsubo cardiomyopathy are present, the retrospective diagnosis could be made with greater confidence if an echocardiogram report showing apical ballooning were available.

The precipitating stressful event may not always be evident. In cases of chest pain in the rural emer-

gency department, it is therefore prudent to inquire about possible overwhelming stressors and to offer as much emotional support as possible.

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For the question, see page 53.

Competing interests: None declared.