

## Volunteering Saved my Life! A Case of Anomalous Right Coronary Artery Take Off

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### INTRODUCTION

Anomalous right coronary artery from the left sinus is a rare and potentially serious congenital variant that can present with chest pain, and sudden cardiac death.<sup>1</sup> About 80% of coronary artery abnormalities seen during catheterization are benign incidental findings.<sup>2</sup> However, ectopic coronary origin from the pulmonary artery or opposite aortic sinus, single coronary artery, and large coronary fistulae are serious anomalies resulting in angina pectoris, myocardial infarction, heart failure, arrhythmias, and even sudden cardiac death.<sup>1,2</sup> We present a case of an asymptomatic middle-aged male with an abnormal electrocardiogram (EKG) rhythm strip while volunteering at an EMS course and was found to have an anomalous right coronary artery originating from the left aortic coronary sinus.

### CASE REPORT

A 54-year-old white male with no significant past medical history, presented to his primary care physician with an abnormal electrocardiogram monitor strip. The patient worked as an emergency medical technician and during a first aid course, he volunteered for an EKG monitor placement and noticed repolarization abnormalities (i.e., T wave inversions). A 12-lead EKG at the primary care physician's office was normal (Figure 1).

Upon further investigation, the patient stated a positive family history of coronary artery disease in his father, but at an older age. He reported tiredness and exertional dyspnea. Physical examination was unremarkable. He was referred for an exercise nuclear stress test which revealed a large area of reversible ischemia within the right coronary artery distribution.

Then, a coronary angiogram was done and showed an anomalous Right Coronary Artery (RCA) originating from the left coronary sinus of Valsalva (Figure 2). There was no evidence of any obstructive atherosclerotic coronary artery disease. A computed tomography scan was subsequently obtained, confirming this diagnosis with a large proximal right coronary artery, with an intramural course between the pulmonary artery and aorta. The patient was referred for a surgical intervention. A vein graft was bypassed to a 1.5 mm patent ductus arteriosus, which had flows of 110 cc per minute. The patient tolerated the procedure well. He was started and discharged on aspirin, statin, and beta-blocker.



Figure 1. Normal electrocardiogram at the primary care office.

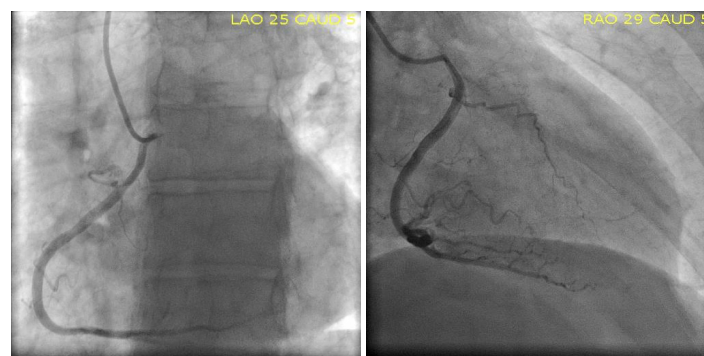


Figure 2. Coronary angiography revealed the anomalous right coronary artery from the left sinus of Valsalva.

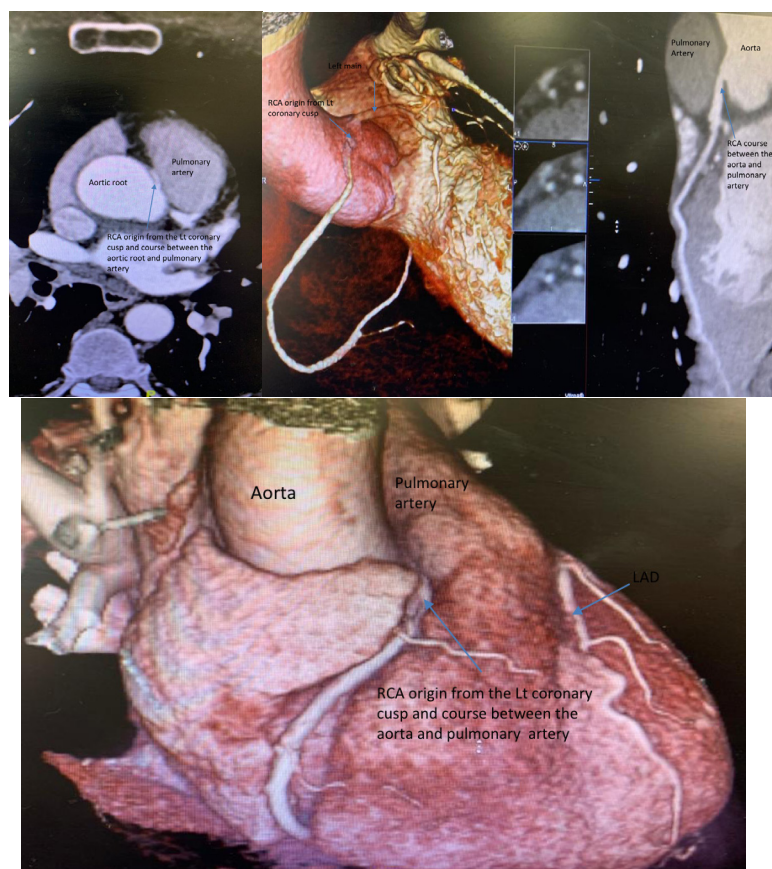


Figure 3. Cardiac coronary CAT scan showed the aberrant course of the right coronary artery with intramural course. LAD: left anterior descending artery; RCA: right coronary artery.

## DISCUSSION

The incidence of anomalous origin of the RCA arising from the left coronary cusp that courses between the great vessels varies between 0.026% and 0.250%.<sup>3</sup> The initial presenting symptom may be sudden cardiac death, because the high inter-arterial course of the anomalous RCA between the pulmonary artery and aorta is at risk for being compressed during exertion. Therefore, making a timely correct diagnosis with the subsequent appropriate surgical procedure can improve outcomes significantly.

We reported a case report of a surgically repaired anomalous right coronary artery in a patient presenting with an abnormal EKG monitor strip. This is the first known case to reveal another presenting chief complaint for an underlying anomalous right coronary artery. It is crucial to document such presentations among physicians for early recognition and treatment.

EKG repolarization abnormalities on rhythm strips are usually due to underlying bundle branch block, hypertrophy or non-specific. Dynamic repolarization abnormalities or persistent changes in multiple configurations/axis, in the presence of a normal QRS configuration and duration, should raise suspicion for ischemia. Stress testing does not always show ischemic changes in patients with coronary anomalies. Thus, when the symptoms are typical or when there is a high suspicion for coronary anomalies (typical exertional symptoms in young patients), one should consider anatomical imaging with cardiac computed tomography or magnetic resonance imaging. Cardiac computed tomography especially is suited to identify the origin and course of coronary arteries, and their relationship to other major vessels and structures. It is superior and more detailed than coronary angiography and definitely more diagnostic than stress testing.

Anomalous coronary arteries are the second most common cause of sudden death in young athletes.<sup>4</sup> Our patient was fortunate to have this discovered with minimal symptoms and before any bad outcome occurred. Screening for cardiac disease in college sports participants is still a subject of debate with opposing strategies between the American and European guidelines.<sup>5</sup> A clinician index of suspicion, good history, and physical exam are still the main initial strategy and the driver of further evaluation.

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