Elderly patient with tachycardia and hypotension

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Vignette

The electrocardiogram shown in Figure 1 was taken in an 88-year-old woman brought to the emergency department with tachycardia and hypotension.

Questions
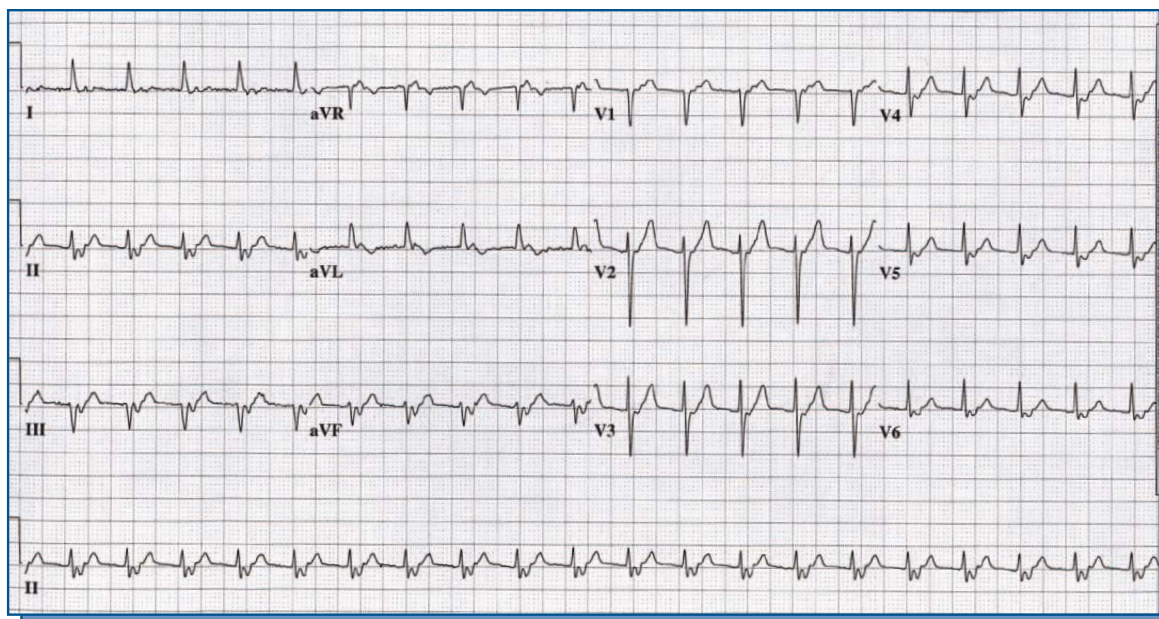
What is your electrocardiographic diagnosis?

Figure 1

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ECG CLINIC

Answer

The rhythm strip at the bottom of the electrocardiogram shows a tachycardia of 122 beats per minute, and on first look the QRS complexes appear wide and with no P waves preceding them. However, reference to the simultaneous recording of other leads discloses an unusual irregularity of the ST segment immediately after narrow QRS complexes. It is shown as a negative deflection on leads II, III and aVF, and as positive deflection in leads aVR and aVL. It is the missing P wave, keeping an inverted polarity and a reversed sequence with the QRS complex.

An explanation for the inverted P wave polarity, as well as for the reverse sequence of atrial and ventricular activation, is that in each cardiac cycle depolarization originates somewhere in the junctional region but reaches the ventricles first. Older electrocardiographic literature referred to this rhythm as "low AV nodal" or "low junctional," qualified as "paroxysmal tachycardia" because of sudden onset and rapid rate. More recently, it has been demonstrated that the actual mechanism of this arrhythmia is *re-entry* within the atrioventricular node or through atrioventricular accessory pathways, and is usually included in the group of paroxysmal SVTs. The tachyarrhythmia episodes may be terminated by carotid sinus stimulation or the use of drugs, such as adenosine and verapamil. Dx