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An Incidental Discovery of a Left Main Coronary Artery Aneurysm

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Abstract **Case Report**

The left main coronary artery aneurysm is a rare disease caused mainly by atherosclerosis. It is usually an incidental finding during coronary angiography but can manifest itself with ischemic heart disease symptoms. In our paper, we present the case of a polyvascular patient who benefited from a coronary angiography in the context of the etiological workout of his dilated cardiomyopathy, which lead to the discovery of a large left main coronary artery aneurysm associated with two-vessel coronary disease. Through our paper, we aim to discuss the different aspects of this condition and its different treatment options.

Keywords: Left main coronary artery, aneurysm, coronary angiography.

INTRODUCTION

Coronary artery aneurysm (CAA) or ectasia is a rare disease typically defined as an abnormal dilation of the coronary vessel lumen, exceeding the diameter of the normal artery, by more than 150% [1].

Its incidence varies between 0.3% and 5.3% with a mean incidence estimated at 1.65%. Left main coronary artery aneurysms are extremely rare with an incidence estimated at 0.1%. It is usually asymptomatic and incidentally identified in an angiography realized for other purposes. The main cause of coronary aneurysms is atherosclerosis in adults and Kawasaki disease in adolescents and children [2, 3].

Here we report the case of a patient who presented with dilated cardiomyopathy whose coronary angiography showed an aneurysm of the left main coronary artery associated with multiple vessel disease.

CASE PRESENTATION

A 66 years-old male with a history of right superficial femoral artery stenosis, and aneurysm of the abdominal aorta was admitted to carry out the etiological workup for a dilated cardiomyopathy managed medically, under bisoprolol, aspirin, and atorvastatin.

The twelve-lead electrocardiogram showed a left deviation heart axis and negative T waves in inféro-lateral leads. Coronary angiography was performed, showing a two-vessel coronary disease with significant stenosis of the distal part of the LMCA and an aneurysm of the median part of the same artery (Figure 1). The right coronary artery was affected by significant stenosis of the proximal and median parts of the vessel (Figure 2). A cardiac computed tomography (CT) scan was performed to illustrate the margin between the LMCA and its two branches and study the feasibility of angioplasty with a covered stent (Figures 3 and 4).

The therapeutic decision of this CAA was challenging. The margin between the LMCA and its branches was narrow, where the exclusion of the aneurysm with a covered stent may interrupt the flow to one of the two branches of the LMCA leaving the surgical treatment as the sole logical course of action.

Surgical treatment was not pursued during hospitalization in the absence of acute context. It was decided to treat the aneurysm surgically after cardiac MRI to study the viability of the myocardium.

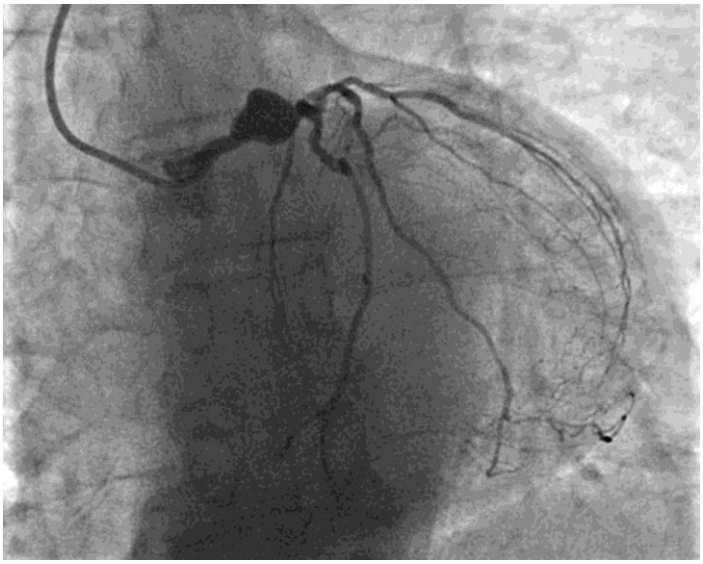

Figure 1: Front angiographic view of the left coronary artery showing the aneurysm of the LMCA and the significant stenosis of its distal part

