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Giant right coronary artery aneurysm

Aneurisma gigante de artéria coronária direita

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ABSTRACT – Right coronary artery aneurysms are rare and may result from severe coronary disease, with few cases described in the literature. Mortality is high, and therapy is still controversial. We report the case of a 72-year-old woman with arterial hypertension, and a family history of coronary artery disease, who evolved for 2 months with episodes of palpitations and dyspnea on moderate exertion. During the evaluation, a giant aneurysm was found in the proximal third of the right coronary artery. The patient underwent surgical treatment with grafting of the radial artery to the right coronary artery and ligation of the aneurysmal sac, with good clinical course.

Keywords: Coronary aneurysm; Coronary thrombosis; Coronary artery disease

RESUMO – O aneurisma de artéria coronária direita é raro, podendo resultar de doença coronariana grave, com poucos casos descritos na literatura. A mortalidade é elevada, e a terapêutica ainda é controversa. Relatamos o caso de uma paciente de 72 anos, portadora de hipertensão arterial, história familiar para doença arterial coronária, evoluindo há 2 meses com episódios de palpitações e dispnéia aos moderados esforços. Durante a avaliação, foi constatado aneurisma gigante em terço proximal de artéria coronária direita. A paciente foi submetida a tratamento cirúrgico com realização de enxerto de artéria radial para coronária direita e ligadura do saco aneurismático com boa evolução.

Descritores: Aneurisma coronário; Trombose coronária; Doença da artéria coronariana

INTRODUCTION

A coronary artery aneurysm is a rare condition. Generally, coronary artery aneurysms are multiple, and coronary atherosclerosis accounts for more than 50% of the cases diagnosed in adults. The most affected sites are the proximal and middle portions of the right coronary artery (RCA) and the proximal portion of the anterior descending and circumflex coronary arteries.^{1,2}

There is no universally accepted definition of a giant coronary aneurysm. Although aneurysms secondary to Kawasaki's disease have received a different classification, aneurysms above 8mm are likewise considered as giant aneurysms.³ Furthermore, coronary artery diameters of 20mm, 40mm, 50mm, or four times greater than the reference-vessel diameter have been proposed as diagnostic criteria in the medical literature.⁴

CASE REPORT

A 72-year-old white woman, born in the inland of the state of Minas Gerais, with hypertension (HTN), signs of left ventricular hypertrophy, and a positive family history for coronary atherosclerotic disease (CAD), underwent a 12-lead electrocardiogram, which showed sinus rhythm, normal QRS axis and no changes in the ST segment and/or T wave. The transthoracic echocardiogram showed good ventricular function (left ventricular ejection fraction – LVEF 67%), with no segmental changes at rest, and a grade I diastolic dysfunction, in addition to an image described as a possible pericardial cyst adjacent to the right cardiac chambers, associated with a mild pericardial effusion (Figure 1).

In view of the diagnostic doubt, a chest tomography was performed, which showed global cardiomegaly, with a saccular formation adjacent to the right atrium, measuring

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6.2x4.9cm, which had contrast media in its interior, similarly to the other chambers. Peripheral calcifications and an apparent solution of continuity adjacent to the right chamber were also noted, in addition to a mild pericardial effusion (Figure 2).

Aiming at the best diagnostic confirmation and with the intention of conducting a therapeutic assessment, an invasive coronary stratification was indicated, which confirmed an image suggestive of a large aneurysmatic dilation in the proximal third of the RCA. Due to the large size of the aneurysm, it was not possible to adequately assess anatomical relationships or its dimensions. Finally, a computed tomography angiography of the coronary arteries was performed, which confirmed a giant saccular aneurysm originating from the proximal and middle thirds of the RCA

