Images in Cardiology

Anomalous Right Coronary Artery Arising From Distal Left Circumflex Artery

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Single coronary artery (SCA) is a rare congenital anomaly in which the cardiac myocardium is supplied by a coronary circulation arising from a single ostium off of the aorta. SCAs are commonly classified according to the Lipton classification system, and the incidence appears to range between 0.014% and 0.066%.^{1,2} Presentations of patients with SCA include detection as an incidental finding on angiography, atypical chest pain, typical chest pain thought to be secondary to spasm or decreased blood flow, and typical chest pain with atherosclerosis requiring percutaneous intervention or bypass grafting.^{1,3,4} We report the case of a 62-year-old man with obstructive sleep apnea, obesity, and prediabetes (A1c: 6.3%) who was sent for evaluation of coronary disease, owing to a strong family history, after a stress echocardiogram showed

antero-lateral ischemia. He had denied any cardiac symptoms, including angina, orthopnea, paroxysmal nocturnal dyspnea, and palpitations. Given the family history of sudden cardiac death and early coronary disease, he was sent for CT coronary angiography (CTCA), which showed a calcium score of 17 using the AJ 130 method (39th percentile for age, sex, and race), and no significant obstructive epicardial artery disease was seen. However, the CTCA demonstrated an SCA arising from the left coronary cusp, with the right coronary artery arising as a terminal extension of the circumflex artery in an L1 modified Lipton classification (Fig. 1A). This finding was confirmed with conventional angiography showing the SCA and nonobstructive coronary disease (Fig. 1B). Reassuringly, his particular SCA demonstrated TIMI (from Thrombolysis

Figure 1. (A) A reconstructed computed tomography model showing single coronary artery, with a right coronary artery (arrow) arising off of the distal left circumflex (LCx) with congenitally absent right coronary ostium. (B) Conventional radial angiography of the left coronary circulation demonstrates the single coronary artery anatomy seen on the computed tomography image.

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Ethics Statement: This article adheres to the ethical framework set out by Queen's University and written permission was obtained from the patient whose information is presented in the above article.

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See page 113 for disclosure information.

Novel Teaching Points

- SCAs are rare congenital anomalies that are often incidentally diagnosed.
- CTCA can provide anatomic detail and 3-dimensional orientation beyond that of conventional angiography.
- CTCA can be useful in understanding complex congenital anomalies, including their anatomic relationship to nearby structures.

in Myocardial Infarction) grade 3 flow and was not associated with other structural heart disease, as can sometimes be the case.⁴ In this case, we interpreted the echocardiogram as being a false-positive study, as there was no evidence of flow-limiting coronary disease, and so the patient was managed medically with blood pressure control, statin, and single antiplatelet therapy. Although angiography was performed because of a positive stress echocardiogram, CTCA is an ideal technique to characterize SCA anomalies and to noninvasively identify epicardial coronary anatomy in select patient populations.⁵

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