



## Left Coronary Ostial Atresia and Unstable Angina with Coronary Artery Stenosis: An Unusual Co-occurrence

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### ABSTRACT

Coronary ostial atresia is a rare anomaly that can present in various combinations. Left ostial coronary atresia is one of the rarest types of the coronary anomalies. In this case report, we present a patient with a single coronary artery arising from the right sinus of the Valsalva and anomalous course of the left coronary artery, which demonstrated occlusion in the circumflex branch. Using different imaging modalities, such as conventional angiography and computed tomography, is essential to understand the patient's anatomy and determine the best course of management.

**Key Words:** Coronary angiography; coronary anomaly; left ostial coronary atresia

### Koroner Arter Stenozunun Neden Olduğu Anstabil Anjina ve Sol Koroner Osteal Atrezi: Nadir Görülen Birliktelik

#### ÖZET

Koroner osteal atrezi, çeşitli varyasyonlarla ortaya çıkabilen nadir bir anomalidir. Sol osteal koroner atrezi, koroner anomaliler arasında en nadir görülenlerden biridir. Bu olgu sunumunda sağ sinüs valsalvadan kaynaklanan tek koroner arter ve sirkümfleks dalında tıkanıklık gösteren anormal seyirli sol koroner arter hastası sunuldu. Geleneksel anjiyografi ve bilgisayarlı tomografi gibi farklı görüntüleme yöntemlerinin kullanılması, anatomiye anlamak ve tedaviye karar vermek için esastır.

**Anahtar Kelimeler:** Koroner anjiyografi; koroner anomali; sol osteal koroner atrezi

### INTRODUCTION

Single coronary artery (SCA) is a rare anomaly that can present in various combinations. We present a case of SCA originating from the right sinus of Valsalva (RSoV) with an anomalous course of the left coronary artery anterior to the pulmonary trunk. The patient also demonstrated unusual distal anastomosis at the junction of the mid and distal left anterior descending artery (LAD) with occlusion of the circumflex (CX) artery. The patient had a coronary anomaly, which is compatible with Lipton class RIIa<sup>(1)</sup>. For this case, we used different imaging methods, including conventional angiography (CA) and computed tomography (CT).

### CASE REPORT

A 53-year-old man presented to our clinic with angina, which is provoked by exertion. His symptoms were present for 1 week. His electrocardiography was normal, and physical examination did not show any significant findings. He had a history of smoking for 25 years as well as hypercholesterolemia. We decided to proceed with CA because of typical chest pain and high pretest probability. His CA showed the absence of left coronary ostium (Figure 1). He had an SCA arising from the RSoV (Figure 2). Vieussens pre-conal artery (VPA) derived from the proximal portion of the right coronary artery (RCA) and gave rise to the CX and LAD arteries (Figure 2). Anteroposterior CA at a 40-degree cranial view showed that the VPA first filled the LAD, then the CX artery. It also showed significant stenosis in the CX artery (Figure 2). Right anterior oblique (20 degrees) and caudal (20 degrees) views showed the proximal and distal LAD and branching of the CX and obtuse marginalis (OM) arteries.

After CA, we proceeded with CT to detect possible additional anomalies. CT showed that the RCA arises from the RSoV and that the VPA arises from the right coronary ostium (Figure 3A). A course of the VPA is visualized by CT (Figure 3B-D). The left coronary ostium atresia is also shown by CT (Figure 3C), as is the anomalous origin of the LAD and CX by a large artery arising off the RCA, passing anterior to the pulmonary outflow tract (Figure 4).

