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Case Report

Anomalous origin of the right coronary artery ☆☆☆

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ABSTRACT

Coronary artery anomalies are congenital variations of the origin(s), course(s), and terminations(s) of the 3 main epicardial coronary arteries that make up less than 1% of cases. Clinically, coronary artery anomalies can be asymptomatic or present with dyspnea, chest pain, and even sudden cardiac death. In this report, we discuss the case of a patient who was found to have a rare presentation of an anomalous right coronary artery originating from the anterior ascending aorta 20.9 mm above the sino-tubular junction that was discovered on coronary CT angiography.

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Introduction

Coronary artery anomalies (CAA) are congenital variations of the origin(s), course(s), and termination(s) of the 3 main epicardial coronary arteries: the right (RCA), the left anterior descending, and the left circumflex [1]. In normal anatomy, the RCA originates from the right sinus of Valsalva, and the left anterior descending and left circumflex originate as branches of the left main coronary artery which emerges from the left sinus of Valsalva. There is significant interindividual heterogeneity of the coronaries leading to multiple common variants being described. CAAs are therefore defined as the variations that make up less than 1% of cases [2]. Regarding the RCA

specifically, anomalous origins have included the pulmonary trunk, ascending aorta, and the opposite coronary sinus. The clinical significance of anomalous coronary origin often depends on the course the artery takes with most variations remaining asymptomatic. In some instances, however, dyspnea, chest pain, and even sudden cardiac death may [3,4].

Case report

A 64-year-old female with a medical history of paroxysmal atrial fibrillation and hyperlipidemia presented to the cardiology clinic due to 8 months of intermittent chest pain

Abbreviations: CAA, Coronary Artery Anomaly; Coronary CTA, Coronary CT Angiography; RCA, Right Coronary Artery.

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Fig. 1 – Coronary CTA. Curved multiplanar reformatted coronary CTA images demonstrating the anomalous origin of the right coronary artery (red arrow).

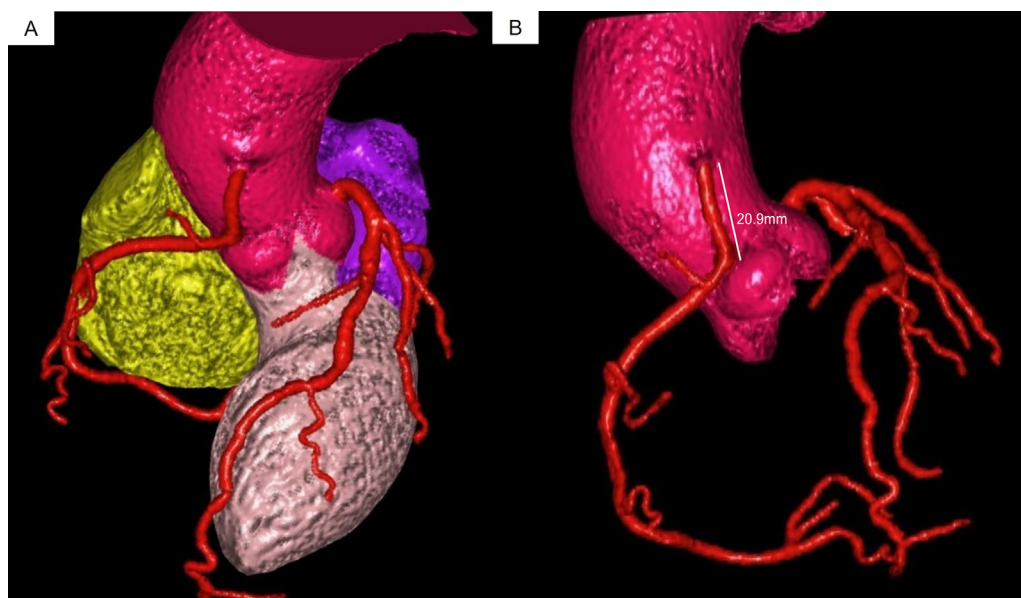


Fig. 2 – Volume rendered coronary CTA. Volume rendered image at 70% cardiac phase using a Revolution GE CT Scanner and prospective gating demonstrating the anomalous origin of the right coronary artery (Panel A). (Panel B) demonstrates anomalous origin originating 20.9 mm above the sino-tubular junction.

atypical for angina. An echocardiogram was performed and notable for an ejection fraction of 55%-60% with no regional wall motion abnormalities. A nuclear stress test was interpreted as negative for ischemia. At a 2-month follow-up appointment, the patient continued to have intermittent symptoms; therefore, further assessment was performed with coronary CT angiography (coronary CTA). Coronary CTA was negative for obstructive coronary artery disease; however, it demonstrated an anomalous RCA originating from the anterior ascending aorta 20.9 mm above the sino-tubular junction and superior to the right sinus of Valsalva but taking an otherwise normal course more distally as seen in Figs. 1 and 2. It was felt that this anomaly was unlikely to be the etiology of the patient's symptoms and the patient was reassured and referred to her primary care physician for further noncardiac workup.

Discussion

To our knowledge, this is the first reported case of an anomalous RCA originating from the ascending aorta seen initially on coronary CTA. All previous case reports thus far have reported this specific anomalous origin based on conventional coronary angiography. Anomalous RCA origins directly from the aorta are exceedingly rare as demonstrated in a study by Yuksel et al. in 2013 which looked at 16,573 patients. This study found a prevalence of anomalous coronary artery in 0.29% of patients, and an even smaller prevalence of 0.006% for anomalous origin of RCA from ectopic ostium in the ascending aorta [5]. Coronary CTA was recently given a class IA recommendation by the American College of Cardiology for the evaluation of patients with stable chest pain [6]. In this patient's presen-

tation, the use of coronary CTA as a first-line diagnostic test could have decreased the total healthcare cost and radiation exposure to the patient.

Patient consent

This manuscript was created after written informed consent for publication of their case was obtained from the patient.

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