

ANOMALOUS ORIGIN OF THE LEFT CIRCUMFLEX CORONARY ARTERY FROM THE RIGHT AORTIC SINUS OF VALVALSA: CASE REPORT.

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Abstract

Most anomalies in the origins of the coronary arteries are asymptomatic and are discovered as incidental findings in coronary arteriography. The ectopic origin of the circumflex artery is a recognized variant, being the most common anomalous origin a separated ostium in the right aortic sinus. Case description: This paper presents the case of a 78-year-old patient with acute myocardial infarction and an anomalous finding of the circumflex artery of the right aortic sinus. Conclusions: The coronary arteries can present different anatomical variations, which is why it must be taken into account in the differential diagnosis in patients with myocardial ischemia.

Keywords: Anomalous coronary artery, Arteriography, Acute myocardial infarction, Ischemia.

Introduction

Right and left coronary arteries have their origin in the aortic sinuses of Valsalva (1). The right coronary artery originates from the right sinus, while the left coronary artery originates from the left sinus giving two branches, the anterior descending artery and the circumflex artery (2,3). There are variations in coronary anatomy that are considered normal due to the frequency with which they occur in the population; however, those with a frequency of presentation of less than 1% are considered anomalies (1,4,5). Most abnormalities in the coronary arteries origin are asymptomatic and are discovered as incidental findings in coronary arteriography (0.6 to 1.55%), and in 0.3 to 0.5% of autopsies (1,6). The ectopic origin of the circumflex artery is a recognized variant, its most common anomalous origin presents with a separate ostium in the right aortic sinus from which the circumflex branch originates in the proximal segment of the right coronary artery (7,8,9). Although this anomaly has been classified as benign and asymptomatic, there are studies that associate it with angina pectoris, myocardial infarction and sudden death in the absence of atherosclerotic lesions (10-13). Arteries with an anomalous origin are not more vulnerable to atherosclerosis than those with an eutopic origin (14). The pathophysiological mechanism of ischemia and sudden death in coronary artery anomalies remains uncertain and, therefore, their cause-effect relationship in the cases described is hypothetical (15). The present publication aims to present the case of an elderly patient with anomalous origin of the circumflex artery, found as an incidental discovery during a clinical examination due to anginal cardiovascular symptomatology. This case has a significant importance given its relationship with the differential diagnoses in patients with acute myocardial infarction, being of vital relevance its early identification.

Case Report

A 78-year-old male with a history of hypertension and heavy smoking, who was hospitalized for a one-year clinical picture, consisting of functional class deterioration, accompanied by oppressive retro sternal chest pain, not radiating, associated with moderate physical effort, which intensified in the last three months when climbing

slopes, also presenting headache, dizziness associated with angina, dyspnea and presyncope in the last week. An electrocardiogram was performed showing sinus rhythm, complete right bundle branch block with repolarization inversion at anteroseptal level, J point elevation, right axis deviation and inferior necrosis. Due to these findings, it was decided to perform coronary arteriography and transthoracic echocardiography. Coronary arteriography evidenced severe disease of the circumflex and right coronary artery, with incidental finding of anomalous origin of the circumflex artery from the right coronary sinus (Figure 1), both vessels were successfully treated with angioplasty using medicated Stents (Figure 2, Figure 3).

Discussion

Most anomalies in the origin of the coronary arteries present no symptoms and are discovered as incidental findings in coronary arteriography (1,6). Although cases of ischemia and myocardial infarction have been described in patients with coronary artery anomalies, the cause-effect relationship is hypothetical (15). In the presented case the coronary catheterization shows evidence of atherosclerosis of an abnormal coronary artery; however, it is well known that the patient has a history of risk factors that predispose to coronary atherosclerosis and in which the cause-effect relationship is well established.

Conclusion

Anatomical variations of the coronary arteries occur in less than 1%. Generally, they are discovered as incidental findings in invasive studies such as coronary arteriography. An early diagnosis is important in order to reduce the incidence of severe clinical conditions associated with the increased mortality in these patients.

Conflict of interest

Each of the authors declare that there is no conflict of interest.

Ethical responsibility

According to resolution number 008430 of 1993 of the Colombian Ministry of Health, specifically taking into account what is stipulated in chapter 1 of article 11, the present project is considered a minimum risk research, likewise this project is outside the principles set forth in the Helsinki declaration of 1964, the present project was endorsed by the scientific technical committee of the Fundación Cardiovascular de Colombia, likewise the authors declare not to have any type of conflict of interest.

