

A Coronary Artery Aneurysm with a Large Subepicardial Ischemia in a Patient Undergoing a Valvular Heart Surgery: Should a Coronary Artery Bypass be Combined or Not? A Case Report

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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Case Study

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ABSTRACT

Coronary artery aneurysm (CAA) is a rare coronary disease defined as a dilation of a coronary artery 1.5 times or more its normal size. It is often revealed by an acute myocardial infarction however sometimes it can be completely asymptomatic. Because of the relative rarity of this disease, there is no consensus on its management options and controversy persists regarding the use of medical or surgical modalities. The study reports an unusual case of a CAA associated with a large subepicardial ischemia discovered incidentally in a patient undergoing surgery for severe mitral stenosis. The aim of this case report is to show the unusual association between coronary artery aneurysm and mitral stenosis, and to discuss the therapeutic management of coronary artery aneurysm in such an association, thereby demonstrating the necessity of elaborating recommendations for the management of coronary artery aneurysm.

Keywords: Coronary artery aneurysm; heart surgery; management; large subepicardial ischemia.

1. INTRODUCTION

“Coronary artery aneurysms (CAA) is an uncommon condition that is defined as a localized saccular or fusiform dilation of a coronary artery that is larger than the diameter of the normal vessel adjacent segment by 1.5–2 times” [1]. It is found in up to 5% of patients undergoing coronary angiography [2]. In contrary Ectasia is used to describe a diffuse dilation that involves at least 50% of the length of the artery [3]. The case that we present is an aneurysm of the proximal left anterior descending artery associated with a severe mitral stenosis. The aim of this work is to show the unusual association between coronary artery aneurysm and mitral stenosis, and to discuss the therapeutic management of coronary artery aneurysm in such an association, thereby demonstrating the necessity of elaborating recommendations for the management of coronary artery aneurysm.

2. CASE PRESENTATION

A sixty three (63) years old man with no modifiable cardiovascular risk factors and no particular medical history was admitted to our center with complaint of dyspnea and palpitations. Physical examination found a blood pressure of 120/65 mmHg, a pulse rate of 60

beats per minute, with an irregular heart rhythm and a normal body temperature. The electrocardiogram revealed an atrial fibrillation, a low voltage QRS and negatives T waves (Fig. 1). The transthoracic echocardiography showed a severe mitral stenosis associated with an important tricuspid regurgitation, a normal left ventricle systolic function with no wall motion abnormalities (Fig. 2). As part of the preoperative assessment, a coronary angiography was performed that showed an aneurysm of the left anterior descending artery with a low flow. There was no atheromatous lesion. The right coronary artery and the left circumflex artery were normal.

i would like to add this paragraph at the end of my case presentation :

Beside the valve surgery, the decision of the multidisciplinary team was to respect the aneurysm and to use medical treatment based on antiplatelet therapy .

A week later, and after this preoperative assessment, the patient underwent a surgical mitral valve replacement. The outcomes after surgery were good and the patient was discharged under anticoagulation with vitamin K antagonist (VKA) with a target international normalized ratio (INR) between 2.5 and 3.5.