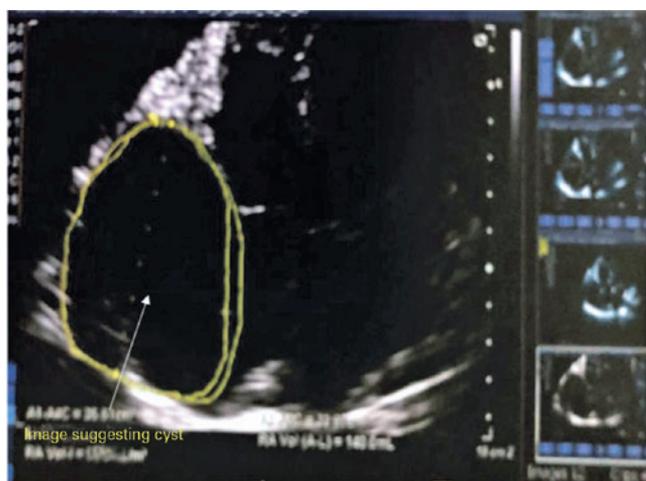


Figure 1. Transthoracic echocardiogram in a two-dimensional imaging protocol in the apical four-chamber window, showing a saccular image adjacent to the right atrium.

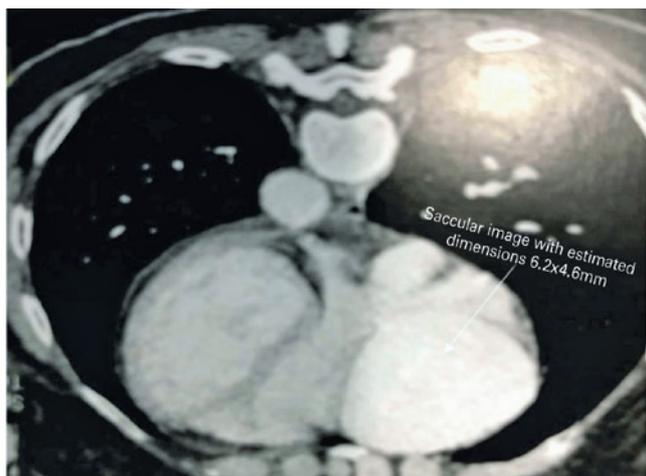


Figure 2. Chest tomography in mediastinal window with visualization of an important aneurysmal dilation in the topography of the right coronary artery.

and an important contiguous relationship with the right atrium (Figure 3).

The therapeutic strategy adopted, in view of the large aneurysmal dilation and the impossibility to characterize its neck, was surgical treatment. As an intraoperative finding, it was found that the giant aneurysm originated from an acute marginal branch of the RCA and was adhered to the right atrium. The surgeon's choice was to perform the proximal and distal ligation of the aneurysmal sac and to empty it under direct vision, followed by a radial artery graft to the proximal portion of the RCA. Therefore, the aneurysmal sac was not excised, rendering it impossible to send a specimen to the pathological anatomy laboratory (Figure 4). The radial graft was chosen based on its patency rate, which is significantly better than the patency rate for vein grafts. The patient had a good clinical course, with a hospital stay of 4 days, and is currently asymptomatic.

