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Single right coronary artery with absence of the left main coronary artery, left anterior descending artery, and circumflex artery

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Single coronary artery is an extremely rare congenital coronary anomaly in which the entire coronary arterial system arises from a solitary ostium. The Lipton's classification is used for single coronary artery anomalies. Herein, we present a 72-year-old woman with single coronary artery anomaly admitted with atypical chest pain. Coronary angiography and multidetector computed tomography coronary angiography findings were shared.

KEYWORDS
anomalous coronary arteries, cardiac imaging, chest pain, computed tomography (CT), coronary arteries, right coronary artery

A 72-year-old woman was admitted with atypical chest pain. Echocardiography was normal except mild mitral regurgitation. There was no coronary angiography revealed a single right coronary artery (RCA) arising from the right sinus of Valsalva (Figure 1A,B). Well-developed branches of the posterior descending artery (PDA) and posterolateral artery (PLA) supplied the left ventricle. The distal third of the septum was supplied by the PDA turning upward from the cardiac apex. There was no significant stenosis at the RCA, PDA, and PLA. The left main coronary artery (LMCA), left anterior descending artery (LAD), and circumflex artery (Cx) could not be visualized. No coronary artery arising from the left sinus of Valsalva was seen. Multidetector computed tomography coronary angiography revealed absence of the LMCA, LAD, and Cx (Figure 2A–D). Additionally, a small caliber artery arising from the proximal portion

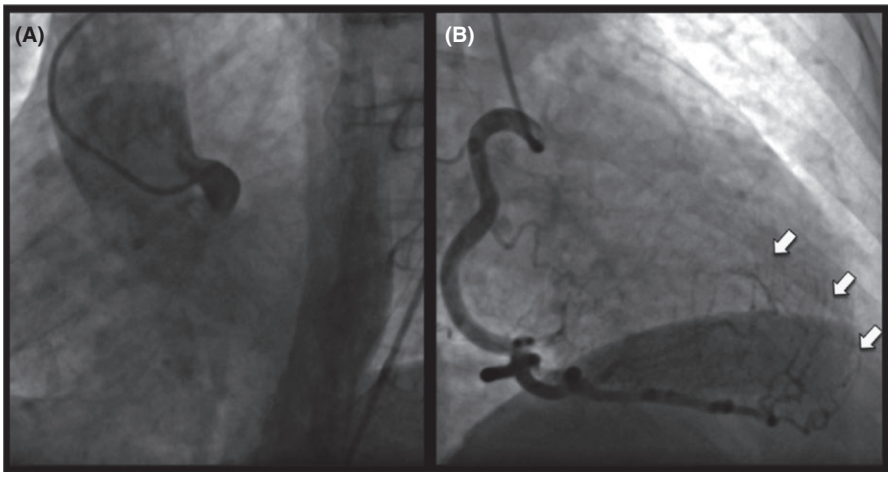

FIGURE 1 A. Aortography shows absence of any left coronary artery filling from the left sinus of Valsalva. B. A single right coronary artery supplies the entire coronary arterial circulation with well-developed branches (arrows)

