

ECG quiz

KW Lam

Case history

A young man of 19 years old attended the Accident and Emergency Department (A&E) because of palpitation for 2 days. There was no dizziness, shortness of breath, and chest pain. He had history of palpitation since early teenage which he did not seek medical opinion. Examination was essentially

normal, except a regular pulse rate of 180 per minute. Blood pressure was 125/79 mmHg. An ECG was done which was shown in Figure 1.

Question

What was the diagnosis?

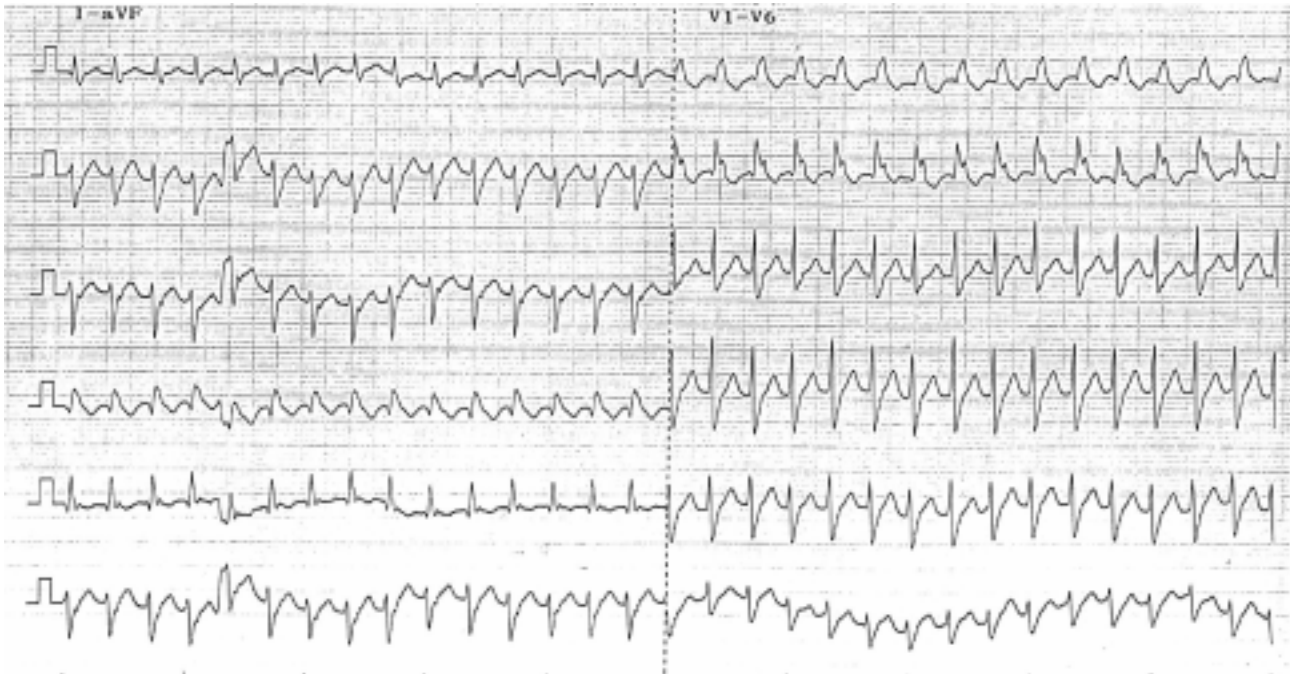


Figure 1.

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Answer

Fascicular ventricular tachycardia (VT with RBBB and left superior axis).

Discussion

Wide complex tachycardia is commonly encountered and often present diagnostic challenges to emergency physicians. Although a lot of criteria have been described to help differentiating VT from SVT with aberrant conduction, misdiagnosis is still common.¹

Ventricular tachycardia is commonly associated with underlying heart diseases. However, up to about 15% of VTs are idiopathic,² that is, occurring in patients without structural heart disease, metabolic/electrolyte abnormalities, or the long QT syndrome. Recent experiences showed that there are several distinct forms of idiopathic VT. They are classified according to the ventricle of origin, the response to pharmacologic agents, evidence for catecholamine-dependence, and the morphologic features (QRS configuration and axis).³

Fascicular VT is one of the several forms of idiopathic ventricular tachycardias. It has several distinctive features:

1. It usually presents in patients between 15 and 40 years old with no structural heart disease.³ Although some author reported a false tendon or fibromuscular band that extends from the posteroinferior left ventricle to the basal septum,

- the specificity of such findings remains unclear.^{3,4}
2. Sudden cardiac death is rare, although at least one possible case has been reported.³
 3. It usually originates in the region of the left-posterior fascicle and hence the characteristic RBBB morphology and left superior axis.³
 4. RS interval (measured from the beginning of the R wave to the nadir of S wave) is 60-80 ms and the QRS duration is no more than 140 ms. RS interval greater than 100 ms suggest VT associated with structural heart disease.^{3,4} Our patient had a RS interval of about 60 ms and a QRS duration of about 100 ms. (Figure 2)
 5. The resting ECG in most patients is normal. But in some patients, there may be nonspecific transient inferolateral T-wave changes,^{3,4} as in our patient. (Figure 3)



Figure 2.



Figure 3.

6. Unlike VT originating from right ventricular outflow tract (RVOT), which is another form of idiopathic VT, it does not respond to adenosine and vagal maneuvers.³
7. Fascicular VT is unresponsive to the typical drug treatments for VT associated with coronary heart disease, such as lignocaine or propranolol.⁴
8. Fascicular VT is responsive to Verapamil.^{3,4} However Elswick and Nieman suggested that emergency physicians should exercise caution in treating patients with wide complex tachycardia by giving Verapamil. Opinion of a cardiologist should be sought.⁴
9. In patients with severe symptoms, results of radiofrequency ablation are excellent.³

References

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4. Elswick BD, Niemann JT. Fascicular ventricular tachycardia: an uncommon but distinctive form of ventricular tachycardia. *Ann Emerg Med* 1998;31(3): 406-9.