Bibliography

1. Villa AD, Sammut E, Nair A, Rajani R, Bonamini R, Chiribiri A. Coronary artery anomalies overview: The normal and the abnormal. *World J Radiol.* 28 de junio de 2016;8(6):537–55.
2. Young PM, Gerber TC, Williamson EE, Julsrud PR, Herfkens RJ. Cardiac imaging: Part 2, normal, variant, and anomalous configurations of the coronary vasculature. *AJR Am J Roentgenol.* octubre de 2011;197(4):816–26.
3. Angelini P. Coronary artery anomalies: an entity in search of an identity. *Circulation.* 13 de marzo de 2007;115(10):1296–305.

4. Angelini P. Coronary artery anomalies--current clinical issues: definitions, classification, incidence, clinical relevance, and treatment guidelines. *Tex Heart Inst J*. 2002;29(4):271–8.
5. Cademartiri F, Runza G, Luccichenti G, Galia M, Mollet NR, Alaimo V, et al. Coronary artery anomalies: incidence, pathophysiology, clinical relevance and role of diagnostic imaging. *Radiol Med (Torino)*. abril de 2006;111(3):376–91.
6. Carmelo V, Toste J, Castela S, Mota Carmo M, Torres D, dos Santos LP, et al. Anomalous origin of the circumflex coronary artery--two case reports. *Rev Port Cardiol Orgao Of Soc Port Cardiol Port J Cardiol Off J Port Soc Cardiol*. agosto de 2007;26(7–8):789–93.
7. Mavi A, Serçelik A, Ayalp R, Pestemalci T, Batyraliev T, Gümüşburun E. Variants in origin of the left circumflex coronary artery with angiography. *Saudi Med J*. noviembre de 2002;23(11):1390–3.
8. Iliiev A, Kotov G, Dimitrova IN. A Rare Case of Multiple Anomalies of the Coronary Arteries. *Cureus*. 13 de junio de 2018;10(6):e2796.
9. Çitaku H, Kamberi L, Gorani D, Koçinaj D, Krasniqi X. Anomalous Origin of Left Circumflex Artery. *Med Arch Sarajevo Bosnia Herzeg*. diciembre de 2015;69(6):423–4.
10. Plastiras SC, Kampessi OS, Gotzamanidou M, Kastanis P. Anomalous origin of the left circumflex artery from the right coronary artery: a case report. *Cases J*. 19 de noviembre de 2008;1(1):336.
11. Sousa H, Casanova J. Coronary artery abnormalities: Current clinical issues. *Rev Port Cardiol Orgao Of Soc Port Cardiol Port J Cardiol Off J Port Soc Cardiol*. marzo de 2018;37(3):227–35.
12. Shaikh GA, Asad A, Ahmed SS. Anomalous Supradominant Left Circumflex Artery with Rare, Rudimentary Left Anterior Descending Artery. *Cureus*. 23 de agosto de 2018;10(8):e3189.
13. von Kodolitsch Y, Franzen O, Lund GK, Koschyk DH, Ito WD, Meinertz T. Coronary artery anomalies Part II: recent insights from clinical investigations. *Z Kardiol*. enero de 2005;94(1):1–13.
14. Kobrossi S, Saade C, Alajaji W, Dakik H. Anomalous origin of the right coronary artery from the mid-left anterior descending coronary artery: association with acute myocardial infarction. *BJR Case Rep*. 2018;4(1):20170031.
15. Zehender M, Faber T, Brunner M, Grom A. [Acute myocardial ischemia and ventricular arrhythmias in the pathogenesis of sudden cardiac death in coronary disease]. *Z Kardiol*. 2000;89 Suppl 3:13–23.

ANNEXES

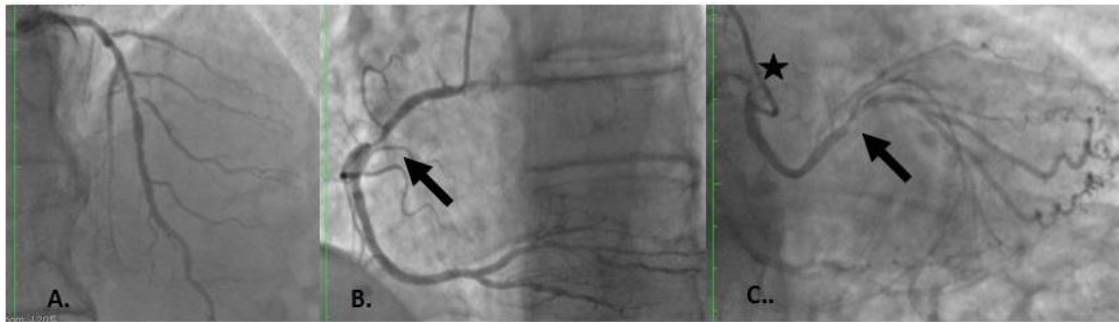


Figure 1. A. Anterior descending artery with independent origin in left coronary sinus with non-severe irregularities, no circumflex artery is evident in this sinus. B. Right coronary artery with normal origin in the right sinus and severe proximal lesion. C. Circumflex artery with independent origin in the right coronary sinus with lesion in the middle third before its bifurcation.

