Early Warning

By Keith J.C. Finnie, MB, ChB

Vignette

A 69-year-old man presents complaining of stuttering chest pain over the preceding two to three hours. At the time of your initial assessment, his chest pain appears to be settling and his cardiovascular examination is normal. An electrocardiogram (ECG) is recorded (Figure 1).

Question

What is your ECG interpretation?

Answer

The ECG shows sinus rhythm at a rate of 75 beats per minute, with a slightly leftward frontal plane axis and normal atrioventricular conduction. The QRS configuration is normal and the ST segments are isoelectric. The T waves in precordial leads V_2 to V_5 are abnormal in both amplitude and configuration, exceeding 15 mm in height and appearing unusually symmetric. Normal T waves should be slightly asymmetric, with a more gradually sloping ascending limb, and should not

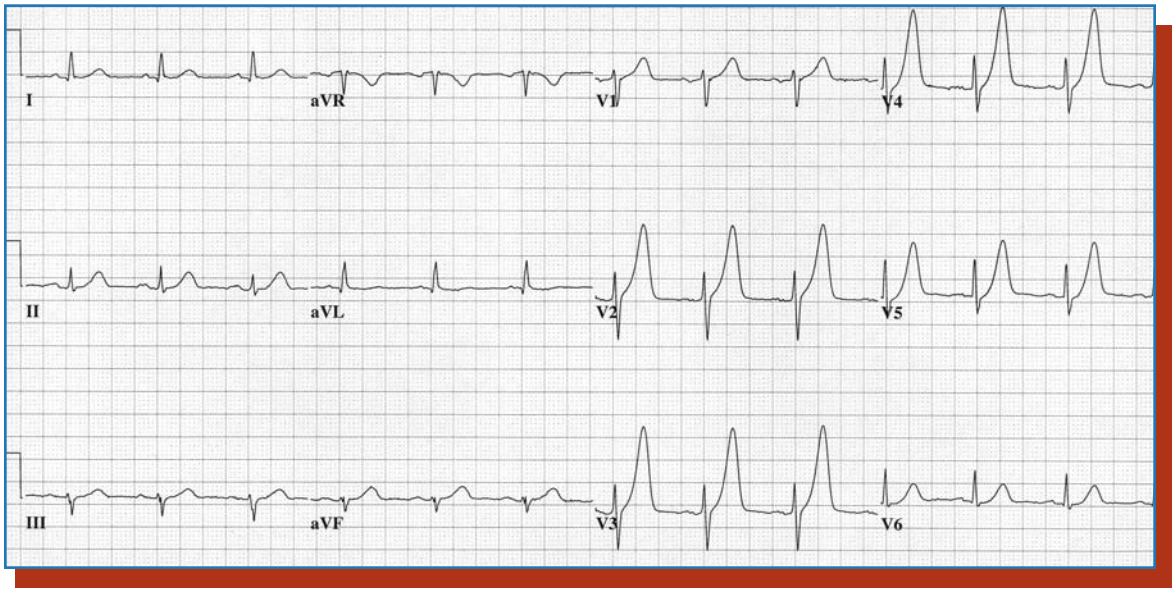

Figure 1. ECG.

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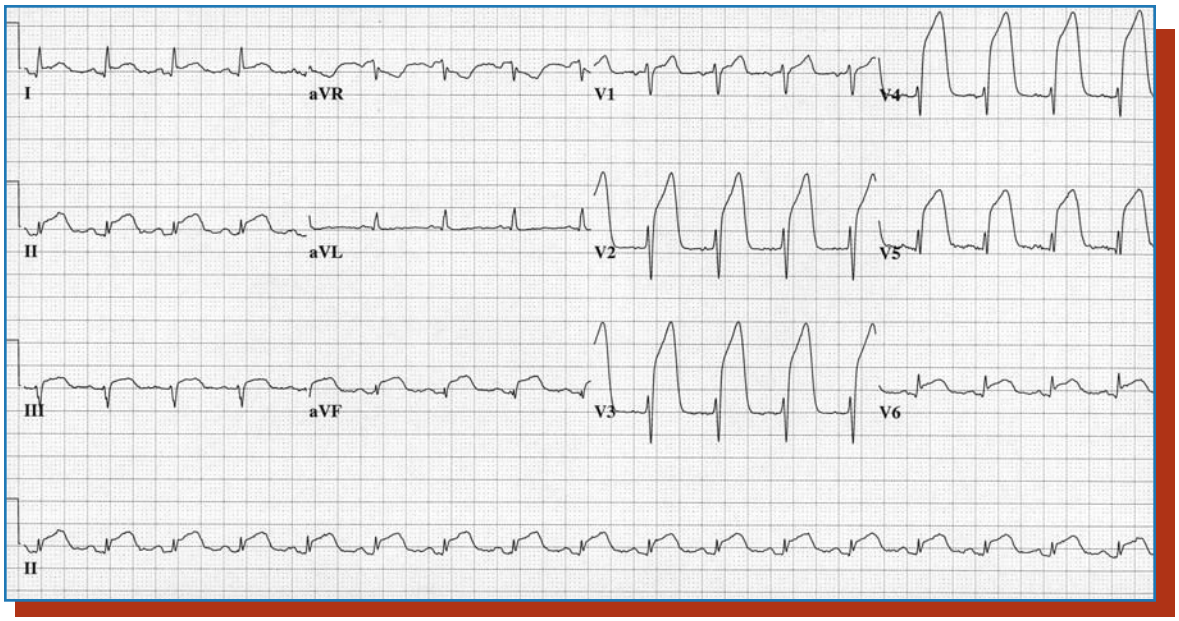

Figure 2. ECG one hour later.

exceed 5 mm in the limb leads and 10 mm in the precordial leads.

T wave changes are often non-specific and the differential diagnosis of peaked T waves, as seen in this case, includes hyperkalemia, normal variant early repolarization due to vagotonia, and "hyper-acute" subendocardial injury. Hyperkalemia will usually cause more widespread T wave peaking, while early repolarization is more commonly seen in younger individuals and is, generally although not invariably associated with some degree of ST segment elevation. In a patient presenting with chest pain, the localization of these changes to a single vascular territory should prompt concern about the possibility of a very early acute anterior myocardial infarction (MI). In ths case, this was confirmed by recording an ECG less than an hour later, when the patient complained of recurrent, severe pain (Figure 2). The development of diffuse, dramatic ST segment elevation indicates an extensive acute anterior MI. Acute angiography confirmed an occlusion of a large left anterior descending coronary artery which, following reperfusion therapy, was shown to extend well beyond the left ventricular apex and supply the distal half of the inferior wall. This accounts for the extensive ECG changes, which appear to involve more than one coronary artery territory. Dx