

Single Coronary Ostium in Right Coronary Sinus:

Previously Unreported “One for All” Configuration

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We report our identification of a single coronary ostium arising from the right coronary sinus of Valsalva, in a 63-year-old woman who presented with chest pain atypical of angina. Coronary angiograms showed that the left anterior descending coronary artery arose from a right ventricular branch and that the left circumflex coronary artery arose from a right posterolateral branch. Both arteries reconstituted themselves in a backward fashion from the apex to the base of the heart—a configuration that to our knowledge has not been reported. The patient was treated conservatively and reported no chest pain 24 months later. (Tex Heart Inst J 2014;41(6):601-2)

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In May 2012, a 63-year-old woman presented with intermittent chest pain atypical of angina pectoris. After acute myocardial infarction was ruled out, results of pharmacologic myocardial perfusion scintigraphy raised the possibility of anterior-wall ischemia. Subsequent selective coronary angiograms (Fig. 1) and aortic root angiograms, supplemented by coronary computed tomographic angiograms (Figs. 2 and 3), showed unobstructed coronary vessels and a single coronary ostium that supplied the entire coronary system. All the coronary arteries were present, but several had abnormal origins and courses. A large common trunk originated from the right coronary sinus of Valsalva and followed a rightward initial course, without evidence of coronary segments coursing between the aorta and the pulmonary artery (traditionally called interarterial). The right coronary artery originated from the common trunk and coursed in the right atrioventricular (AV) groove before its terminal part, the right posterolateral branch, traveled to the posterolateral wall. This vessel then followed a posteroanterior path, giving rise to an obtuse marginal branch that traveled toward the left ventricular free wall and ended as a very small left circumflex coronary artery (LCx) in the anterior left AV groove. A large right ventricular (RV) branch originated from the proximal trunk and traveled along the RV free wall toward the RV apex, giving rise to the left anterior descending coronary artery (LAD). The LAD ascended in the anterior interventricular groove with a backward course from the apex to the base of the left ventricle. A separate coronary branch, which divided proximally from that RV branch, formed a small vessel that traveled anteriorly toward the lateral wall of the left ventricle and constituted a ramus medianus artery. This artery appeared to follow an intramyocardial path and crossed under the LAD. The basal parts of the LAD and LCx were both slender, tapering arteries that connected at their anatomic proximal ends without forming a distinct left main trunk.

Because our patient had no clear ischemia and there was no interarterial coronary course, we treated her conservatively. As of 24 months of monitoring, she was doing well.

Discussion

Shirani and colleagues¹ classified single coronary ostium into 20 categories on the basis of the ostium's location and the path of any aberrantly coursing coronary artery. Among 97 instances of solitary ostium, they described the cases of 4 patients in whom the right coronary artery gave rise to an LAD and continued to travel in the AV groove past the crux that supplied the LCx territory (type IIC). Our patient's case has characteristics of type IIC. However, to our knowledge, the pattern of backward reconstitution (apex to base) of both the LAD from the RV branch and the LCx from a distal right posterolateral branch has not been reported. Furthermore, the LAD's

crossing over the intramyocardial ramus medianus is an instance of crossing coronary arteries, an extremely rare entity in the medical literature.²

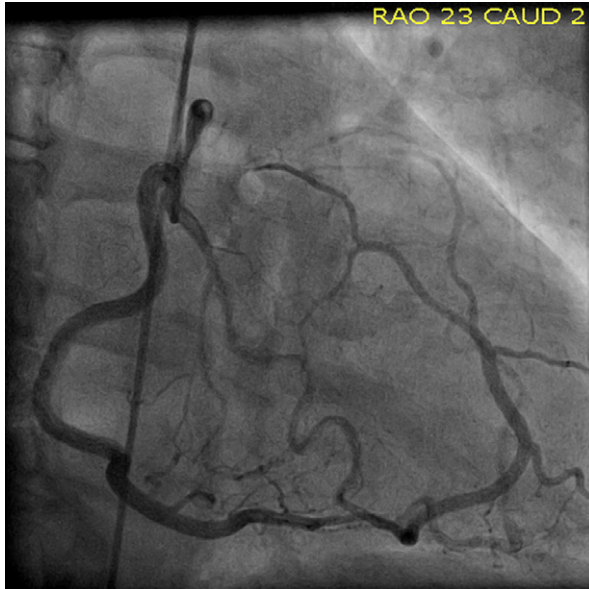


Fig. 1 Coronary angiogram (right anterior oblique view) shows a single coronary ostium arising from the right coronary sinus of Valsalva. The ostium gives rise to a common trunk that courses along the right ventricular free wall and constitutes the right coronary artery, which in turn expands to the left ventricular free wall and forms the left circumflex coronary artery. An acute right ventricular branch arises from the proximal common trunk and courses inferiorly along the right ventricular free wall before it forms the left anterior descending coronary artery, which travels in the interventricular groove.

Supplemental motion image is available for Figure 1.

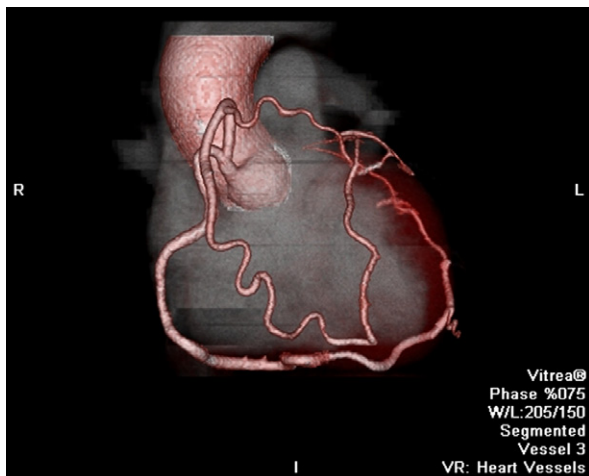


Fig. 2 Three-dimensional computed tomographic angiographic rendering (anteroposterior view) shows an entire coronary system arising from a single coronary ostium in the right coronary sinus of Valsalva.

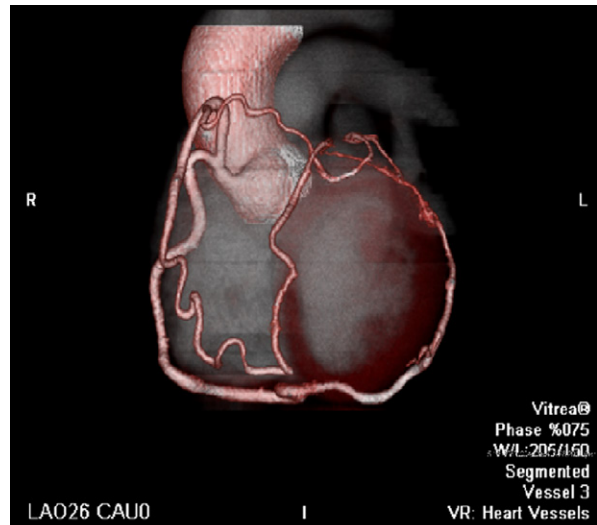


Fig. 3 Three-dimensional computed tomographic angiographic rendering (left anterior oblique view) shows a single coronary ostial system arising from the right coronary sinus of Valsalva. The ramus medianus artery arises from the right ventricular branch, travels to the lateral wall of the left ventricle, and takes a course underneath the left anterior descending coronary artery.

References

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