Left circumflex artery supplying the territory of right coronary artery: an extremely rare variant of a congenital single coronary artery

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DESCRIPTION

A 68-year-old woman presented with exertional retrosternal chest pain with radiation to the left arm, of 1-week duration. Medical history revealed a history of bronchial asthma. Family history was negative for heart disease. The patient's blood pressure was 138/80 mm Hg and her heart rate was 68 bpm. Cardiovascular and chest examination were unremarkable. A resting electrocardiogram displayed normal sinus rhythm without any ST-segment abnormalities. Transthoracic echocardiography demonstrated normal biventricular function and normal regional wall motion. Treadmill test was positive for inducible ischaemia at low workload. Laboratory testing was unremarkable. Coronary angiography showed a left anterior descending coronary artery (LAD) arising normally from the left coronary sinus with diffuse proximal and mid-LAD calcific disease with maximum 80% stenosis (figure 1). The left circumflex artery (LCX) was the dominant vessel with its terminal branch supplying the territory of the right coronary artery (RCA) (figures 2 and 3). We failed to cannulate the RCA ostium, therefore aortic root angiography was performed to exclude an atypical take-off of the RCA. However, the RCA was not visualised on aortic root angiography (figure 4). This case thus described an extremely rare anomaly of a congenital single coronary artery (SCA) with RCA arising from a terminal extension of the LCX. The patient was managed with rota-ablation using percutaneous

Figure 2 Left coronary artery angiogram, AP caudal view, showing RCA territory (white arrow) supplied by terminal extension of LCX (black arrow). AP, anteroposterior; LCX, left circumflex artery; RCA, right coronary artery.

coronary transluminal angioplasty and stenting of the LAD. She was relieved of angina postprocedure. A SCA is an extremely rare congenital anomaly with an incidence of only 0.024% to 0.066% in the general population.¹ The clinical significance of SCAs is not clear and it is generally considered to be benign. However, there are reports suggesting its association with cardiac ischaemia, cardiomyopathy, sudden cardiac death and congestive heart failure, even in the absence of atherosclerosis.^{2 3}

Figure 1 Left coronary artery angiogram showing a normally arising LAD with a significant lesion in mid-LAD (arrow). LAD, left anterior descending.

Figure 3 Left coronary artery angiogram, LAO cranial view, showing distal LCX (black arrow) continuing as RCA (white arrow). LAO, left anterior oblique; LCX, left circumflex artery; RCA, right coronary artery.

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Figure 4 Non-selective injection in the right coronary sinus (A) and non-coronary sinus (B). Note that the RCA is not visualised. However, the left coronary artery is seen arising from the left coronary sinus (arrow), establishing the diagnosis of a single coronary artery. RCA, right coronary artery.

Learning points

- ▶ A single coronary artery (SCA) is a very rare coronary anomaly with incidence of only 0.024% to 0.066% in the general population.
- ▶ Although generally considered to be benign, SCAs have been associated with cardiac ischaemia, congestive heart failure and sudden cardiac death even in the absence of atherosclerosis.
- ▶ The absence of the right coronary artery (RCA) with the origin of the RCA arising from the distal circumflex artery is an extremely rare variant of SCAs. The incidence of this anomaly is unknown, with only a few cases reported previously.

Competing interests None declared.

Patient consent Obtained.

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