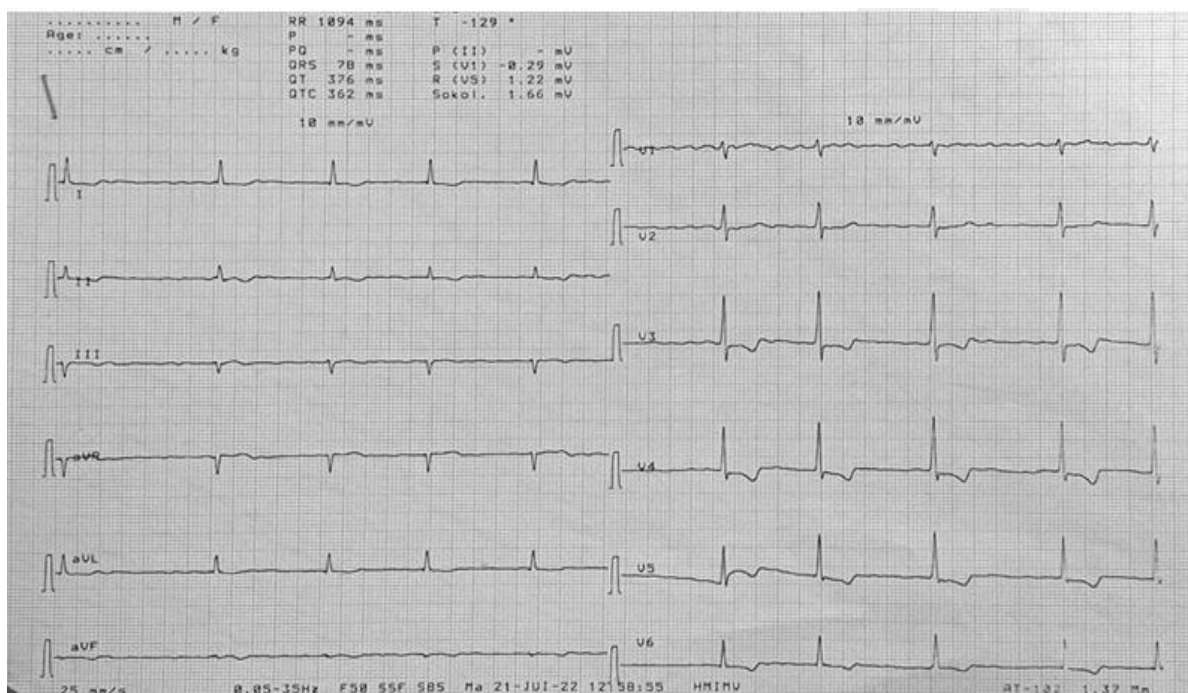


Fig. 1. ECG showing a low voltage, negatives T waves and an AF



Fig. 2. Aneurysm of the left anterior descending artery

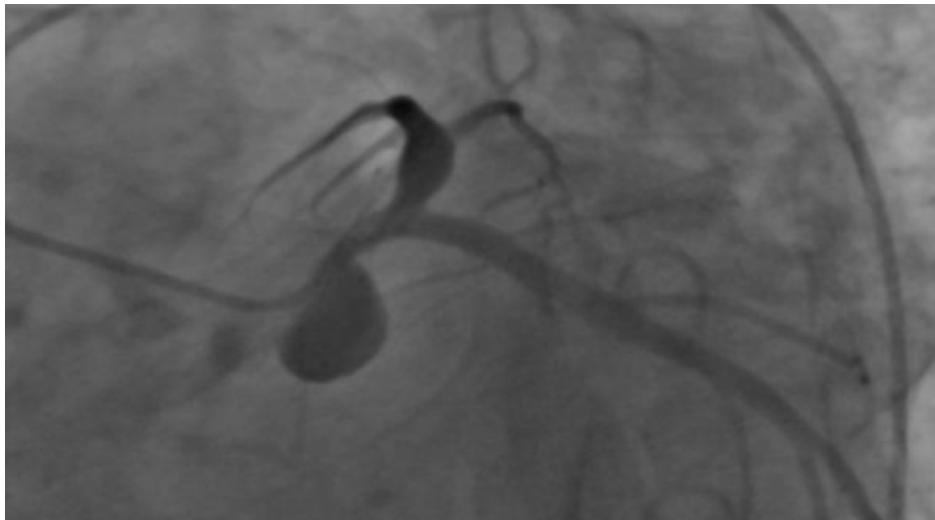


Fig. 3. Aneurysm of the left anterior descending artery with a low flow

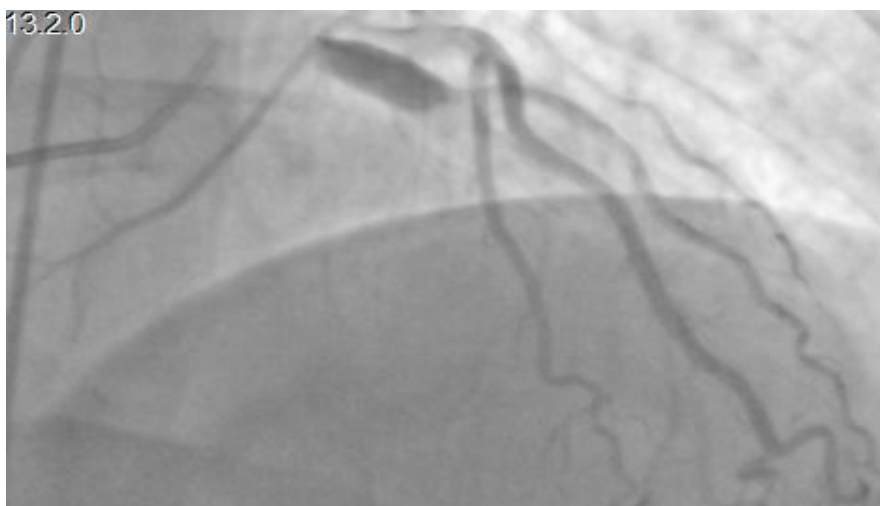


Fig. 4. Aneurysm of the left anterior descending artery with a low flow

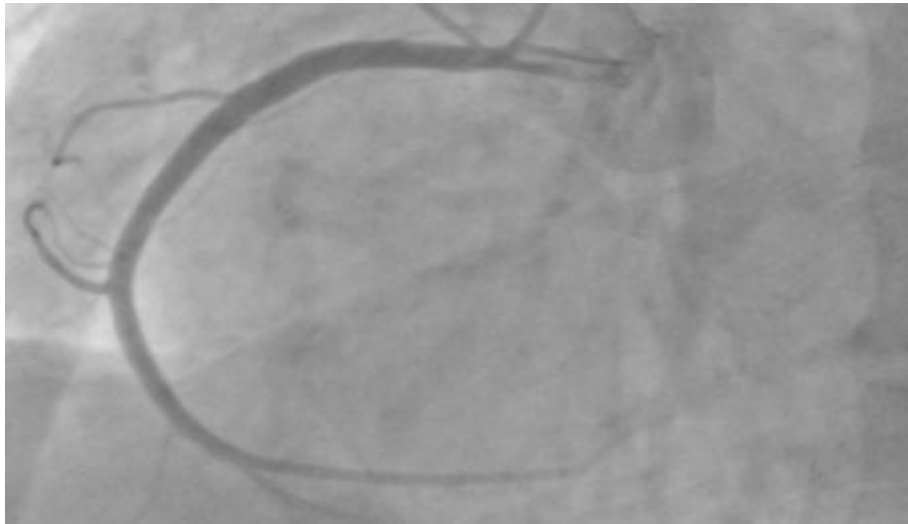


Fig. 5. The right coronary artery

3. DISCUSSION

“The reported incidence of coronary aneurysms ranges from 0.3% to 5%, with predilection to men more than women. And it is most commonly diagnosed in late middle-aged patients” [2,4,5]. “The right coronary artery is usually the most affected artery (40%) especially the proximal and middle segments followed by the left anterior descending artery, the left circumflex artery and at last the left main coronary” [6]. The left anterior descending artery was the one involved in our case. Physiopathology of CAA is not well established but it is always associated with destruction of the media [4]. Atherosclerosis is the most common cause (50%) followed by congenital heart disease, and Kawasaki in Asian countries [7]. Other aetiologies can be found such as traumatic post coronary intervention, syphilis, Borrelia, auto immune vasculitis (Behçet ...) or connective tissue disease (Marfan, Ehler-Danlos). In our case, atherosclerosis was excluded by coronary angiography and other aetiologies mentioned above were ruled out by history taking, clinical examination, and laboratory tests. However the association with a mitral stenosis raises the question of any correlation between mitral stenosis and coronary aneurysm. Such an association is not classically described. However our literature search found one isolated case of this association reported by Mohammad Masoumi et al. [8]. There are no clinical symptoms specific to coronary artery aneurysms. CAA can be revealed with symptomatic acute coronary syndrome, stable angina... However patients with CAA can be completely asymptomatic, and it can be

