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Anomalous origin of right coronary artery from left sinus of Valsalva in a patient presenting with syncope, ventricular tachycardia and electrocardiographic early repolarization pattern.

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Brief title: Anomalous origin of right coronary artery.

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Anomalous aortic origin of right coronary artery (AORCA) with a malignant course between the aorta and pulmonary artery is a rare congenital abnormality which carries increased risk of sudden cardiac death (SCD). However identification of patients at the highest risk of potentially lethal arrhythmias remains challenging [1]. Syncope may be a first manifestation of AORCA especially in patients with interarterial compression of right coronary artery [2].

We present the case of 62 year old patient who was referred to the cardiology clinic following an episode of syncope. He is a very fit person who runs about 20 miles a week. He has never complained of chest pains, palpitations or any exertional symptoms. The syncopal episode occurred when he was on a gentle walk. There was transient loss of consciousness with complete recovery after only a brief period of confusion. He was assessed by neurologist and reassured with normal MRI of brain and EEG. Twelve lead ECG showed sinus rhythm 47 beats per minute, first degree atrio-ventricular block and early repolarization pattern (ERP) -ST elevations in leads V3-V6 and terminal QRS notching in V6 (Fig 1. A). Transthoracic echocardiogram was normal. Treadmill exercise test was performed according to Bruce protocol. The patient exercised for 16 min 9 sec achieving maximum heart rate of 151 beats /minute. There were no symptoms or ECG changes. Twenty four hour ambulatory ECG monitoring did not reveal any significant arrhythmias and cardiac loop recorder was implanted. The patient remained asymptomatic however interrogation of the recorder on routine follow-up visit revealed the nocturnal episode of non-sustained ventricular tachycardia (Fig.1 B). Coronary computed tomographic angiography (CCTA) was performed which showed right coronary artery originating from left sinus of Valsalva with malignant course between the aorta and pulmonary artery (Fig 1.C,D). It is likely that the syncope was caused by ventricular arrhythmia triggered by compression of right coronary artery and following the current guidelines the patient was referred for surgery [3].
Interestingly in the case presented here AORCA coexisted with ERP. ERP is a common ECG finding occurring in up to 10% of general population. It may be a normal ECG variant in athlete patients. However small fraction of individuals with ERP are at risk of SCD. History of syncope suggestive of arrhythmogenic pathogenesis raises suspicion of malignant form of ERP. ERP is considered as a marker of arrhythmogenesis that requires proarrhythmic trigger [4]. It is possible that in our case transient ischemia caused by interarterial compression of right coronary artery precipitated an arrhythmia. Our case supports data from literature about the limited value of stress testing in risk stratification in patients with AORCA [5]. Further research is required to evaluate the ERP as a potential ECG marker of SCD in patients with anomalous origin of coronary artery.

References


Figure 1.

A. Twelve lead ECG

B. Ventricular tachycardia recorded by implantable loop recorder
C, D. CCTA. Right coronary artery (arrow); AO - aorta; PA - pulmonary artery;

RVOT - right ventricular outflow tract