

IMAGES IN INTERVENTION

# Right Coronary Artery With Anomalous Origin

## The Role of Imaging Techniques



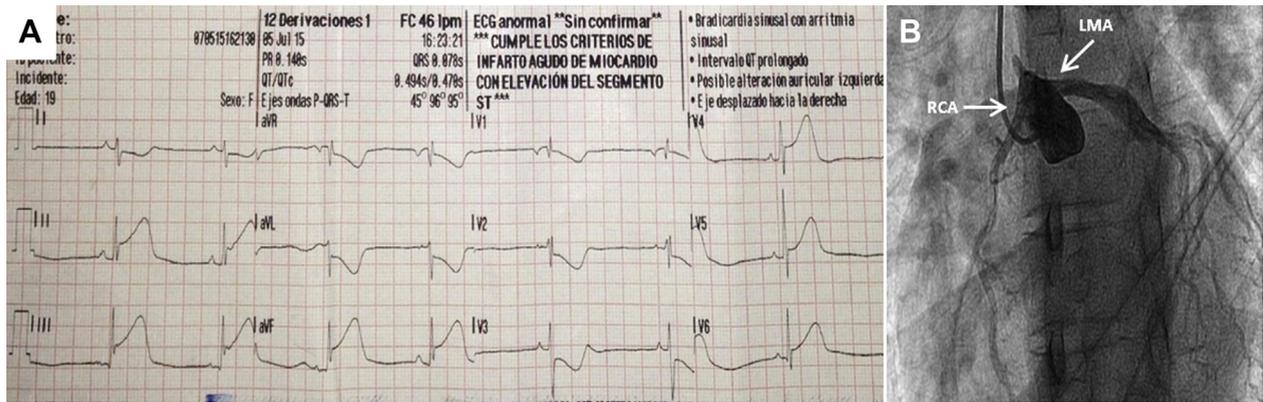
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A 19-year-old woman with no relevant medical history presented to the hospital with typical chest pain, starting while she was running. Her electrocardiogram showed significant ST-segment elevation in inferior and  $V_4$  to  $V_6$  leads (Figure 1). In the transthoracic echocardiogram exam the left ventricle (LV) inferior segments were hypokinetic and the right ventricle (RV) systolic function was mildly impaired. Urgent coronary angiography (CA) was performed revealing right coronary artery (RCA) arising from a single ostium in the left sinus of Valsalva (Figure 1, Online Video 1). Computed tomography coronary angiography confirmed this finding, demonstrating a sharpened proximal RCA, coursing between the aortic root and

pulmonary artery (Figures 2A and 2B). A significant increase of myocardial necrosis marker was observed (total creatine kinase 1207 IU/l, troponin I 271.73  $\mu\text{g/l}$ ). Cardiac magnetic resonance showed a subendocardial area of delayed gadolinium enhancement in the inferior LV wall and the RV (Figures 2C and 2D).

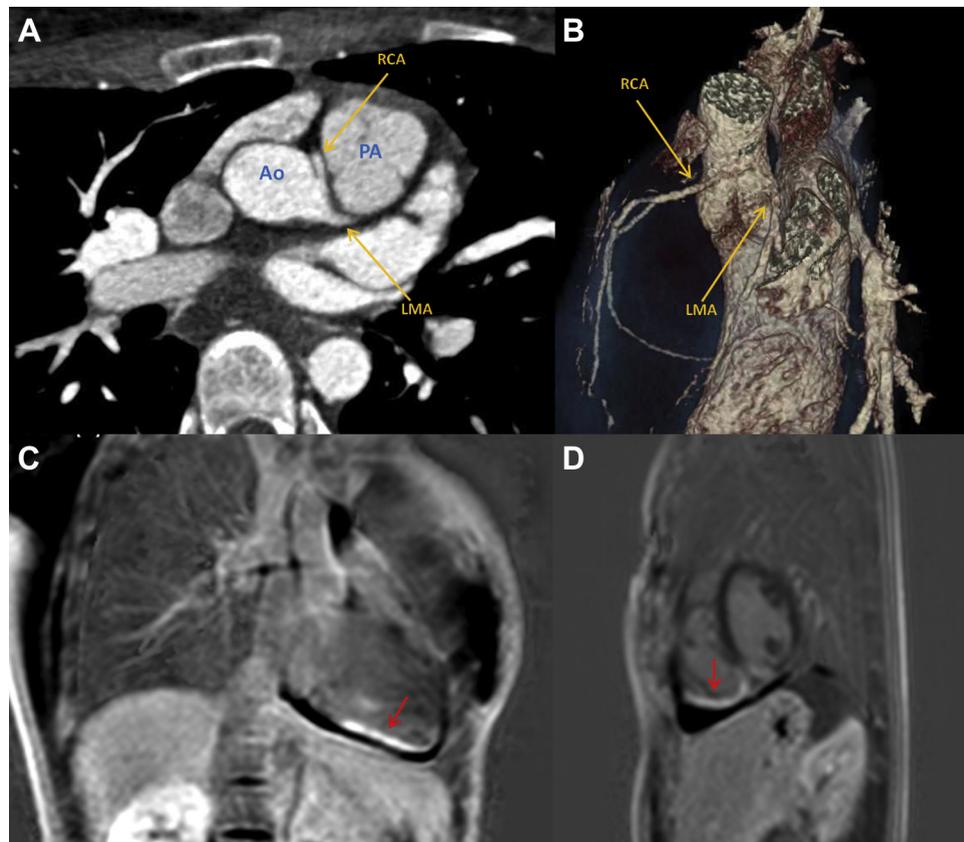
With these findings intervention was justified, so a complete evaluation was carried out to establish the treatment options. A second CA with intravascular ultrasound (IVUS) was performed for further evaluation. The IVUS proved systolic compression and diastolic decompression of the proximal 20 mm of RCA. A  $3 \times 28$  mm drug-eluting stent was directly implanted in the place of