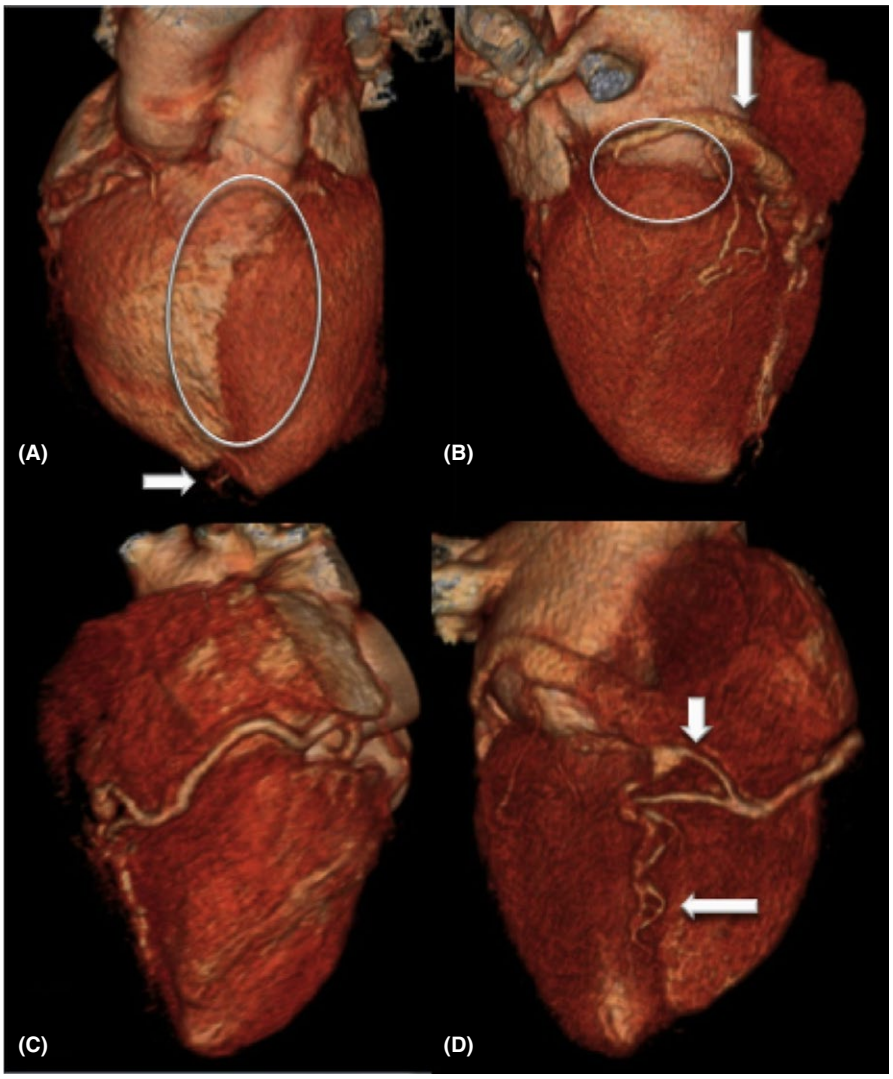

FIGURE 2 A. Volume-rendered image shows absence of the left anterior descending coronary artery (ellipse). The posterior descending artery turning upward from the cardiac apex supplies the distal third of the septum (arrow). B. Circumflex artery is also absent (ellipse), and the sinus coronarius is the only vessel at the atrioventricular groove (arrow). C. A single right coronary artery arises from the right coronary sinus of Valsalva. D. Well-developed posterolateral (short arrow) and posterior descending (long arrow) artery are seen

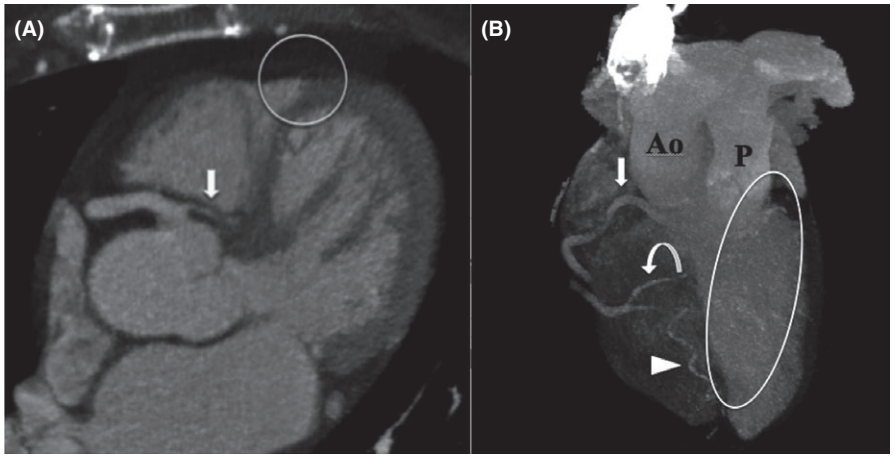

FIGURE 3 A. Multiplanar reconstructed image reveals a small caliber artery arising from the proximal segment of the right coronary artery and coursing to the basal interventricular septum (arrow). The left anterior descending artery is absent at the anterior interventricular groove (circle). B. MIP image of the coronary tree shows the single right coronary artery (arrow). The left anterior descending artery is absent at the anterior interventricular groove (oval). Ao = aorta; P = pulmonary artery; curved arrow = posterolateral artery branch of the right coronary artery; arrowhead = posterior descending artery branch of the right coronary artery

of the RCA and coursing to the basal interventricular septum was detected (Figure 3A,B). Single coronary artery (SCA) is an extremely rare congenital coronary anomaly in which the entire coronary arterial system arises from a solitary ostium.[1] The Lipton's classification is used for single coronary artery anomalies.[2] The R and L symbolize the origin of the SCA as the right and left sinus of Valsalva, respectively. Then, the course of the anomalous coronary artery is indicated: group I symbolizes an anatomical course of either a right or left coronary artery; group II symbolizes one coronary artery arising from the proximal part of a normally located coronary artery; and group III symbolizes the condition where the LAD and Cx arteries arise separately from the proximal part of the normal RCA. Finally, the course of the anomalous artery in relation to the great vessels is indicated as: A (anterior), P (posterior), B (interarterial course between the aorta and the pulmonary artery), S (through the interventricular septum), and C (a combination of diverse routes). The type B is important as it carries the highest risk of sudden death.[3] This case brings out a new coronary artery variation, and it may be a new subtype of the Lipton R-I. Although recurrent ischemia, acute infarction, syncope, and ventricular fibrillation may be seen, most of the SCA patients are asymptomatic. Although it is usually benign course, interventionist and cardiovascular surgeon should be familiar with the existence and detailed anatomical description of the SCA.

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