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ENDGAMES

SPOT DIAGNOSIS

A young man with palpitations and pre-syncope

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A 20 year old man presented to the emergency department with palpitations lasting half an hour. He was also feeling dizzy and felt close to fainting. He denied any chest pain. He had no known cardiac history.

Examination revealed blood pressure of 70/50 mm Hg. Oxygen saturation was 91% on room air. There was no murmur on auscultation of the chest. The man underwent electrocardiography (ECG) (fig 1). What rhythm does the ECG show?

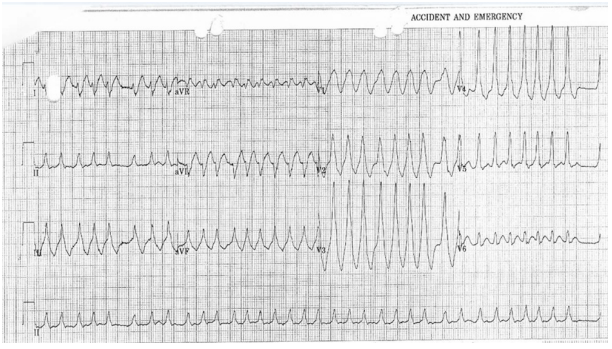

Fig 1 Electrocardiography (ECG) on presentation to the emergency department

Short answer

Atrial fibrillation with very fast ventricular response as a result of antegrade conduction through an accessory pathway (pre-excited atrial fibrillation) (fig 2).

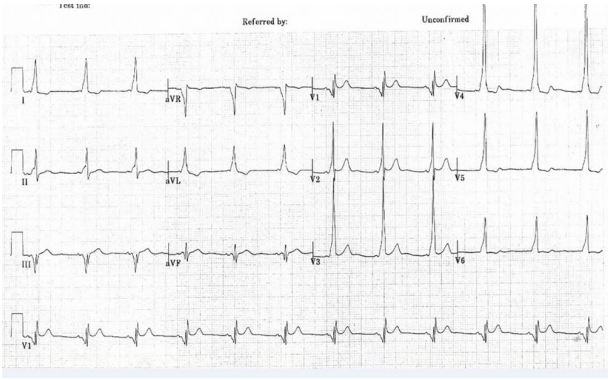

Fig 2 Resting ECG showing pre-excitation

Discussion

This is irregular wide complex tachycardia at an average ventricular rate of 212 beats/min. The differential diagnoses are atrial fibrillation with antegrade conduction through an accessory pathway, atrial fibrillation with bundle branch block, and polymorphic ventricular tachycardia. Torsade de Pointes is unlikely in view of the fact that there are no progressive changes in the QRS axis during tachycardia. There is beat-to-beat variation in the QRS morphology and this is unlikely to happen with atrial fibrillation and bundle branch block. Furthermore, the QRS morphology does not conform to any typical right or left bundle branch block.

When the ventricular rate is relatively slower, the rhythm is overtly irregular, which is suggestive of background atrial fibrillation. The QRS complex with beat-to-beat variation in morphology can be explained by the varying amount of fusion from atrioventricular nodal and accessory pathway conduction.

Manifest accessory pathways occur in 0.1%-0.3% of the population. Although atrial fibrillation can occur in almost one third of patients with Wolfe Parkinson White syndrome, presentation with pre-excited atrial fibrillation is rare and can lead to a malignant ventricular arrhythmia and sudden death.

Intravenous procainamide or ibutilide (not available in the UK) can be used to stop atrial fibrillation and block accessory

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pathway conduction if the patient is haemodynamically stable. Direct current cardioversion is indicated to terminate the arrhythmia if there is haemodynamic compromise. Patients with pre-excited atrial fibrillation should not be treated with digoxin, amiodarone, diltiazem, verapamil, or β blockers because of the possibility of precipitating a life threatening ventricular arrhythmia.

The definitive treatment is electrophysiology study and ablation of the accessory pathway (fig 3).

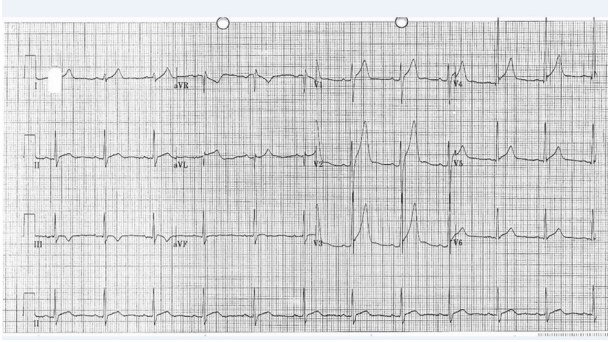

Fig 3 Post ablation ECG showing no pre-excitation

Learning points

1. Pre-excited atrial fibrillation is an uncommon but serious arrhythmia, which needs rapid diagnosis and appropriate treatment. The patient can present with palpitations, dizziness, and syncope. It is also a rare cause of sudden death. ECG will show irregular wide complex tachycardia. Intravenous procainamide or ibutilide can be used to stop atrial fibrillation and block accessory pathway conduction. Direct current cardioversion is a safer alternative to treat the arrhythmia, particularly if there is haemodynamic compromise.

2. Patients with pre-excited atrial fibrillation should be discussed with the cardiologist/electrophysiologist for urgent ablation in view of its associated risk of sudden death.

I have read and understood the BMJ policy on declaration of interests and declare that I have no competing interests.

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