



Figure 1. Three-dimensional reconstruction of CT findings showing both the right coronary artery (RCA) (arrows) arising just superior to the left coronary sinus, and left main coronary artery originating from the aorta at the left coronary sinus of Valsalva. Normally, the left main coronary artery branches from the left coronary sinus of Valsalva, as shown here, but the RCA typically comes from the right coronary sinus of Valsalva. The interarterial course of the RCA can be observed between the aorta and the pulmonary artery. *L*, Left main coronary artery; *A*, aorta; *RVOT*, right ventricular outflow tract; *PA*, pulmonary artery.

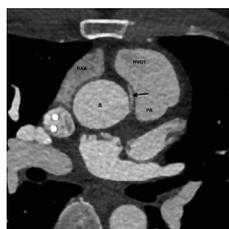


Figure 2. Axial CT at the level of the sinotubular junction, showing the RCA (arrow) between the aorta and pulmonary artery. *RAA*, Right atrial appendage.



Figure 3. Axial CT showing the RCA (arrows) coursing between the aorta and the right ventricular outflow tract. *P*, Pacer lead.

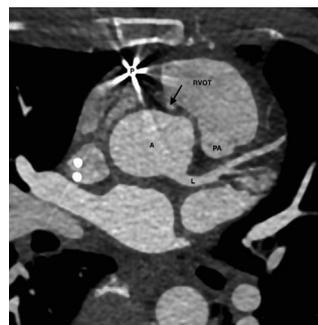


Figure 4. Axial CT more caudal from [Figure 2](#), showing partially visualized RCA (arrow) between the aorta and right ventricular outflow tract. The patient's pacemaker lead placed for sick sinus syndrome, the pulmonary artery, and the left main coronary artery can also be observed.



Figure 5. Axial CT maximum intensity projection showing the sinoatrial nodal artery (long arrow) branching from the proximal RCA (short arrows). The left main coronary artery can be observed stemming from the left coronary sinus of Valsalva. The RCA branches off from the aorta just superior to the left coronary sinus. Normally, the RCA would come from the right coronary sinus of Valsalva. The noncoronary sinus, named for its lack of coronary arteries, is also marked. *RA*, Right atrium; *RCS*, right coronary sinus; *NCS*, noncoronary sinus; *LCS*, left coronary sinus; *LA*, left atrium; *LAA*, left atrial appendage.

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A 50-year-old woman with a history of hypertension, hyperlipidemia, and sick sinus syndrome with a pacemaker presented to the emergency department (ED) for 12 hours of exertional, left-sided chest pain. Troponin I level was 0.0 ng/mL and her ECG showed an atrially paced rhythm without ST-segment changes. The patient subsequently underwent coronary computed tomography (CT) scan.

For the diagnosis and teaching points, see page e6.

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IMAGES IN EMERGENCY MEDICINE

*(continued from p. e5)***DIAGNOSIS:**

Anomalous aortic origin of a coronary artery from the opposite sinus of Valsalva, with an interarterial course. The use of coronary CT in the ED has been increasing, and emergency physicians are more likely to be responsible for findings such as anomalous aortic origin of a coronary artery,¹ which is a congenital abnormality in which the right coronary artery arises from the left sinus of Valsalva or vice versa.² There are several courses the artery can then take, but the interarterial course, between the aorta and pulmonary artery, is the most dangerous (Figures 1 to 4). During strenuous activity, dilatation of the great vessels can externally compress the interarterial artery, causing chest pain, palpitations, and syncope.³⁻⁵ Although some patients are asymptomatic, anomalous aortic origin of a coronary artery can cause myocardial infarction, sudden cardiac death, and arrhythmias.⁶⁻⁹ Symptomatic patients with anomalous aortic origin of a coronary artery with an interarterial course should receive prompt evaluation by cardiology, cardiothoracic surgery, or both.

In this case, the patient's sinoatrial nodal artery branched from the interarterial vessel and was thought to be the cause of her sick sinus syndrome (Figure 5). A subsequent exercise nuclear stress test revealed normal myocardial perfusion, leading cardiologists to believe her anginal symptoms were unrelated to this finding. No further interventions were recommended.

Author affiliations: From the Department of Emergency Medicine (Jennings, Matuskowitz) and Department of Radiology and Radiologic Science (Suranyi), Medical University of South Carolina, Charleston, SC.

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