

Acute coronary syndrome with separate right sinus origin of all three coronary arteries: diagnosis and successful left anterior descending percutaneous coronary intervention

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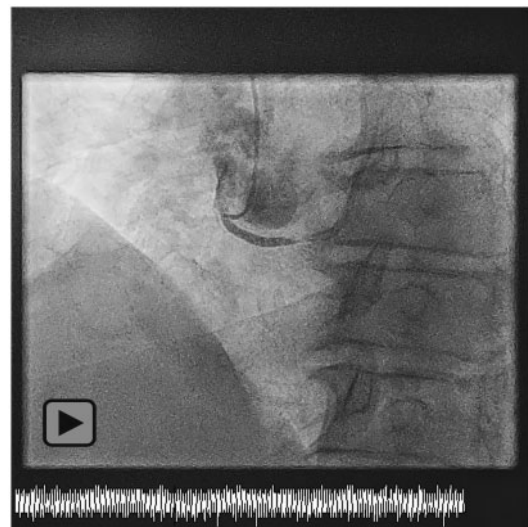
Coronary artery anomalies have incidences of 0.3 to 1.6–5.6%, in autopsy and angiographic series, respectively.¹ Percutaneous coronary intervention (PCI) to anomalously arising, culprit coronary arteries is

rarely performed.² We report PCI in the rare setting where all coronaries arise from the right coronary sinus.

A 73-year-old male, hypertensive, ex-smoker presented with acute chest pain, troponin elevation, and anterior T-wave inversion.



Video 1 Selective angiography demonstrated severe disease in an anomalous left anterior descending artery arising from the right sinus (left anterior oblique view).



Video 2 Selective angiography demonstrates unobstructed right coronary artery arising normally from the right sinus (PA cranial view).

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Video 3 Angiography of the anomalous left anterior descending artery following percutaneous coronary intervention shows good angiographic result and TIMI 3 flow (left anterior oblique caudal view).

Invasive coronary angiography revealed the absence of a coronary artery or stump in the left sinus. Aortography excluded aberrant high take-off origin of the left main stem but demonstrated vessels in the right sinus. An Amplatz-left (AL1) guide-catheter engaged an aberrant vessel originating from the right sinus with mid-vessel, subtotal occlusion (*Video 1*); the right coronary artery (RCA) was unobstructed (*Video 2*). The aberrant artery then coursed along the path of a normal left anterior descending artery (LAD) and was stented with a 3.5 × 18 mm Onyx stent (Medtronic, USA) (*Video 3*). Subsequent coronary computed tomography coronary angiography confirmed the coronary origins and courses, with anomalous origins of the LAD and a moderately diseased left circumflex artery (LCX) from separate ostia inferior to the RCA ostium, with retroaortic, non-malignant courses (*Figure 1*). Invasive angiography 2 weeks post-discharge for recurrent chest pain demonstrated a patent LAD stent and normal fractional flow reserve assessment of the LAD and LCX. The patient was maintained on medical therapy.

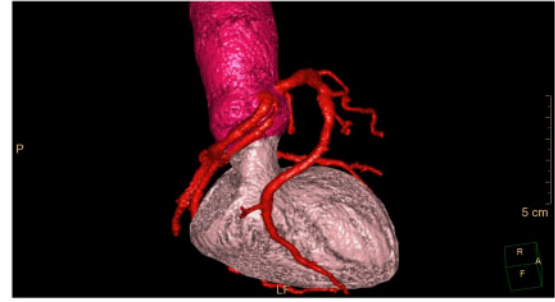


Figure 1 Three-dimensional reconstruction computed tomography coronary angiography reconstruction showing separate origins of all three coronary arteries from the right coronary sinus, with the left anterior descending and left circumflex arteries having retroaortic, non-malignant courses.

Anomalous arteries, if not visualized in the right sinus, might arise from the RCA or immediately above or below its ostium. These positions can be probed using Amplatz catheters. Non-selective angiography with the catheter above one of the ostia may delineate the other artery which may lie juxtaposed, best seen in a Right Anterior Oblique projection.

Diagnosis with non-selective angiography, and judicious catheter selection and manipulation, can optimize prompt revascularization in the time-constrained, technically challenging setting of anomalous, acute coronary syndromes.

Consent: The authors confirm that written consent for submission and publication of this case report including images and associated text has been obtained from the patient in line with COPE guidance.

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