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Case report

Potentially misleading manifestation of a ventricular pre-excitation☆

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ABSTRACT

We present the case report of a 56-year-old man with an unusual manifestation of an accessory pathway. Failure to detect, or incorrect diagnosis, of this anomaly could have put the patient at high risk of sudden cardiac death. The accessory pathway described in this case report was located at the left posteroseptal area and presented initially with a broad QRS complex tachycardia. Despite being pre-excited atrial fibrillation, it could have been misinterpreted as ventricular tachycardia. Once the rhythm had changed to sinus, a Q-wave in the inferior ECG leads became apparent. This finding could have been misdiagnosed as an old myocardial infarction and treated as such, including prescription of betablockers which might, in theory, increase the risk of sudden cardiac death. The treatment of choice for the patient was radio frequency ablation of the accessory pathway.

Introduction

Accessory atrioventricular (AV) pathways represent a presence of abnormal conductive tissue between atria and ventricles. They can be clinically completely asymptomatic, but on the other hand the abnormal accessory AV conductivity may result in narrow or broad complex tachycardia. In the latter case the diagnosis may be less obvious and the electrocardiogram (ECG) can be misinterpreted. We present the case report of one of these manifestations to stress out the need for carefully set diagnosis.

Case description

A 56-year-old man was admitted to the cardiology department with a 2-day history of exertional shortness of breath, weakness and fatigue. He also developed central chest discomfort (pressure) and presented to the accident and emergency (A&E) department 2 hours later. He denied having any palpitations or collapse. He was an ex-smoker who stopped smoking 5 years ago and his past medical history comprised of arterial hypertension and chronic allergic alveolitis. His medications included losartan 50 mg/D,

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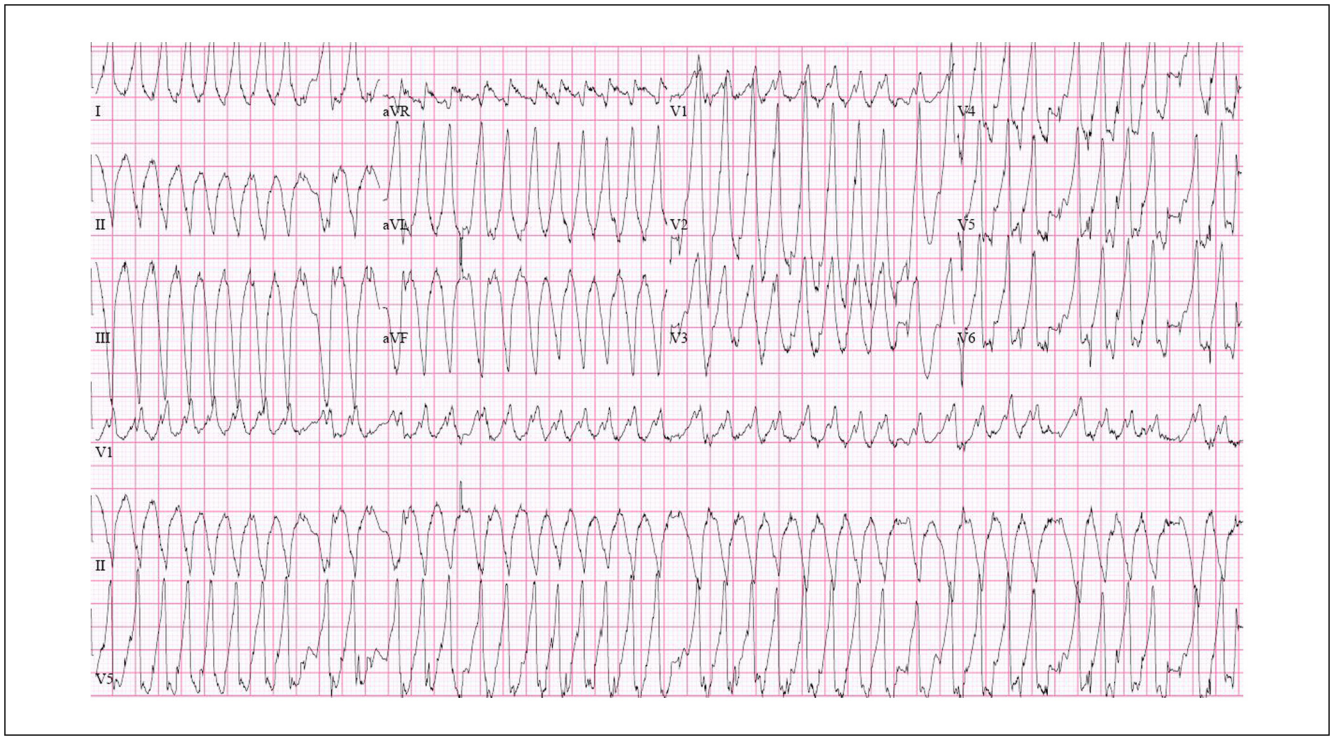