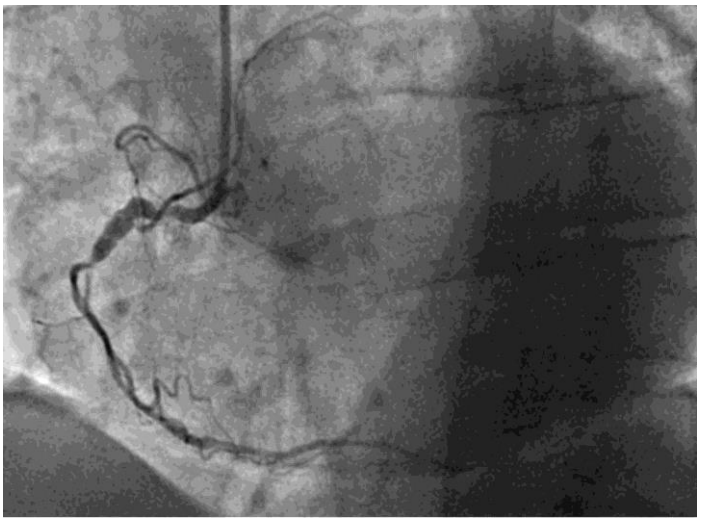

Figure 2: Right coronary angiogram in left anterior oblique view showing significant stenosis of the proximal and median parts of the artery

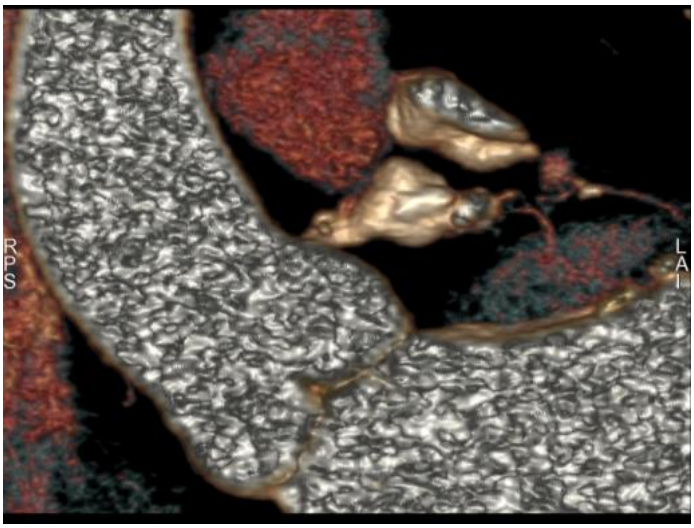

Figure 3: CT scan reconstruction showing the LMCA aneurysm

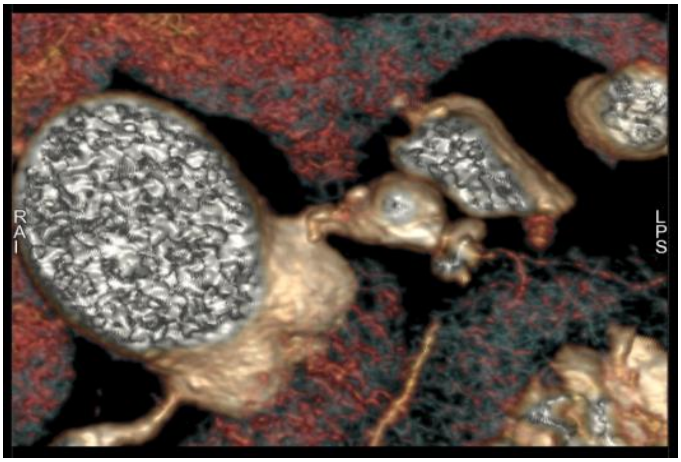

Figure 4: CT scan image showing the aneurysmal dilation of the LMCA

DISCUSSION

The left main coronary artery aneurysm (LMCAA) is an exceedingly rare entity usually associated with multiple vessel coronary disease. It varies in size and can be "small" and localized to LMCA or extend to other major branches of the LMCA: left anterior descending and circumflex arteries. Large LMCAA is defined as an aneurysm exceeding 30 mm in length or 15 mm in height, or both, and extending into other major coronary arteries (CA) [5].