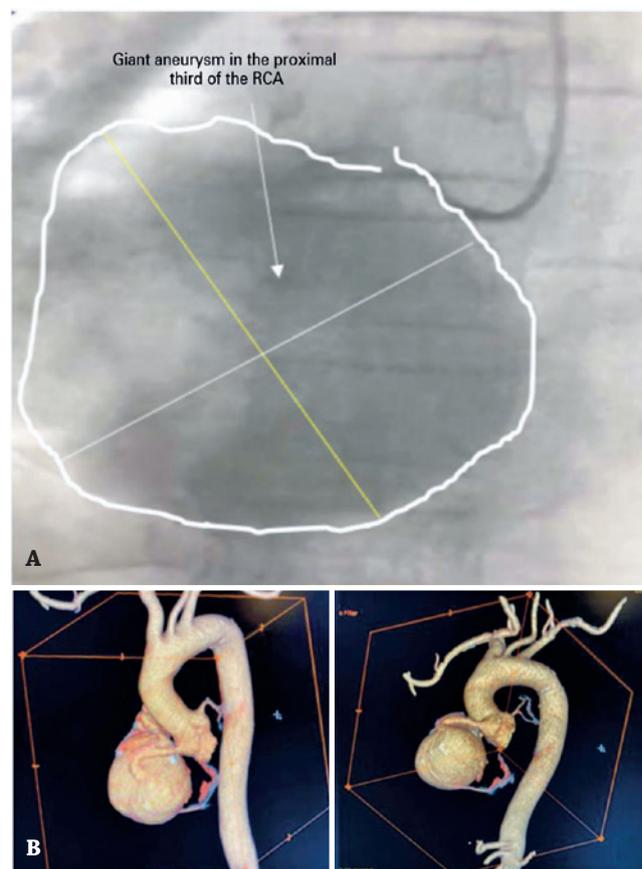


Figure 3. Anatomical assessment of the aneurysm. (A) Coronary angiography of the right coronary artery showing significant aneurysmatic dilation in its proximal third. (B) Three-dimensional reconstruction of the computed tomography angiography with confirmation of an aneurysmatic dilation in the proximal third of the right coronary artery. RCA: right coronary artery.

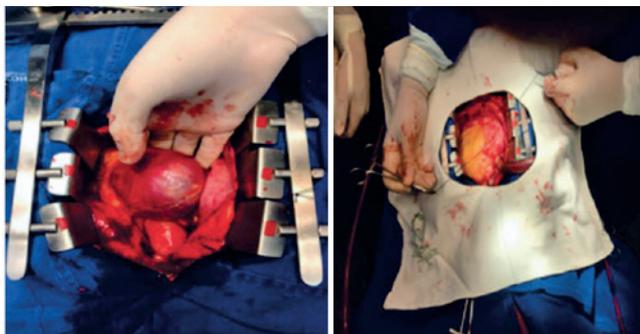


Figure 4. Median sternotomy, extracorporeal circulation and exposure of the giant aneurysmal sac in the right coronary artery, followed by successful ligation of the aneurysmal sac and preparation of the radial artery graft.

DISCUSSION

Coronary aneurysms consist in a coronary artery segment with a diameter 1.5-fold greater than the normal diameter.^{5,6} Kawasaki disease is the most common cause of coronary aneurysm in the world, especially in children and women. In the United States, the main cause is atherosclerotic disease. Aneurysms can be fusiform or saccular, are predominant in males, and their prevalence in the literature varies between 0.15% and 4.9% in patients undergoing coronary angiography.^{5,6} The histologic study reveals diffuse hyalinization, lipid deposits, rupture of intima, medium calcification, focal fibrosis and intramural hemorrhage.⁷ These areas, even if not associated with stenosis, are subject to spasms, thrombosis, embolisms and spontaneous dissections, which are potential causes of acute coronary syndromes.⁸ Patients with coronary artery aneurysms have a higher prevalence of family history of coronary heart disease, HTN, previous acute myocardial infarction and spasms, compared to the control group. Wagdi et al.⁹ performed the first assessment of patients with coronary aneurysms and observed that patients without obstructive coronary disease, but with aneurysms, had a higher prevalence of HTN. They also observed a mortality rate of 15% in 2 years, which is equivalent to the mortality rate of patients with clinically treated triple-vessel coronary artery disease. There are few surgical technique descriptions for the treatment of coronary artery aneurysms, and controversies remain as to which is the best therapeutic option.^{10,11}

Some authors recommend revascularization of the anterior descending and circumflex arteries, with a concomitant distal ligation of the dilated segment, to prevent embolization, enlargement or possible rupture of the aneurysm in cases of left main coronary artery involvement. In the case of RCA aneurysms, there is no consensus on which

would be the best option, considering variables such as the size of the aneurysmal sac, anatomical relationships and the experience of the surgical team.

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None.

DECLARATION OF CONFLICTS OF INTEREST

The authors declare there are no conflicts of interest.

CONTRIBUTION OF AUTHORS

Conception and design of the study: AVB e RB; data collection: DOB; data interpretation: AVB e SRB; text writing: AVB e FN; approval of the final version to be published: AVB e RS.

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