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GIANT RIGHT CORONARY ARTERY ANEURYSM. CASE REPORT

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Palabras clave: Aneurisma coronario; Enfermedad coronaria; Angina de pecho; Isquemia; Anomalías inducidas por medicamentos.

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RESUMEN

Introducción. La presentación de aneurismas coronarios es rara, sin embargo se asocian al abuso de drogas; su sintomatología depende de la anatomía coronaria. Se presenta el caso de un síndrome coronario agudo asociado a un aneurisma gigante de la arteria coronaria derecha.

Presentación del caso. Paciente masculino de 40 años con antecedente de consumo de heroína y crack desde los 20 años, quien consultó por disnea, angina estable y diaforesis. El electrocardiograma evidenció supradesnivel del segmento ST en cara inferior y elevación de troponinas, por lo que se realizó cateterismo coronario que reveló aparente fístula aorto-atrial derecha no concluyente. Dados los hallazgos, se decidió realizar angiotomografía y resonancia magnética que mostraron aneurisma gigante de arteria coronaria derecha. Se realizó resección de aneurisma con circulación extracorpórea, canulación femoral, hipotermia moderada, pinzamiento aórtico y cardioplejia, y se revascularizó la arteria coronaria derecha con vena safena interna izquierda. El paciente tuvo posoperatorio satisfactorio y se le dio de alta a los 7 días.

Conclusiones. El tamaño del aneurisma puede dificultar su diagnóstico, por lo que estudios complementarios son útiles para establecer un diagnóstico diferencial. El abordaje quirúrgico adecuado permite realizar una resección completa del aneurisma y una revascularización coronaria óptima.

ABSTRACT

Introduction: Coronary aneurysms are rare and are linked to drug abuse; symptomatology depends on the coronary anatomy. This is a case of acute coronary syndrome associated with a giant right coronary aneurysm.

Case description: A 40-year-old male, with history of heroin and crack use since age 20, attended consultation due to dyspnea, stable angina and diaphoresis. An electrocardiogram showed ST segment overlay on the underside and troponin problems. A coronary catheterization was performed, which revealed apparent inconclusive aorto-to-right atrium fistula. Based on the findings, angiotomography and magnetic resonance imaging were performed, finding a giant right coronary aneurysm. The aneurysm was resected using extracorporeal circuit, femoral cannulation, moderate hypothermia, aortic cross-clamping and cardioplegia, and the right coronary artery was revascularized with the left internal saphenous vein. The patient had a satisfactory postoperative period and was discharged after 7 days.

Conclusion: There is an important association between drug use and the development of coronary aneurysms. Aneurysm size makes diagnosis difficult, so complementary studies are necessary to establish a differential diagnosis. An appropriate surgical approach allows for a complete resection of the aneurysm and optimal coronary revascularization.

INTRODUCTION

According to Halapas *et al.* (1), a coronary artery aneurysm (CAA) is giant when its dilation exceeds the diameter of the patient's largest blood vessel by four times its normal size or when, according to Jha *et al.* (2), it has a diameter of 2 cm. The incidence of CAAs is estimated between 0.3% and 5%, while giant coronary artery aneurysms are found in only about 0.02% of the cases. (3)

CAA is classified as either congenital or acquired (atherosclerotic and non- atherosclerotic) (4) and may be associated with coronary fistulas. (5) Other conditions that can cause these aneurysms are vasculitis, Kawasaki disease, systemic lupus erythematosus, Lyme disease, trauma, drug abuse (such as cocaine), iatrogeny, and infections such as Epstein Barr virus and syphilis. (6,7) CAA formation as a result of cocaine use is often associated with severe episodic hypertension and vasoconstriction with a direct predisposition to endothelial damage. Likewise, aneurysmal disease may be related to underlying atherosclerosis. (8)

Most CAAs are asymptomatic, but up to one-third of cases may present with angina, myocardial infarction, sudden death, and congestive heart failure. (1)

Cardiac catheterization remains the gold standard for diagnosing CAAs. (9) However, CT angiography is a non-invasive, fast and relatively inexpensive technique, available in most health centers, which allows making 2D-3D anatomical reconstructions. (10)

The overall 5-year survival rate of patients with CAAs is 71% (8), but there is no strong evidence on treatment recommendations due to the lack of randomized control trials. Thus, establishing the need for medical treatment, implanting a stent or surgical exclusion of the

CAA depends on the symptoms, etiology, and associated lesions. (1)

CASE PRESENTATION

A 40-year-old, mestizo, Mexican, middle-income businessman with a history of drug use for the last 20 years (heroin and crack) and no personal or family history of cardiovascular disease, attended consultation due to symptoms of 15 days of evolution characterized by dyspnea of medium effort, stable angina that did not respond to analgesics, and diaphoresis associated with his usual physical activity.

On physical examination, the patient was hemodynamically stable with no audible murmurs on auscultation. The electrocardiogram was consistent with inferior infarction, ST-segment depression of 0.5 mm, and positive measurement of troponin T. Therefore, the patient was successfully treated with thrombolysis and his symptoms resolved. Adequate criteria for reperfusion were obtained.