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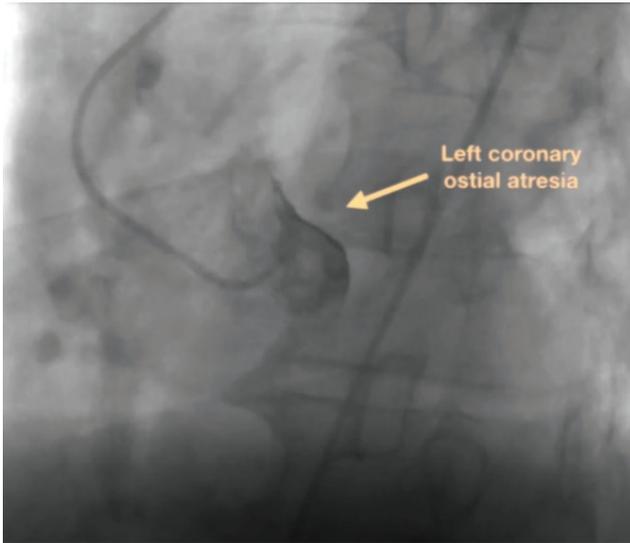
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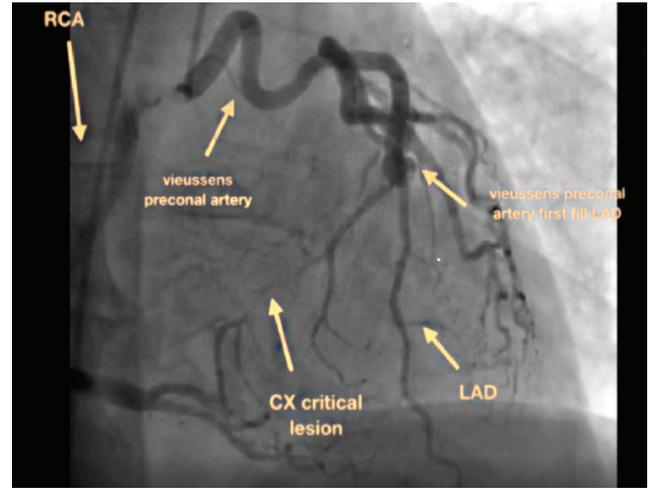
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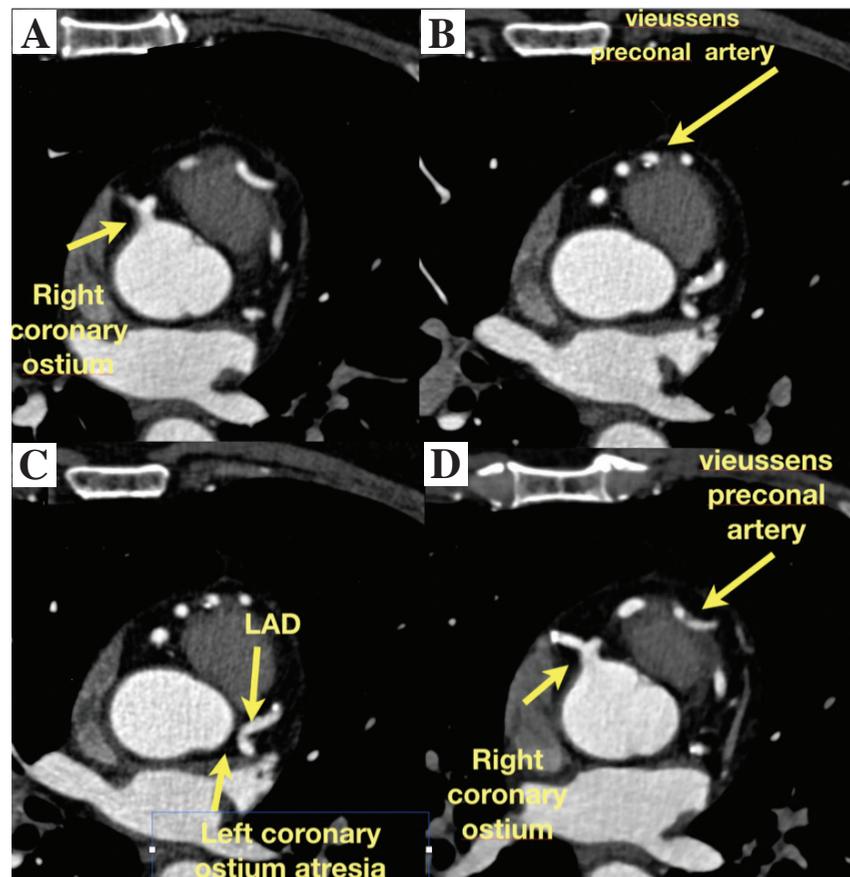
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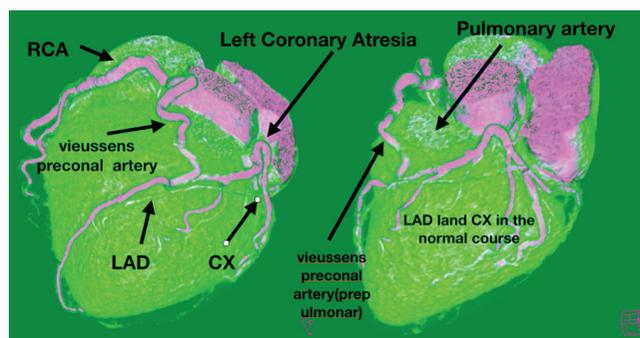
**Figure 1.** Left coronary atresia has shown by conventional coronary angiography.



