

## Country cardiograms case 65: Answer

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The ECG shown in Figure 1 displays sinus bradycardia, with a rate of 57 beats/min. The PR interval is slightly prolonged (0.215 s), and there is a suggestion of left atrial abnormality in lead II. Otherwise, it appears normal; QRS duration is 0.095 s.

Significant interval changes are evident when comparing Figures 1 and 2. Figure 2 displays normal sinus rhythm at a rate of 77 beats/min. Left axis deviation has developed, with a shift in axis from +40° to -40°. QRS complexes have become wider, with QRS duration now measured at 0.110 s. Slurring of R waves is noted in leads I and aVL, in a pattern consistent with incomplete left bundle branch block (LBBB). ST segments are elevated with a normal contour in leads V1 and V2 and are depressed in leads I, II, aVF, V4 and V5. T waves were previously upright in lead aVL but are now gently inverted.

Given the clinical presentation and ECG findings, an immediate consideration, in a remote ER where transfer times are inevitably long, is whether the ST-segment elevation in V1 and V2 may represent a ST-elevation myocardial infarction (STEMI) and thus may present an indication for thrombolysis. New or suspected-new LBBB was once considered to be an indication for thrombolysis in clinical situations consistent with myocardial infarction. However, this was removed from the 2013 criteria, given its documented low accuracy as a stand-alone ECG finding.<sup>1</sup> In contrast, the significance of a pattern of incomplete LBBB in

such situations is unclear.

This has relevance in this case, where features of a new incomplete LBBB have developed. The ST-segment elevation noted in V1 and V2 can be explained as being secondary to incomplete LBBB and has a non-coved contour that is consistent with this. Given the risks inherent in administering thrombolysis, it would be hard to unequivocally justify its use in these circumstances.

Whereas some of the ST depression seen in Figure 2 can also be explained regarding repolarisation changes associated with incomplete LBBB, its widespread occurrence is unusual and suggests primary ST-segment depression and a possible non-STEMI (NSTEMI). Alternatively, this could be interpreted as possible reciprocal ST-segment depression associated with a STEMI, and hence possibly supportive of a decision to administer thrombolysis. Regardless of the precise diagnosis on the STEMI–NSTEMI – unstable angina spectrum, we interpret the development of a new incomplete LBBB pattern in association with on-going symptoms of chest pain as a strong indicator of an acute coronary syndrome.

A decision on whether or not to administer thrombolysis should not be made on ECG criteria alone but should take clinical context and progress into consideration. In this case, the administration of sublingual nitroglycerine led to a decrease in chest pain symptoms. After conferring with a cardiologist (which included ECG review), we chose not to administer

thrombolysis, and rather to treat this patient with a nitropatch (0.2 mg/h) subcutaneous enoxaparin 100 mg s.c., atorvastatin 80 mg p.o. and clopidogrel 600 mg p.o. (in addition to the Acetylsalicylic acid (ASA) 325 mg that was given on arrival), while preparations were made for an emergency transfer by air to a facility with cardiac catheterisation capabilities. The patient's chest pain symptoms progressively decreased, and he was pain-free at the time of transfer, which was uneventful.

The initial troponin level, performed in our facility, was negative (<40 ng/L). Troponin levels measured after arrival in the receiving hospital were significantly elevated (1600 ng/L), allowing a diagnosis of probable NSTEMI to be made. Coronary angiogram results included significant left main coronary artery disease and extensive triple-vessel disease. Intravenous heparin and intravenous nitroglycerine were commenced, and

the patient was scheduled for urgent coronary artery bypass graft.

In many cases, ECG findings and criteria allow for a straightforward decision to be made on whether or not to administer thrombolysis. In other cases, such as the case, we describe here, such a decision may be more challenging, and rationales can be advanced both for and against thrombolysis. In such cases clinical parameters and response to medications, such as nitroglycerine, can help guide decision-making.

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## REFERENCE

1. Thygesen K, Alpert JS, Jaffe AS, Simoons ML, Chaitman BR, White HD, *et al.* Third universal definition of myocardial infarction. *Circulation* 2012;126:2020-35.

**For the question, please see page 23**

## Submissions for Rural Research Poster Presentation

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Poster presentations will be held April 5<sup>th</sup> 2019 at the Halifax Convention Centre, NS.

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