

Images in Cardiovascular Medicine

A Publication of the Cardiovascular Imaging Network at Queen's

Case of the Month

Misdiagnosis of ARCAPA: A Multimodality Approach

¹Gilmour J, MD, ^{1,2}Kafka H, MD, ³Ropchan G, MD, ¹Johri AM, MD

Anomalous origin of the right coronary artery from the pulmonary artery (ARCAPA) is a rare congenital anomaly. Although there have been several cases of ARCAPA reported in the literature, we present a case which highlights the challenges of diagnosing this rare condition and the incremental value of using multiple imaging modalities. Historically, transthoracic echocardiography (TTE) and angiography have been the diagnostic imaging modalities most commonly used. We present the case of a healthy 48 year old female in which TTE, as the first imaging investigation, led to an initial provisional diagnosis of a coronary-cameral fistula. A subsequent multimodality approach, correlating images from echocardiography, angiography, CT and MRI was instrumental in confirming the diagnosis of ARCAPA. This approach was also important in decision making regarding management and planning for anatomic surgical correction.



Figure 1 Transthoracic colour-flow Doppler echocardiography. (A) Four-chamber view (B) Parasagittal short axis view. Both images show multiple collateral vessels within the IV septum and abnormal signals in the coronary arteries, indicating dilatation and tortuosity. RA, right atrium; LA, left atrium; LV, left ventricle; RV, right ventricle; RVO, right ventricular outflow; LVO, left ventricular outflow; IV, interventricular.

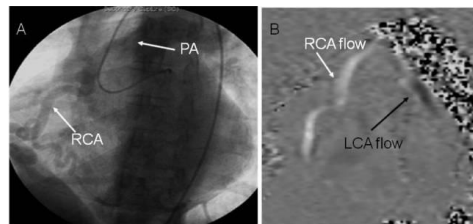


Figure 2 (A) Coronary angiogram. The catheter is in the aorta and the left main is engaged. Collateral vessels from the LCA deliver contrast media into the RCA, which subsequently drains into the main PA. (B) MRI velocity flow map. Coded black is flow down the LCA away from the aorta. Coded white is flow up the RCA towards the main PA. PA, pulmonary artery; RCA, right coronary artery; LCA, left coronary artery.

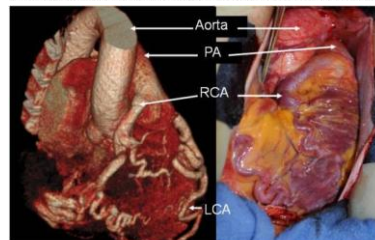


Figure 3 (A) Three-dimensional rendering of CT angiogram demonstrating ARCAPA. The right coronary artery originates from the anterior, lateral aspect of the pulmonary artery approximately 8mm above the pulmonary valve. (B) Intra-operative images of ARCAPA, prior to surgical correction. PA, pulmonary artery; RCA, right coronary artery; LCA, left coronary artery.

References:

- Schmitt R, Froehner S, Brunn J et al. Congenital anomalies of the coronary arteries. *Eur Radiol* 2005; 14:2172-2181
- Williams I, Gersony W, Hellenbrand W. Anomalous right coronary artery arising from the pulmonary artery: A report of 7 cases and a review of the literature. *Am Heart J* 2006;152:1004, e9-e17
- Brookes HSJ. Two cases of an abnormal coronary artery of the heart arising from the pulmonary artery: with some remarks upon the effect of this anomaly in producing cricoid dilatation of the vessels. *J Anat Physiol* 1885; 20:26-9
- Modi H, Ariyachaipanich A, Dia M. Anomalous origin of right coronary artery from pulmonary artery and severe mitral regurgitation due to myxomatous mitral valve disease: a case report and literature review. *J Invasive Cardiol* 2010; 22:E49-55
- Yao C, Wang J, Yeh C et al. Isolated anomalous origin of the right coronary artery from the main pulmonary artery. *J Card Surg* 2005;20:487-489
- Kuhn A, Kasnar-Samprec J, Schreiber C. Anomalous origin of right coronary artery from pulmonary artery. *Int J Cardiol* 2010;39:e27-e28