**Figure 2.** The Vieussens pre-conal artery arises from the proximal portion of the right coronary artery. This artery gave rise to the circumflex and left anterior descending arteries. There is also significant stenosis in the CX artery.



**Figure 3.** A. Computed tomography demonstrated that the right coronary artery arises from the right sinus of the Valsalva and Vieussens pre-conal artery from the right coronary ostium. B. The course of the Vieussens pre-conal artery is shown by computed tomography. C. Computed tomography demonstrated left coronary ostial atresia. D. Computed tomography showed the rise of the Vieussens pre-conal artery from the right coronary artery as well as its course.



**Figure 4.** Computed tomography showed the anomalous origin of the left anterior descending and circumflex arteries by a large artery arising from the right coronary artery, passing anterior to the pulmonary outflow tract in the distribution of the conus branch.

After CA and CT, myocardial perfusion scintigraphy was performed, which detected 1% ischemia on the lateral wall. Because of the low ischemia ratio and well-controlled symptoms, medical treatment was decided as the best strategy. Also, the VPA had a tortuous course before and after branching of LAD, making it challenging to reach the CX distally. The distal placement of stenosis and the attenuated burden of ischemia by collateral supply indicated that medical treatment was the optimal choice.

## DISCUSSION

The heart is supplied by the right and left coronary arteries. An aberrant origin of the main stem coronary artery from the RSoV is known to be one of the rarest coronary anomalies. The incidence of SCA, reported at only 0.024% of the population, is rare<sup>(1)</sup>.

Patient data obtained with CA and including 126595 patients revealed SCA in only 56 patients, 19 of whom had R2 type coronary anomalies according to the Lipton classification<sup>(2)</sup>. The term coronary ostial atresia is preferred rather than SCA to identify this type of anomaly, because coronary arteries supply the myocardium in their normal course with the developed VPA<sup>(3,4)</sup>.

Coronary ostial atresia may be associated with ischemia. Ischemia may be a consequence of anatomical reasons with acute angle takeoffs and narrowed segments, which limit blood

flow. Another provoking factor for ischemia may be the course of an anomalous vessel between the aorta and pulmonary artery, which had a tendency to cause compression of the arteries, particularly during exercise<sup>(5)</sup>. As present in this case, being aware of the developed collateral arteries as well as the course of coronary arteries and variations is important when planning possible interventions. Use of cardiac imaging tools is essential to recognize coronary anomalies and to understand the association of the anatomy with clinical symptoms. Increasing awareness about these rare congenital anomalies may improve patient management. In the presented case, use of different imaging methods allowed an extensive understanding of coronary anatomy and contributed to the management of this patient. We aim to increase awareness about coronary anomalies and the use of imaging in these patients.

**Informed Consent:** Written informed consent was obtained from the patient who participated in this study.

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**Conflict of Interest:** The authors have no conflict of interest to declare.

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