

Single Coronary Artery from the Right Sinus of Valsalva: An Exceptional Anomaly

Radi Fatima Zohra*, El Hattab Fatima Zahra, Loubna Hara, Zahdi Othman, Jamila Zarzur and Cherti Mohamed

Department of Cardiology, University Mohammed V, CHU Ibn Sina Rabat, Morocco

*Corresponding Author: Radi Fatima Zohra, Department of Cardiology, University Mohammed V, CHU Ibn Sina Rabat, Morocco.

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Abstract

Congenital coronary artery anomalies are rare and often accidental finding. The origin of the left coronary artery (LCA) from the right sinus is even rarer. Sudden death in young athletes is the most common expression. Here, we present an interesting case of a 54-year-old of acute coronary syndrome (ACS), which revealed single coronary artery. Management of Congenital coronary artery anomalies during ACS may represent a unique clinical challenge. In this manuscript, we review the clinical presentation, anatomic considerations, and management strategy.

Keywords: Congenital Coronary Artery Anomalies (CAA); Left Coronary Artery (LCA)

Introduction

Congenital coronary artery anomalies (CAA) are rare and often accidental finding, They are usually associated with other cardiac anomalies and are classified as anomalies of origination and course, anomalies of intrinsic coronary arterial anatomy, anomalies of coronary termination and anomalous anastomotic vessels. The origin of the left coronary artery (LCA) from the right sinus is even rarer (incidence 0.15%). but its diagnosis is very important due to the connection with sudden death in young athletes. Here, we present an interesting case of a 54-year-old of with a single coronary artery arising from right sinus who suffered an acute coronary syndrome.

Objective of the Study

This case highlights the importance of multimodality approach to help to obtain a more timely diagnosis of congenital coronary artery anomalies.

Case Report

A 54-year old men with a smoking as cardiovascular risk factors, he was admitted to our department admitted for management for non-persistent anterior ST-elevation myocardial infarction treated with medical treatment.

Coronary angiography disclosed the entire coronary circulation arising from the right Valsalva sinus, from a single ostium, after a common main stem (CMS), the artery divided into a dominant RCA, and into a left main stem (LMS) that finally bifurcated into the left anterior descending (LAD) and left circumflex artery (LCX).

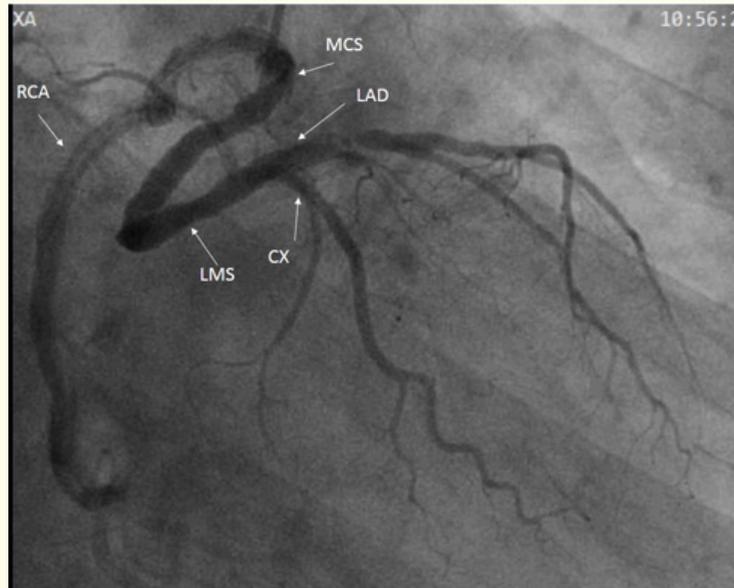


Figure: Coronary angiography, left anterior oblique view. MCS: Common Main Stem; LMS: Left Main Stem; LAD; Left Anterior Descending Artery with Critical Stenosis in the Mid Segment; LCX: Left Circumflex; RCA: Right Coronary Artery.

Discussion

Anomalous origin of a coronary artery from the contralateral sinus of Valsalva is particularly interesting from a clinical point of view, because these anomalies can be associated with sudden cardiac death, especially when the anomalous coronary artery crosses inter-arterially between the aorta and the pulmonary artery [1]. The causes are not obvious. From the contralateral sinus of Valsalva, there are five potential paths towards its perfusion territory that coronary artery can follow when: pre-pulmonic, anterior to the right ventricular outflow tract (usually benign, though rarely associated with angina); retroaortic, posterior to the aortic root (no hemodynamic consequences); transeptal, with a sub-pulmonic intramyocardial course; retrocardiac, behind the mitral and tricuspid valves, in the posterior atrioventricular groove; and interarterial, between the aorta and the pulmonary artery [1,2].

On rare occasions, autopsy findings have shown an acute angle in the takeoff of the anomalous coronary artery with a slit like lumen and a proximal course between the aorta and the pulmonary trunk.

In contrast, that anomalous origin of a coronary artery from an opposite sinus of Valsalva is related with sudden death mostly in young athletes < 35 years old but less frequently in older patients [3,4].

Many clinical questions remain regarding the Diagnosis of this anomalous. Diagnostic workup in patients with the above symptoms (especially young athletes) must include electrocardiography, holter monitoring and focused expert echocardiography. If at least two normally located coronary ostia can be identified with echocardiography, no further investigations are needed. However, if echocardiographic findings are inconclusive, further imaging with computed tomography or magnetic resonance imaging is recommended. If the anomaly is confirmed, patients should undergo nuclear stress testing. Coronary angiography may reveal additional obstructive coronary disease, and intracoronary imaging establishes the severity of the condition [5].

The authors suggest that when an anomalous left coronary artery (LCA) with origin from the right sinus of Valsalva is diagnosed incidentally during coronary angiography, specific angiographic anatomical findings help differentiate between the interarterial and the more benign transseptal varieties of this anomaly, since in the transseptal origin the LMS gives rise to the first septal branch, presents a mild concentric myocardial bridge effect at the distal segment and connects with mid LAD. However, A careful analysis of clinical presentation together with angiography combined with multislice coronary CT, which remains the most accurate method to characterize the course of ectopic coronary arteries, is useful to optimize therapy and minimize the risk to the patient [2].

Conclusion

No consensus document or guidelines exist regarding the diagnosis and management of Congenital coronary artery anomalies however, the rapid advancement of imaging techniques gave us more information on the subject as well as more accurate diagnostic criteria regarding the severity of these conditions that allow risk-stratification for sudden cardiac death and provide guidelines for optimal treatment.

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