

ECG CLINIC

Hazardous behaviour?

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Vignette

A 72-year-old man undergoes uneventful implantation of a ventricular inhibited (VVI) permanent ventricular pacemaker for treatment of symptomatic sinus node dysfunction. Two days later, he returns to the hospital complaining of recurrent dizzy spells and chest pain. The ECG shown in Figure 1 is recorded.

Questions

1. What is the likely explanation for his chest pain?
2. Is his pacemaker function satisfactory?
3. Is there any cause for particular concern?

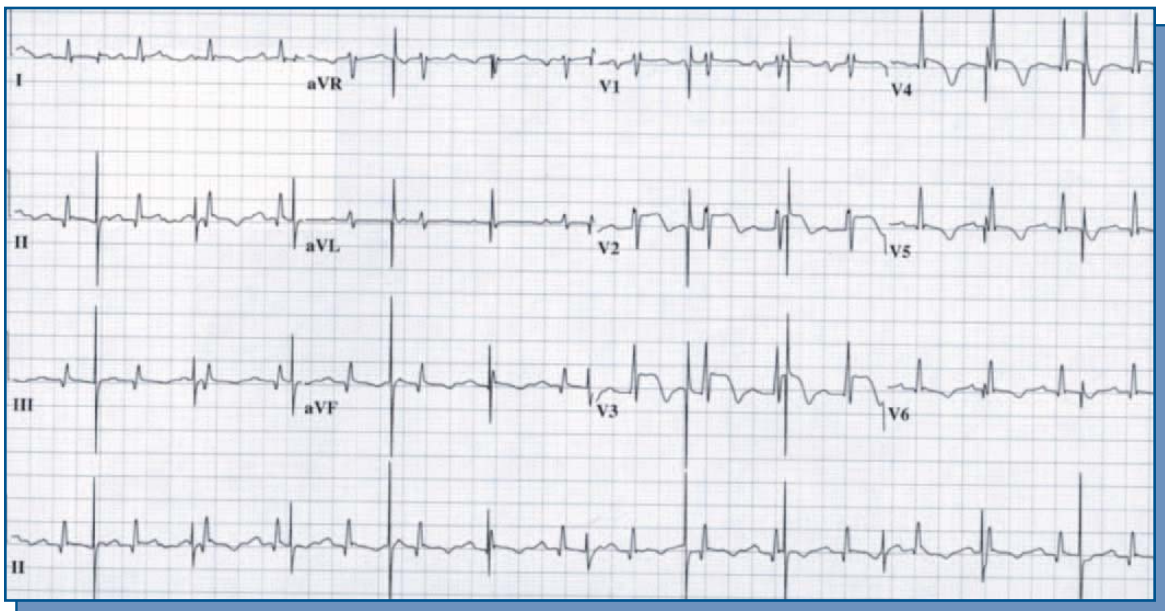


Figure 1

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Answer

1. The ECG shows rhythm with first-degree AV block and an incomplete right bundle-branch block pattern. There is ST-segment elevation in leads V2, V3 and V4 along with T wave inversion. These are the changes of an acute, or very recent, anterior myocardial infarction (MI) which is the most likely explanation for his chest pain.

2. Pacemaker spikes can be seen throughout the recording at a rate of 70 per minute, which is the usual “default” rate for a VVI pacemaker. However, there is failure of both sensing (inhibition of pacemaker firing following a spontaneous QRS complex) and capture (initiation of a QRS complex when the pacemaker fires out-with the refractory period of the ventricles). In a patient who has only recently undergone pacemaker implantation, the most likely explanation is displacement of the pacemaker lead.

3. Under normal circumstances, there would be no cause for particular concern other than a need to reposition the pacemaker lead to ensure satisfactory pacemaker function. Sensing failure may result in inappropriate pacemaker firing, which may occur during the so-called “vulnerable period” (around the apex of the T wave). Provocation of ventricular fibrillation or life-threatening ventricular arrhythmias by such an event in a stable patient is exceptional. In this case, however, the presence of an acute MI denotes an electrically unstable myocardium. Such a complication is a distinct possibility, thereby making the correction of the problem an urgent matter. For the same reason, the practice of routinely obtaining an ECG during magnet application to inhibit sensing and confirm pacemaker activity should be avoided in pacemaker patients with known, or suspected, acute MI. \mathcal{D}



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