CAA may be focal or diffuse, saccular, or fusiform. Some authors prefer to define aneurysms as limited dilation of the CA and reserve the term ectasia for diffuse dilation exceeding 50% of the coronary vessel [1, 6].

Markies *et al*., proposed a classification of this anomaly in four types based on the number of arteries affected and the localized or diffuse character of the dilation [7]:
Type 1: Diffuse ectasia of two or three major vessels,
Type 2: Diffuse disease in one vessel and localized disease in another vessel,
Type 3: Diffuse ectasia of one vessel only,
Type 4: Localized or segmental involvement of coronary arteries.

Researchers couldn't identify specific signs or symptoms of CAA. The most common presentation is ischemic heart disease symptoms, from stable angina to myocardial infarction. Risk factors for developing CAA seem to be independent of coronary risk factors or left ventricular dysfunction and correlate with abdominal aorta aneurysms and arterial hypertension. The association of Kawasaki disease or connective tissue disorders with chest pain is very suggestive of the anomaly and must direct further investigations [1].

Coronary angiography is the gold standard for the diagnosis of CAA, it also helps to precise the shape, location, size, the presence of a thrombus, the number of arteries involved, and establishes a basic status of the coronary arteries.

Echocardiography can be helpful in exploring the proximal segments of the CA. Some authors emphasize the contribution of advanced imaging techniques such the magnetic resonance and multi-slice computed tomography in diagnosing the anomaly [1].

The most common etiology of CAA is atherosclerosis and congenital heart disease responsible for more than 50% and 30% of the cases respectively. Moreover, inflammatory and connective tissue disorders have been well known to cause the disease, with the most described association is with Kawasaki disease, however, the anomaly has been described in association with Takayasu's arteritis, lupus, rheumatoid arthritis, Marfan syndrome, Ehlers-Danlos syndrome, Behcet's disease… CAA could also be caused by infections such as HIV and syphilis, drug use, trauma, or coronary interventions [6].

The natural history of CAA is not well elucidated. The most described complications of the disease are thrombosis, distal embolization, rupture of coronary aneurysms, arteriovenous fistulae, and vasospasms, all with the potential to cause ischemic heart disease and sudden death [8].

There is no clear consensus regarding the treatment of CAA considering the lack of controlled trials.

Medical treatment is usually dictated by the etiology and aims to decrease the thrombotic potential of the anomaly. The use of nitrates seems to aggravate ischemic heart disease via a mechanism called "dilated coronaropathy ".

Curative treatment is based on the removal of the aneurysmal area of the artery, using one of two methods: surgery or angioplasty. The conservative method is preferred (on the account of the limited

DATA) in high-surgical risk patients and for patients with aneurysms that are inferior to 10 mm in diameter [1, 6].

Percutaneous treatment of CAA consists of the exclusion of saccular aneurysms and small pseudoaneurysms with covered stents. CAA that involves a major side branch can be treated with balloon or stent-assisted coil embolization [9].

The treatment of choice for LMCA aneurysms is surgical resection considering the difficulty of posing a covered stent in this location without interrupting the blood flow in one of the branches [9].

Surgical treatment of CAA may include aneurysm ligation or marsupialization with interposition graft, however, the most frequent technique consists in opening the CAA and suturing its afferent and efferent vessels and finishing with bypass grafting if necessary [9].

CONCLUSION

Left main coronary artery aneurysm is an exceptional incidental coronary angiography finding. It is often associated with atherosclerotic lesions of coronary arteries in adults. Coronary angiography is the gold standard for the diagnosis of this anomaly. The treatment of CAA can be medical, surgical, or instrumental, and it is subject to multiple controversies in the absence of a clear consensus.

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