**FIGURE 1 Urgent Electrocardiogram and Coronary Angiography Findings**



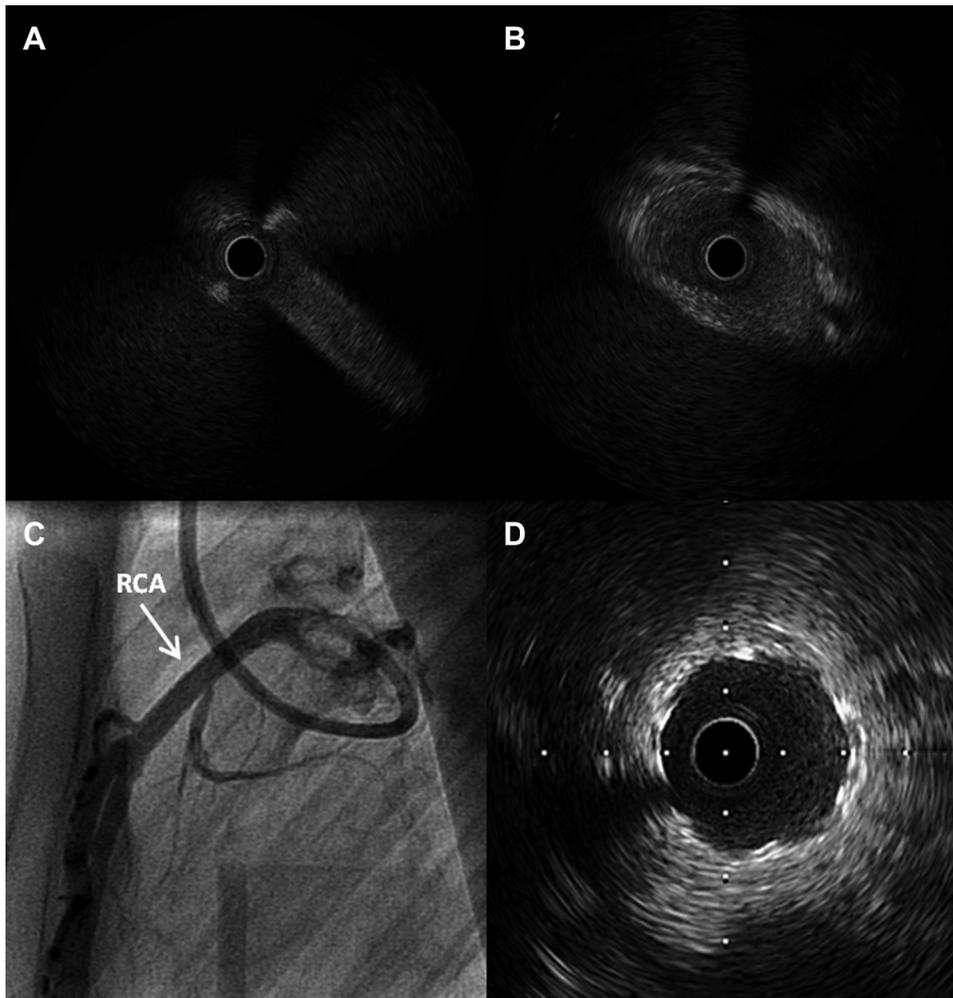
**(A)** Electrocardiogram with signs of myocardial ischemia. **(B)** Coronary angiography reveals the anomalous origin of the right coronary artery (RCA) from the left sinus of Valsalva. LMA = left main artery ([Online Video 1](#)).

**FIGURE 2 Findings on the Imaging Studies: Computed Tomography Coronary Angiography and Cardiac Magnetic Resonance**



**(A, B)** Computed tomography coronary angiography showing anomalous origin and course of the right coronary artery (RCA) between the aortic root (Ao) and pulmonary artery (PA). **(C, D)** Cardiac magnetic resonance views demonstrating subendocardial late gadolinium enhancement (red arrows). LMA = left main artery.

**FIGURE 3** Intravascular Ultrasound Image of the Proximal RCA



(A, B) Image of the systolic compression and diastolic decompression of the proximal 20 mm. (C) drug eluting stent implanted. (D) Intravascular ultrasound of the proximal right coronary artery (RCA) after stent angioplasty with the area expanded and optimal angiographic result (Online Videos 2, 3, and 4).

the compression with optimal angiographic result and adequate expansion demonstrated by IVUS (Figure 3, Online Videos 2, 3, and 4). Prior to discharge, exercise stress test result was normal and systolic LV and RV function was normalized in echocardiogram. The patient will take dual-antiplatelet therapy for at least 6 months.

In symptomatic patients with anomalous origin of the RCA intervention is indicated. In this case, integration of clinical presentation with the findings in imaging techniques was essential to decide the best management strategy.

**REPRINT REQUESTS AND CORRESPONDENCE:**

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**KEY WORDS** coronary anomalies, congenital heart defects, ischemia, right coronary artery

**APPENDIX** For supplemental videos, please see the online version of this article.