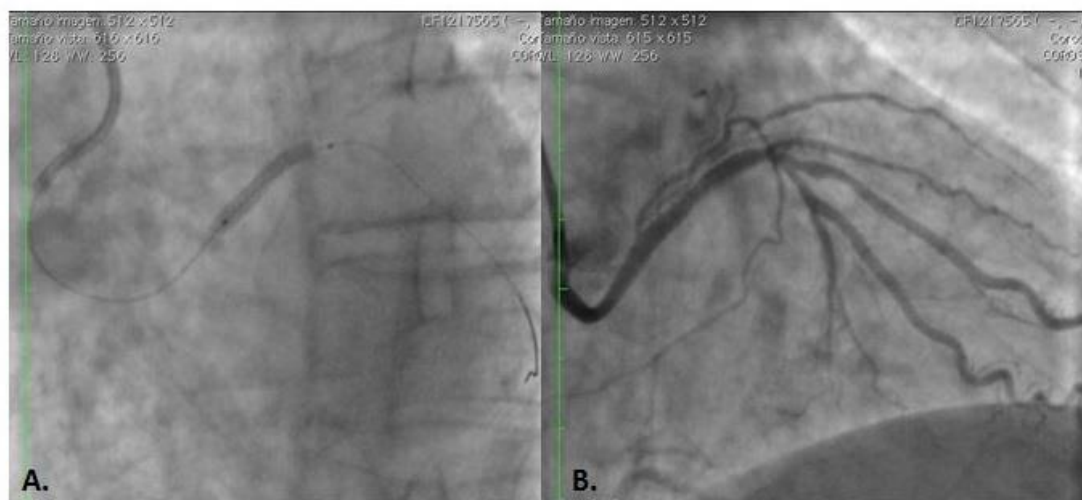


Figure 2. A. Catheterization of the circumflex artery with a left Amplatz 1 guide catheter, predilatation with a 2.5 x 20 NC balloon and implantation of a SYNERGY 3 x 20 medicated Stent. B. Final angiography of residual lesion less than 20%.

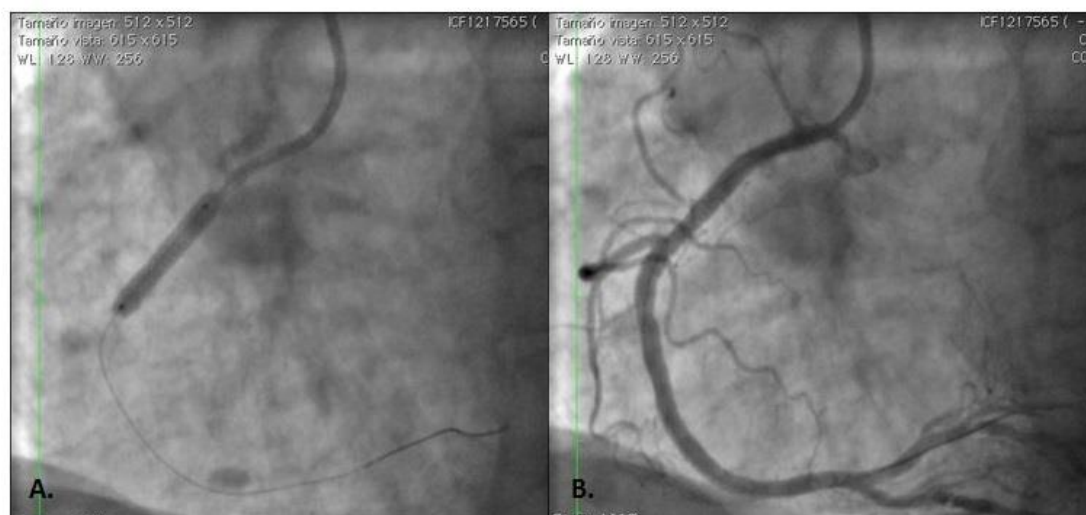


Figure 3. A. The right coronary artery is selectively catheterized with the same catheter and angioplasty is performed with a 2.5 x 20 NC balloon predilatation and SYNERGY 3.5 x 20 medicated Stent is implanted. B. Final angiography with adequate expansion of the lumen without residual lesion.