discovered incidentally during angiography when performed for silent ischaemia or a preoperative check up. In our case, there was no chest pain but a sub-epicardial ischemia.

“The optimal therapy for patients with the coronary artery aneurysm is unknown and controversy persists regarding the use of medical or surgical modalities” [2].

However most authors agree that invasive therapy such as surgical exclusion of the CAA should be reserved for patients with significant coronary stenosis or those with large CAA.

Percutaneous treatment with covered stent placement have also been used as non-surgical alternative in patients with prohibitive surgical risk.

“Conservative or medical management is preferred for small asymptomatic coronary aneurysms. These patients are treated with antiplatelet therapy, anticoagulation to decrease the risk of thromboembolic complications along with the control of cardiovascular risk factors” [9].

Through out the literature the cases of patients with CAA undergoing a cardiac surgery were rarely reported. And this becomes necessary to discuss particularly when the CAA is responsible of a large sub-epicardial ischemia like the case of our patient.

V. Pham et al discussed the management of the CAA and suggested a surgical exclusion of the CAA when a concomitant surgery is indicated [7].

In our case, it was clear that the electrical abnormalities in such a large territory are due to the CAA making it unnecessary to undergo any functional ischemia test. This is explained by the stagnation of blood in the CAA compromising

the perfusion of the downstream territory. For the treatment, the decision of the multidisciplinary staff was to use medical therapy even though the patient had a valvular heart surgery.

