



UNIVERSITY of
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MEDICAL CENTER

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DEPARTMENT OF IMAGING SCIENCES

Imaging Sciences Interesting Cases

CASE 35

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CLINICAL PRESENTATION: Exertional and non-exertional chest pain with positive stress test but negative EKG and echocardiogram.

IMAGING FINDINGS: The right coronary artery (RCA) origin is off the left coronary sinus. The artery traces between the aorta and pulmonary artery and right ventricular outflow tract. There appears to be compression of the proximal portion this vessel between the aorta and the pulmonary artery.

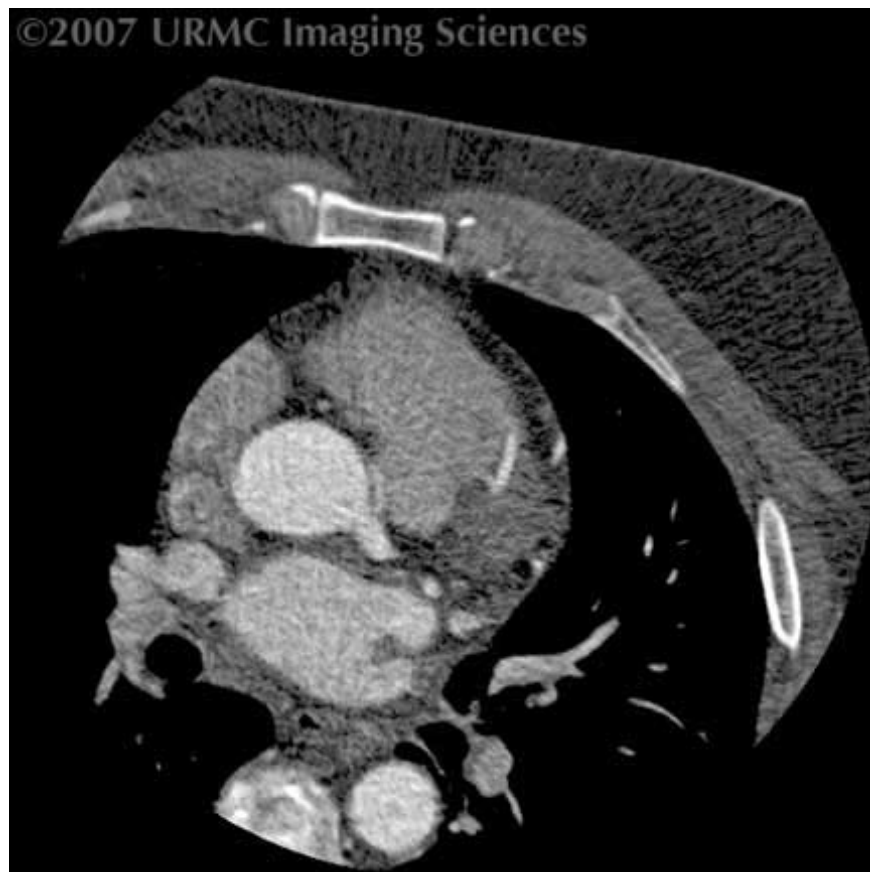


Figure 1. Axial cross-sectional images of the heart show the normal origin of the left coronary artery (LCA) from the left coronary sinus.

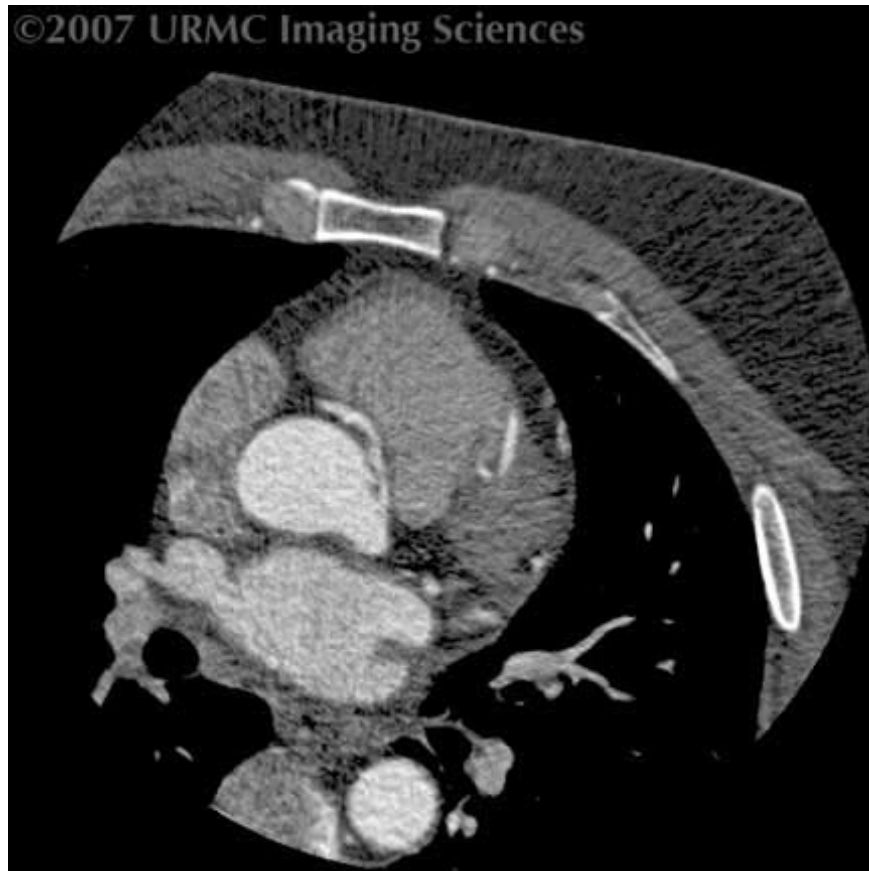


Figure 2. The ectopic RCA arises from the left coronary sinus and traverses between the aortic root and right ventricular outflow tract.

DIAGNOSIS: Anomalous right coronary artery

DISCUSSION: Coronary artery anomalies can be found incidentally in 0.3 - 1% of healthy people. Four patterns of anomalous coronary artery origins from the opposite or noncoronary sinus are recognized;

1. RCA from the left coronary sinus,
2. LCA from the right coronary sinus,
3. Left circumflex or left anterior descending artery from the right coronary sinus, and
4. LCA or RCA from the noncoronary sinus.

There are four common courses that can be taken by a coronary artery arising from the opposite or non-coronary sinus including: (a) interarterial (btw aorta and pulmonary artery), (b) retroaortic, (c) prepulmonic, or (d) septal (subpulmonic). The interarterial course carries a high risk for sudden cardiac death whereas the remaining retroaortic, prepulmonic and septal courses appear to be benign. In 0.3 - 0.17% of angiographic cases, the RCA arises from the left sinus of Valsalva as a separate vessel or as a branch of a single coronary artery. The interarterial course is the most common course of an anomalous RCA arising from the left sinus of Valsalva and can be associated with sudden cardiac death in up to 30%. It is hypothesized that when the aorta dilates during exercise, the already narrowed anomalous RCA ostium becomes narrower, limiting coronary blood flow with resultant myocardial infarction.

REFERENCES:

1. Kim SY, Seo JB, Do KH, Heo JN, Lee JS, Song JW, Choe YH, Kim TH, Yong HS, Choi SI, Song KS, Lim TW. Coronary artery anomalies: classification and ECG-gated multi-detector row CT findings with angiographic correlation. *Radiographics*. 2006 Mar-Apr;26(2):317-33; discussion 333-4. [PubMed]