Coronary angiography was performed and the results suggested an inconclusive aorta-to-right atrium fistula. A coronary angiotomography and magnetic resonance imaging showed a giant aneurysm of the right coronary artery of 12.5x9.4x9.9cm in diameter, and ruled out aorta-to-right atrium fistula (Figures 1 and 2). Similarly, a transthoracic echocardiogram was performed, which revealed a 60% left ventricular ejection fraction with anterior wall akinesia, without altering the functioning of its valves.

Once the definitive diagnosis was established and based on the hemodynamic stability of the patient, it was decided to schedule the resection of the giant right coronary artery aneurysm plus coronary revascularization with saphenous venous graft.

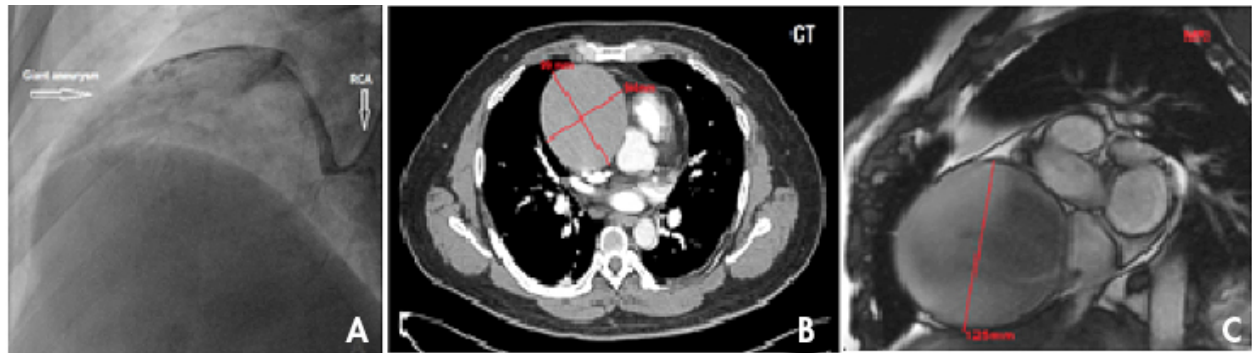


Figure 1. Imaging studies showing giant aneurysm of the right coronary artery A) Coronary Angiography; B) Axial Computed Angiotomography; C) Nuclear Magnetic Resonance.

Source: Document obtained during the study.

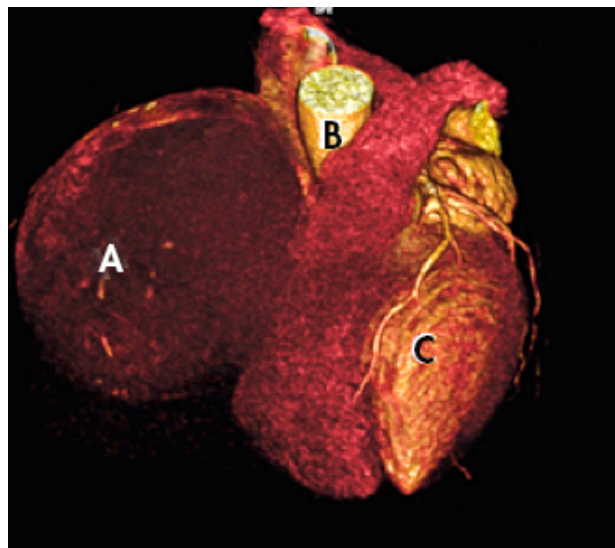


Figure 2. Tomographic reconstruction. A) Giant aneurysm of the right coronary artery; B) Aorta; C) Left ventricle.

Source: Document obtained during the study.

Surgical resection with femoral arterial and venous cannulation was chosen due to the large size of the aneurysm. Antegrade crystalloid cardioplegia solution was administered, the aneurysm was resected and the distal and proximal coronary lumen was properly closed with 4-0 polypropylene suture with Teflon® bands. Right coronary artery revascularization was performed with left saphenous vein graft and

the edges of the aneurysm wall were sutured to avoid major bleeding. Adequate weaning of the extracorporeal circuit was completed and no complications were observed.

The patient was discharged 7 days after surgery without apparent enzymatic changes and with electrocardiogram and echocardiogram results without alterations (Figures 3, 4 and 5).

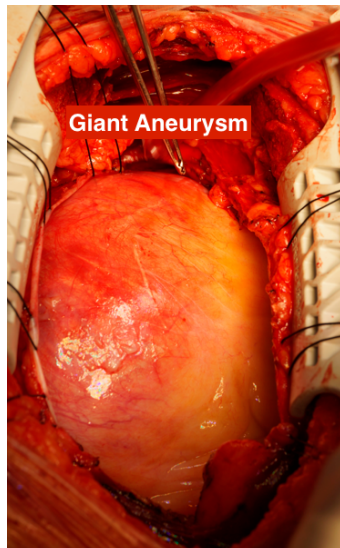


Figure 3. Surgical procedure: Giant aneurysm of the right coronary artery.
Source: Document obtained during the study.