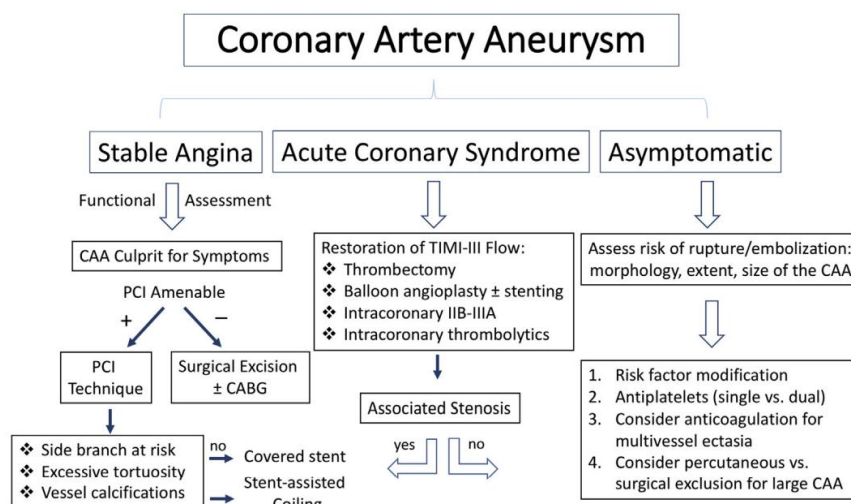


Fig. 6. A Suggested algorithm for management of patients with CAA (2)

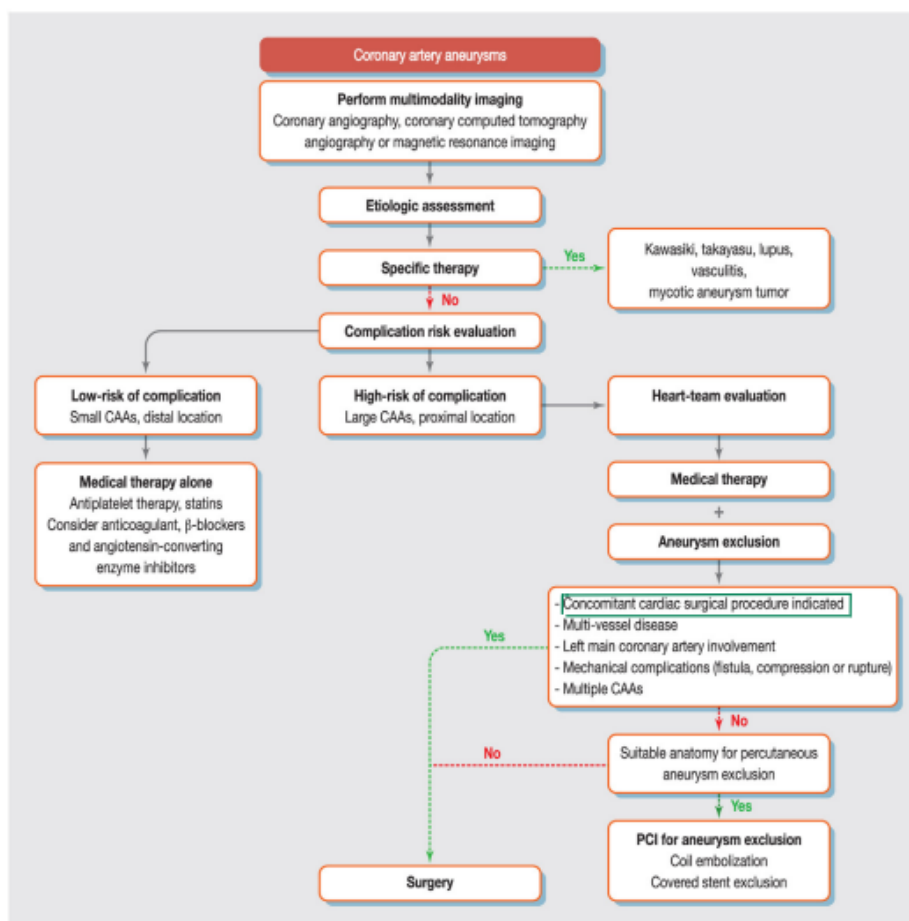


Fig. 7. An algorithm suggested by V. Pham et al. for the management of coronary artery aneurysm (CAA)

4. CONCLUSION

Patients with CAA are usually asymptomatic but sometimes they can present with symptoms of coronary artery occlusion. The atherosclerosis is the most common cause. The optimal therapy for patients with the CAA is unknown. Recommendations become necessary to standardize the management of CAA in general and especially when it's associated with an indication of a heart surgery.

CONSENT

As per international standard or university standard, patient(s) written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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