Fig. 1 – ECG on admission. Irregular broad complex tachycardia, positive concordancy + LAH morphology: pre-excited atrial fibrillation with rapid ventricular response, shortest pre-excited RR interval 200 ms.

prednisolon 20 mg/D and salicylic acid 100 mg/D. He was on a low fat diet due to hypercholesterolaemia. He had a positive family history of a premature ischaemic heart disease (his father died from myocardial infarction at 60). On admission, he was haemodynamically stable with no signs of heart failure, BP was 120/70 mmHg and heart sounds were irregular 230 beats per minute with the peripheral pulse deficit. The pressure chest pain eased off completely with sublingual nitrate. ECG on admission (Fig. 1) showed irregular broad-complex tachycardia (BCT) with positive concordancy in precordial leads, left axis deviation (LAH) and a ventricular rate of approximately 250 beats/min. The tachycardia was initially slowed down by i.v. amiodarone 300 mg but, as he remained tachycardic he was cardioverted to sinus by synchronized electrical cardioversion. The subsequent ECG (Fig. 2) showed sinus rhythm with varying QRS width and Q wave pattern in leads III and aVF. No previous ECG was available for comparison. Blood results were unremarkable with no electrolytes abnormalities, normal thyroid function test and normal creatine kinase (including MB fraction). Troponin T was slightly elevated. Transthoracic echocardiography was carried out and revealed well maintained left ventricular systolic function with mild multifocal regional wall motion abnormalities and moderate mitral regurgitation.

What is the diagnosis?

On detail ECG analysis we can see a broad complex tachycardia which could be misinterpreted as ventricular tachycardia (VT), but the obvious irregular rhythm indicates that the correct diagnosis is pre-excitated atrial fibrillation with an antegradely conducting accessory pathway (Fig. 1). Shortest pre-excited RR interval 200 ms indicates high-risk accessory pathway (very fast antegrade conduction via accessory pathway with risk of degeneration to ventricular fibrillation). The varying QRS width on ECG after electrical cardioversion is caused by pre-excitation including Q wave pattern in the inferior leads which is in fact a negative delta wave. Pre-excitation is more expressed with atrial premature beats (Fig. 2).

This patient underwent an electrophysiology study which confirmed the presence of the atrioventricular accessory pathway in the left posteroseptal region (antegrade conduction – atrial effective refractory period/ERP/240 ms, accessory pathway ERP $<$ 260 ms, AV re-entry tachycardia non-inducible). The pathway was successfully ablated (Fig. 3) with no further ECG evidence of pre-excitation (Fig. 4).

Discussion

Accessory atrioventricular pathways are congenital abnormalities involving the presence of abnormal conduction tissue between the atria and the ventricles which can cause early depolarisation of the ventricular myocardium: pre-excitation.

The first suggestion of the existence of these pathways was mentioned by Holzmann and Scherf in 1932 [1]. Until 1932 the presence of a broad QRS complex associated with paroxysmal tachycardia was categorized as a bundle-branch block phenomenon [2,3]. First histological evidence of accessory pathway was proved in 1942 by Wood et al. [4]. David Scherf