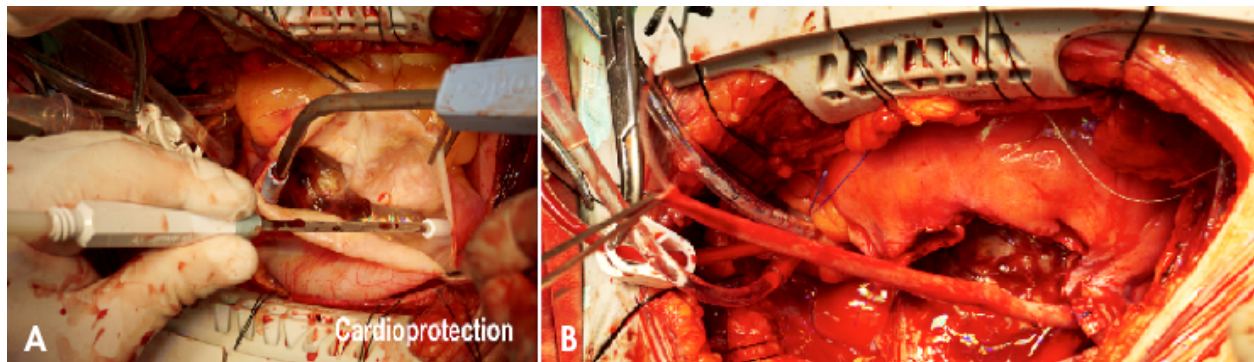


Figure 4. A) Resection of aneurysm of the right coronary artery. B). Right coronary artery revascularization
Source: Document obtained during the study.

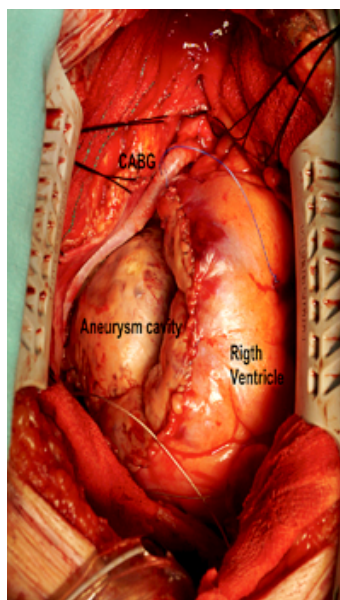


Figure 5. Outcome of surgical procedure
Source: Document obtained during the study.

DISCUSSION

A CAA is defined as “giant” when its size is bigger than 8mm or when it exceeds by 4 times the patient’s largest blood vessel. This type of aneurysm is rare and may occur in 0.3-5% of patients undergoing coronary angiography. (2)

Satran *et al.* (8) report the correlation between coronary aneurysms and cocaine use and point to hypertensive episodes, vasoconstriction (which produces direct endothelial damage), accelerated atherosclerosis and related factors that increase the possibility of developing aneurysmal dilations as mechanisms involved in the development of this pathology.

The study by Mittleman *et al.* (11) was the first to demonstrate a significant increase in the risk of acute myocardial infarction in cocaine users. Cocaine is a drug that increases platelet aggregation and thrombosis and promotes transient erythrocytosis; in addition, its vasoconstrictive effects are found in both dysfunctional and histologically normal endothelium. (12-16)

The symptoms reported by this patient were ambiguous and possibly attributable to multiple pathologies related to the cardiovascular system. Therefore, it is essential to make a differential diagnosis that considers the following as possible causes: aneurysm of sinus of Valsalva, pseudoaneurysm of the aortic sinus and aneurysm of the right coronary artery, the latter being the definitive diagnosis in the present case. (9) The large size of the reported patient’s CAA could have had a mechanical impact on the right heart chambers with a high probability of rupture, a fatal outcome, and ischemic effects due to turbulent flow and thrombosis that may be present in the aneurysmal sac secondary to blood stasis.

The natural history and prognosis of these patients are not clear because of the low prevalence of this entity, so diagnosis and management must be timely. Treatment of giant coronary artery

aneurysms must take into account size, location, relationship to adjacent structures and hemodynamic involvement. Expectant medical treatment and stenting have been described as management techniques, and its surgical approach consists of ligation, ablation and myocardial revascularization.

CONCLUSIONS

The present case is of interest due to the large size of the aneurysmal sac, one of the largest reported in the literature; this is relevant since the aneurysm size can make its diagnosis difficult, so complementary studies are useful to establish a differential diagnosis. The clinical presentation of CAA is striking and leads to a large number of differential diagnoses, which can be excluded through complementary studies.

The surgical technique used to resolve the giant aneurysm of the right coronary artery in this case showed the basic characteristics for good exposure, cardiovascular protection, approach and resolution without complications.

ETHICAL CONSIDERATIONS

This article followed all the corresponding ethical standards for case reports, and informed consent was obtained in order to disclose the patient’s information.

CONFLICT OF INTEREST

None stated by the authors.

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