

# ECG of the Month



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## Which block is it?

Below is the ECG of an 81-year-old woman who presented to the office saying she had not been feeling well for the past three days.

*What is the diagnosis?*

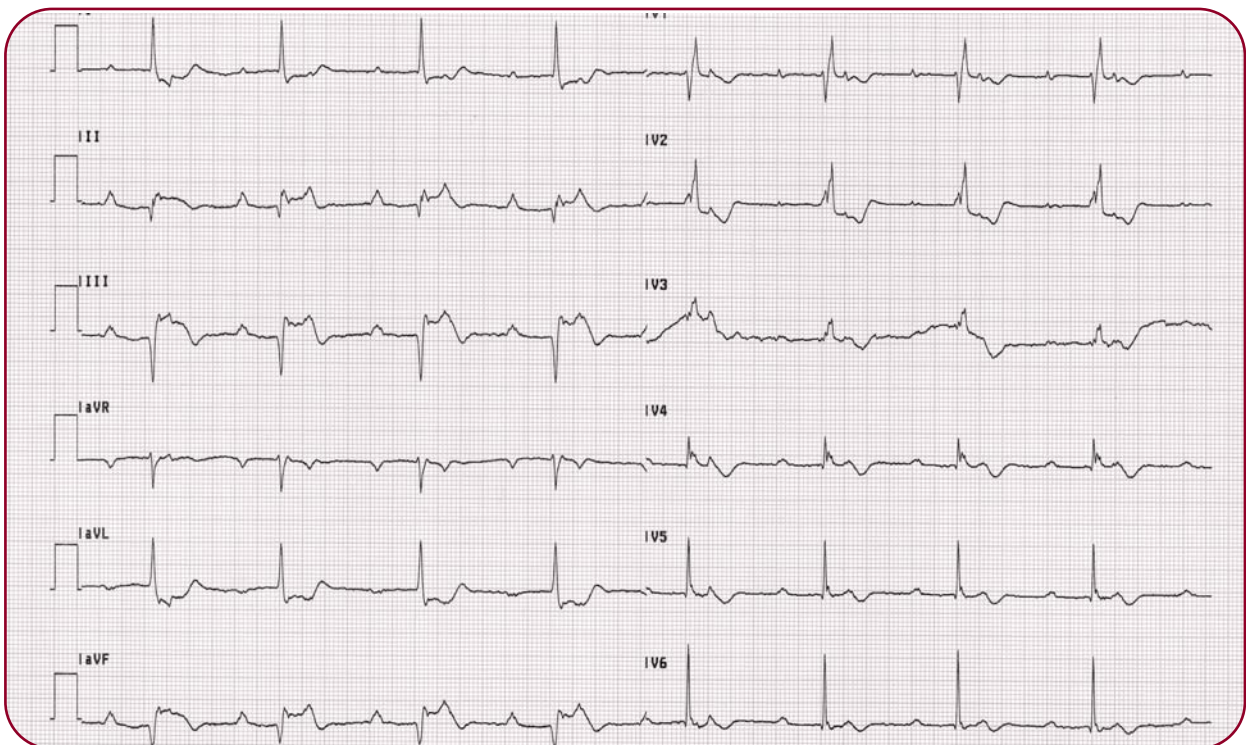
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## This Month's ECG Diagnosis

The ECG shows a sinus rate of about 100 beats per minute (bpm), with a ventricular rate of 50 bpm. The PR interval is constant and prolonged to about 380 msec. The QRS is wide, showing terminal R wave in lead  $V_1$ , which is indicative of right bundle branch block (RBBB). There are Q waves in leads II, III and aVF associated with ST elevation in leads II, III and aVF. There is ST segment depression in lead I and aVL.

This ECG shows 2:1 atrioventricular (AV) block, evidence of a recent inferior infarction, and the presence of RBBB. The issue in the presence of 2:1 AV block is the distinction between proximal (AV nodal) block versus distal (infra-nodal) block. These blocks have very different prognostic implications. Distal AV block is almost always an indication for permanent pacing. Conversely, proximal AV block is often associated with a good ventricular escape; in the presence of evolving inferior infarction, it usually resolves spontaneously.

In this particular case, we have reasons to postulate either proximal or distal block. Proximal AV block is usually what is seen in the presence of acute inferior wall infarction, as is evidenced in this case by the Q waves and ST elevation in II, III, and aVF. On the other hand, this patient has clear evidence of distal

conduction disease demonstrated in the wide QRS and RBBB. Therefore, the distinction between proximal and distal AV block is critical, and must be made based on other features.

Generally, in the face of inferior wall infarction, proximal AV block is usually associated with Wenckebach periodicity. Unfortunately in this case, the block is 2:1 and, as such, there is no opportunity to establish this periodicity; hence, this cannot be used as a distinguishing feature.

The prolonged PR interval associated with the conducted beats is generally a feature of AV nodal block rather than infra-nodal block. It would be almost impossible to conceive of such marked conduction delay (PR interval of about 400 msec) occurring in the infra-nodal region. In keeping with the evolving inferior infarction, this degree of conduction delay is almost exclusively associated with AV nodal conduction delay. The PR interval hints that this 2:1 block is AV nodal rather than infra-nodal and, therefore, the patient is likely to recover without requiring permanent pacing.

Indeed, this patient's conduction system recovered over the next few days, and she soon developed 1:1 conduction with no need for a permanent pacemaker. 