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Single Coronary Artery: Anomalous Origin of Right Coronary Artery from Left Anterior Descending Artery

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Coronary artery anomalies occur infrequently, but can have major clinical consequences. Therefore, it is important to identify these abnormalities and determine their clinical relevance to allow institution of appropriate treatment. Origin of the right coronary artery from the left sinus or left anterior descending coronary artery may produce significant cardiac dysfunction that can be fatal [1]. The congenital absence of the ostium of the right coronary artery in the right sinus of Valsalva with the origin of the right coronary artery as a branch of the left anterior descending artery is an extremely rare variant of the single coronary artery. Here we report this anomaly in a patient who presented with worsening angina pectoris.

A 70-year-old male presented with exertional angina pectoris. His medical history comprised of hypertension, dyslipidaemia, diabetes mellitus and benign prostatic hypertrophy. He had a 60 pack smoking history and an echocardiogram, which revealed a left ventricle ejection fraction of 55 % and diastolic dysfunction. Exercise treadmill testing with myocardial perfusion imaging with thallium-201 revealed an inferoapical defect. Selective left coronary angiogram resulted in the diagnosis of single coronary artery with right coronary artery originating from the left descending artery (Fig. 1). An injection into the right sinus of Valsalva revealed no coronary ostium. Ascending aortogram confirmed that only single coronary artery arose from the left sinus of Valsalva. There was no coronary stenosis. The patient was referred for correction of the coronary anomaly.

The common coronary anomalies are single coronary artery, both coronary arteries from the right sinus of Valsalva, and left anterior descending coronary artery from the right sinus of Valsalva. A single coronary artery is present if the entire coronary system originates from a solitary ostium in the aorta. Anomalous right coronary artery arising from the left anterior descending artery is an exceedingly rare type of the common coronary artery [2–10]. Origin of right coronary artery from the left sinus of Valsalva or left anterior descending coronary artery can lead to myocardial ischaemia, which commonly occur during or immediately after exercise even in absence of atherosclerosis. Exercise leads to expansion of the aortic root and pulmonary trunk leading to external coronary artery expression and may increase the preexisting angulations of the coronary artery takeoff, with reduction in the luminal diameter in the proximal portion of the anomalous right coronary artery [1]. The clinical presentation of a patient with coronary anomalies may be angina pectoris or syncope, especially following exercise. Recognition of coronary anomalies is important in these patients as the surgical correction, if possible, will be curative. Although majority of cases with coronary anomalies have been diagnosed at autopsy, more cases are now diagnosed *ante mortem* because of the frequent use of cardiac catheterisation, transoesophageal echocardiography, ultrafast computed tomography, and magnetic resonance imaging.

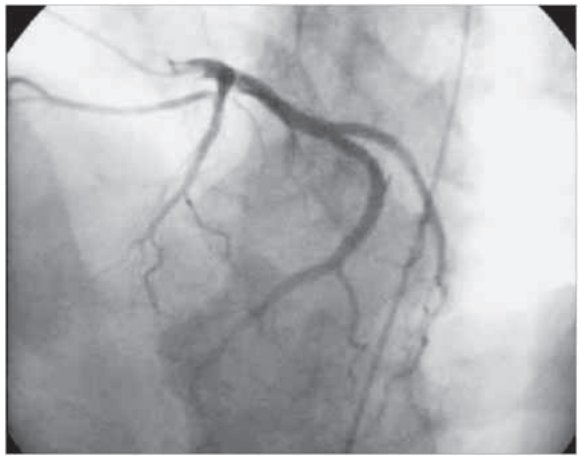

Figure 1: Coronary angiography shows origin of right coronary artery from left anterior descending coronary artery

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