A rare cause of angina in a middle aged man

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The congenital anomalies of origin of the coronary arteries are rare entities that can be asymptomatic or can manifest with sudden death. The present case shows a 46 years old male with no history of past illnesses who consults for precordial pain. The coronary angiography showed an anomalous origin of the right coronary of the left sinus of Valsalva, this finding was confirmed by a cardiac CT scan. Patient underwent surgery for surgical reimplantation of the right coronary artery with good clinical and radiological results.

Keywords: Cardiac surgery; coronary artery anomaly; congenital heart disease; chest pain


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Introduction

After hypertrophic myocardiopathy, the congenital anomalies of coronary arteries are the second cause of sudden death and myocardial infarction in young athletes population. The anomalies of the origin of the left or right coronary arteries of contralateral sinus are associated with sudden death and may cause myocardial isquemia, arrhythmias and syncope [1]. We present a case with an anomaly of the right coronary artery (RCA) originated in left sinus of Valsalva and high interarterial course, where the surgical treatment for the correction of this anomaly was necessary.

Case Report

A 46 years old male, with no history of past illnesses was referred by his primary care physician for the precordial pain of two months of duration. Physical exam was normal. EKG and biochemical analyse were normal. Echocardiogram showed akinesia of the basal and medium segments. The coronary angiography showed the anomalous exit of the RCA from the left coronary sinus suggesting course between aorta and pulmonary artery. The cardiac CT scan confirmed the aforementioned finding.

Under went for surgical reimplantation of the right coronary artery. In the surgical field the right coronary ostium was found between the left and right Valsalva sinus. It continued inside the aortic wall and come out from the aorta between the right and non-coronary sinus. The RCA was dissected along the entire proximal course and is detached before its exit to the aorta. Then the RCA was anastomosed to the ascendent aorta, near the commissure between the right and noncoronary sinuses. The control angio-CT demonstrates the success in the RCA reimplantation. Postoperative course was uneventful with no angina and with a negative tread-mill test.
Described for the first time by White and Edwards [2] the anomalous origin of the right coronary artery (RCA) is a rare congenital anomaly. Most of the patients with the anomaly of RCA are young and otherwise healthy. The prevalence of this anomaly as it has been reported in an autopsy study is around 0.026%, nevertheless in studies of coronary angiography a higher prevalence of 0.25% has been found [3]. This increment could be justified by the development of new cardiac imaging techniques. Regarding the clinical presentation, the patients can remain asymptomatic or rather associate the angina, myocardial infarction or sudden death [3]. The mechanism of myocardial ischaemia is mainly due to dynamic cause. Some of the factors that impaired coronary blood flow are: the compression of RCA between the pulmonary artery and aorta, the cloven and narrow shape of ostium, and the close angle of the exit from the aortic wall [4].

Kragel and Roberts [5] classified the anomalies of RCA of the left sinus into four types: A, the origin within the left sinus, B, above the left sinus, C, directly above the commissure of the left and right cuspid and D, the common ostium with the left coronary trunk. Also the anomalies of the origin of RCA of the left coronary sinus with an interarterial course, can be divided in two subtypes according to the localization of the origin of the ostium of RCA which besides present different clinical importance. The first subtype are those that have a high interarterial course, with an RCA ostium localized between aorta and pulmonary artery, in that ones the major prevalence of angina and MACE are observed [6]. Those with a low interarterial course where the RCA ostium is localized between aorta and the exit course of the left ventricle those ones are associated with few or no symptoms. According to this classification, our patient was included within the first group where the course of RCA was the aggravating factor for the restriction of coronary blood flow, resulting in the myocardial ischaemia, especially on effort.

Figure 1. Selective coronary angiography of the right coronary artery (RCA). That shows the anomalous origin of the left sinus of Valsalva.
The base of diagnosis is centred in a thorough study of coronary arteries by such imaging techniques. It is important to highlight that among the invasive methods, the coronary angiography, considered before as a “gold standard” in cases of anomalies of coronary arteries, now has been replaced by modern imaging techniques such as multislice computered tomography or magnetic resonance that show us the images in three dimensions [7].

A conservative therapy with the use of betablockers and restriction of the competitive sport activities is proposed in those patients with few symptoms and with perfusion tests that show the absence of myocardial isquemia [8]. The surgical management is controversial, multiple options exist that include the reimplantation of the coronary in the aorta that is the technique that we chose in this case, with that a satisfactory anatomical and physiological repair is achieved, coronary bypass with saphenous vein or right internal mammary artery and ligation or no of RCA in order to avoid the potential competitive flow [9] and finally the technique of “unroofing” that is based on liberation of the roof of the RCA in its intramural proximal course.

With this case we want to highlight the importance of new imaging modalities in a differential diagnosis of myocardial infarction secondary to the anomalies of the origin of
coronary arteries that are besides important for selection of the best treatment option.

Conflicting interests

The authors have declared that no conflict of interests exist.

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Author Contributions

C.M.C.V. performed the literature review and analyzed the case. C.M.C.V. and G.R.C. wrote the manuscript. C.M.C.V.(Corazón Mabel Calle Valda).G.R.C. (Guillermo Reyes Copa).

Abbreviations

CT: Computed tomography; RCA: right coronary artery; EKG: electrocardiogram; MACE: major adverse cardiac events.

References