Anomalous Right Coronary Artery

Arising from Pulmonary Artery in a Woman with Ventricular Dysfunction

Ayesha Salahuddin, MD
Syed A. Abbas, MD
Ali N. Zaidi, MD

A 56-year-old multiparous woman presented with chest pain, palpitations, and worsening dyspnea on exertion. She had a history of substance abuse. A systolic ejection murmur was audible at the left sternal border. Laboratory findings were normal. An electrocardiogram revealed sinus rhythm with left ventricular (LV) hypertrophy.

A transthoracic echocardiogram showed right ventricular hypertrophy, normal right ventricular systolic function, and moderately depressed LV systolic function (ejection fraction, 0.35–0.40). Anomalous flow arising from the pulmonary artery (PA) was noted in color-flow Doppler mode (Fig. 1). A cardiac computed tomographic angiogram revealed an anomalous right coronary artery from the PA (ARCAPA) with dilated epicardial coronary arteries and prominent left-to-right collateral vessels (Fig. 2). The patient was started on medical therapy for LV dysfunction. It was thought that ARCAPA was contributing to the development of heart failure, so she was referred for surgical reimplantation of the right coronary artery to the aorta. However, she was lost to follow-up and, to our knowledge, never proceeded with surgical correction.

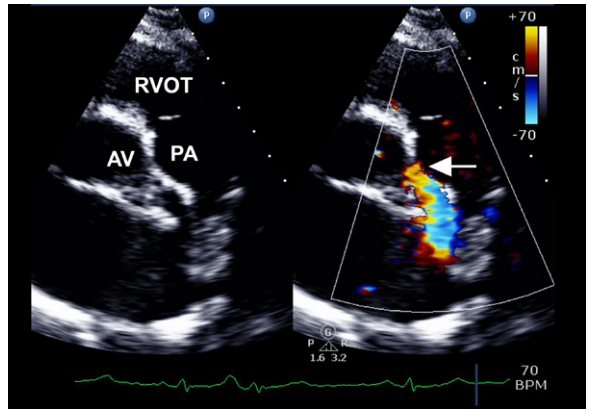

Fig. 1 *Transthoracic echocardiogram (in modified parasternal short-axis view and color-flow Doppler mode) shows anomalous flow arising from the pulmonary artery (PA) (arrow).*

AV = aortic valve; RVOT= right ventricular outflow tract

Supplemental motion image is available for Figure 1.

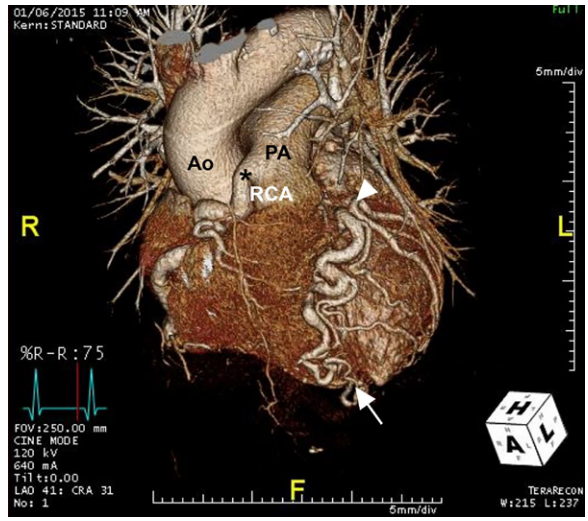

Fig. 2 *Cardiac computed tomographic angiogram shows the origin of the right coronary artery (asterisk, RCA) from the pulmonary artery (PA), the origin of the left anterior descending coronary artery from the aorta (arrowhead), and dilated epicardial coronary arteries and prominent left-to-right collateral vessels (arrow).*

Section Editor:
Raymond F. Stainback, MD

From: *Montefiore Heart & Vascular Care Institute (Drs. Abbas, Salahuddin, and Zaidi), Montefiore Adult Congenital Heart Program (Dr. Zaidi), and The Children's Hospital at Montefiore, The Pediatric Heart Center (Dr. Zaidi), Albert Einstein College of Medicine, Bronx, New York 10467*

Address for reprints:
Ayesha Salahuddin, MD, Albert Einstein College of Medicine, 111 E. 210th St., Bronx, NY 10467

E-mail:
ayeshas.md@gmail.com

Comment

A congenital condition, ARCAPA constitutes 0.12% of all coronary anomalies.[1] About 50 cases of ARCAPA have been reported; most were diagnosed in infants and children.[2] In comparison with anomalous left coronary artery arising from the PA, ARCAPA is slightly rarer (incidence, 0.002% vs 0.008%), usually presents later in life, and is less likely to present with congestive heart failure, myocardial ischemia, or sudden cardiac death.[3] In individuals with ARCAPA, a coronary artery steal phenomenon can develop between the pulmonary and systemic arterial beds resulting from reverse coronary flow in the anomalous artery.[1] After birth, pulmonary vascular resistance decreases, and the degree of early collateralization will predict the natural course in these patients. As imaging methods continually become more advanced, ARCAPA may be found more often, and the need for intervention will depend on the specific clinical situation.

References

1. Halim SA, Wang A, Harrison JK. Anomalous right coronary artery origin from the pulmonary artery (ARCAPA) coexisting with obstructive atherosclerotic disease of the left coronary artery. J Invasive Cardiol 2011;23(1):E260-1.
2. Yamanaka O, Hobbs RE. Coronary artery anomalies in 126,595 patients undergoing coronary arteriography. Cathet Cardiovasc Diagn 1990;21(1):28-40.
3. Williams IA, Gersony WM, Hellenbrand WE. 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(5):1004.e9-17.