

Guilt by Association

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An elderly man gives a history of recent brief episodes of dizziness and near-syncope. He is not taking any medications. His ECG (Figure 1) and the accompanying rhythm strip (Figure 2) are shown.

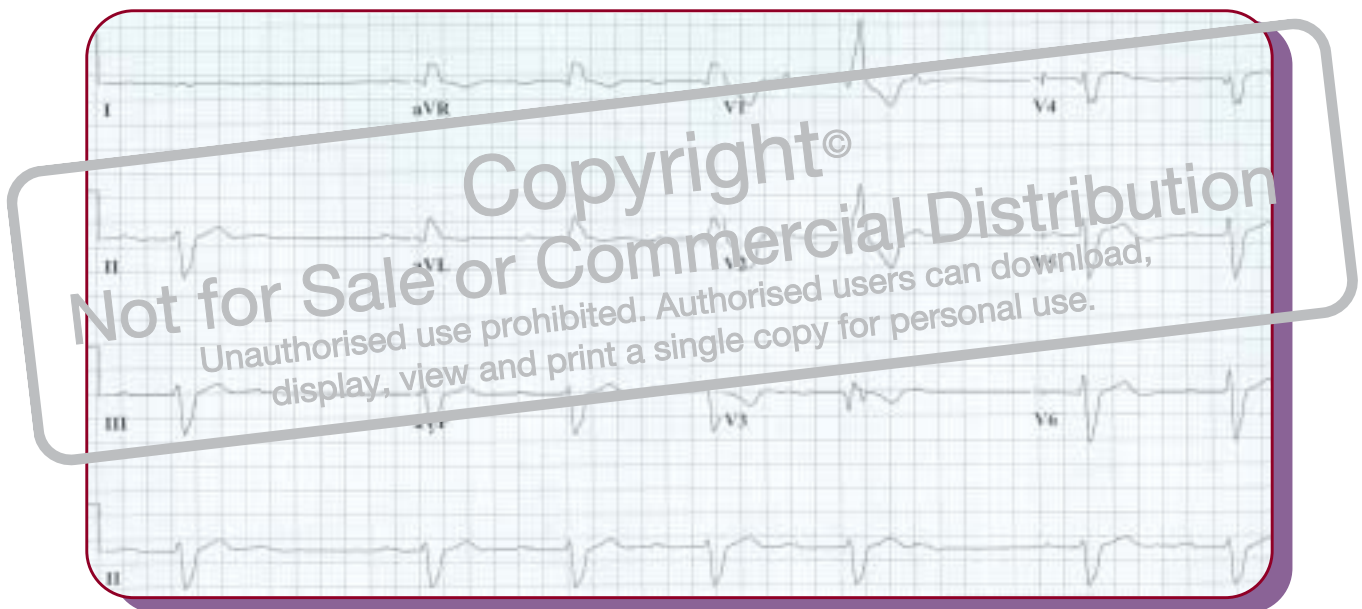


Figure 1. ECG obtained on presentation.



Figure 2. The patient's rhythm strip, obtained on presentation.

1. *What conduction disturbances are shown?*

2. *What is the likely anatomic location of the problem?*


This Month's ECG Diagnosis

1. The rhythm is irregular and the QRS complexes are abnormal, demonstrating a right bundle-branch block (RBBB) pattern. There are Q waves in leads V₁ through V₄, in keeping with an old anteroseptal MI. The QRS axis in the frontal plane shows pathologic left axis deviation. Although the P waves are of low amplitude in the limb leads, inspection of V₁ confirms the presence of sinus rhythm at a rate of approximately 45 beats per minute. The pattern of Wenckebach periodicity can be readily appreciated, with progressive prolongation of the PR interval of consecutively conducted P waves until a non-conducted P wave occurs.

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2. Wenckebach conduction (Mobitz type I block) is most commonly the result of impairment of conduction at the level of the atrioventricular (AV) node, and is often temporary or reversible. Common causes are drugs that interfere with AV node conduction (e.g., digoxin, beta-blockers and some calcium channel blockers) and acute inferior MI with activation of associated autonomic reflexes and AV node ischemia. Wenckebach conduction in the absence of bundle-branch block (BBB) is almost invariably AV nodal; in the presence of BBB, it may be either AV nodal, or, less commonly, distal to the AV node within the His-Purkinje system (HPS).

In this patient, there is evidence of extensive conducting system disease. Pathologic left axis deviation in the presence of RBBB indicates bifascicular block, so that conduction to the ventricles occurs exclusively via the left posterior fascicle of the left bundle branch. The presence of Wenckebach conduction in this setting indicates a tenuous path for conduction; the block may be in the posterior fascicle, the AV node or at both levels. The risk of complete heart block is high, potentially with a very slow idioventricular escape rhythm.

The patient's symptoms were most likely due to intermittent complete heart block, so a permanent pacemaker was implanted. 

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