Journal of
Cardiology & Cardiovascular
Surgery

Case Report

DOI: 10.51271/JCCVS-0008

Left main coronary artery aneurysm: a rare case report

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Cite this article: Beyazal OF, Karabulut MN, Apaydın K, Yanartaş M, Kayalar N. Left main coronary artery aneurysm: a rare case report. *J Cardiol Cardiovasc Surg.* 2023;1(2):28-30.

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Received: 30/05/2023 ◆ **Accepted**: 27/06/2023 ◆ **Published**: 28/06/2023

ABSTRACT

Left main coronary artery (LMCA) aneurysm is a rare condition and the treatment strategy has not been fully determined. Although usually asymptomatic, myocardial ischemia or infarction may develop or rupture. Antiaggregant therapy should be given to prevent thrombus formation. In appropriate cases, percutaneous methods or surgical strategies can be successfully applied, especially in the case of concomitant coronary artery disease (CAD). We present a case of coronary artery bypass graft performed on a patient with concurrent critical CAD with an aneurysm distal to the LMCA and proximal to the left anterior descending artery.

Keywords: Left main coronary artery, coronary artery aneurysm, coronary artery bypass graft

INTRODUCTION

Coronary artery aneurysms (CAA) are a rare anatomical disorder in which dilation of the coronary arteries to 1.5 times their normal size is seen.[1] The incidence of CAA is approximately 0.15%-4.9%, and involvement of the left main coronary artery (LCMA) is rarer and the right coronary artery (RCA) is most frequently affected.[2] They are usually asymptomatic and are detected during coronary angiography (CAG), intravascular ultrasonography (IVUS), or computed tomography (CT) for cardiac investigation. In symptomatic patients, myocardial ischemia or infarction may develop or rupture.[3] Due to the lack of randomized controlled trials, there is no clear consensus on the treatment strategy. Surgical strategies such as resection, reconstruction, or coronary artery bypass graft (CABG) have been reported in addition to medical treatment and percutaneous interventions.[4] In this case report, we present a case of CABG performed on a patient with concurrent critical coronary artery disease (CAD) with an aneurysm distal to the LMCA and proximal to the left anterior descending artery (LAD).

CASE

A 41-year-old (82 kg) male patient applied to our clinic with complaints of chest pain for the last 3 months. His vital signs were stable, and no pathology was found in his history and laboratory parameters. CAG and coronary computed tomographic angiography (CTA) revealed giant aneurysms distal to the LMCA and proximal to the left anterior descending artery (LAD), and extensive coronary artery disease (**Figure 1, 2**). As a result of transthoracic echocardiography (TTE), the ejection fraction (EF) was 45% and no significant valve pathology was detected. The patient was evaluated multidisciplinary by the heart team and it was decided to perform a coronary artery bypass graft (CABG). After the median sternotomy, a bypass was performed on the LAD and obtuse marginal (OM) arteries using the left internal mammarian artery (LIMA) and saphenous vein grafts. The intermediary artery and right coronary artery were evaluated intraoperatively and were not found suitable for anastomosis. The aneurysmatic segment, on the other hand, was found to be stable, not ruptured, and no thrombotic focus was detected. Cross clamp time was 71 minutes and cardiopulmonary bypass time was 89 minutes. After the operation, there was a total drainage of 300 ml. A total of 1 unit of erythrocyte suspension was used. He was discharged from the intensive care unit on the 2nd postoperative day and was discharged with acetylsalicylic acid 100 mg and atorvastatin 40 mg on the 5th day without any complications. There were no complications in the follow-up of the 1st month postoperatively.

DISCUSSION

CAA is defined as a coronary artery diameter greater than 50% or 1.5 times the reference diameter.[5] It is most commonly seen in RCA, followed by the left circumflex artery (LCx), and LAD, and rarely in LMCA.[6] While the most common cause in adults is atherosclerosis, the most common cause in children and adolescents is Kawasaki disease.[1] It also develops due to trauma, congenital diseases, connective tissue diseases, and some vasculitides.[7]

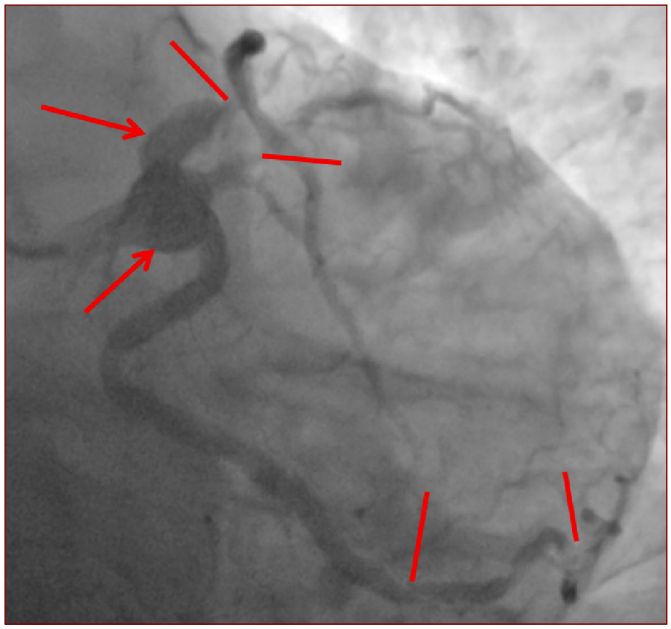

Figure 1. Coronary angiography image. Arrows indicate the aneurysm distal to the left main coronary artery and proximal to the left anterior descending artery. Lines show 80% stenosis after the aneurysmatic segment in the left anterior descending artery, 99% stenosis in the intermediate artery, and 60% and 50% stenosis in the left circumflex artery.

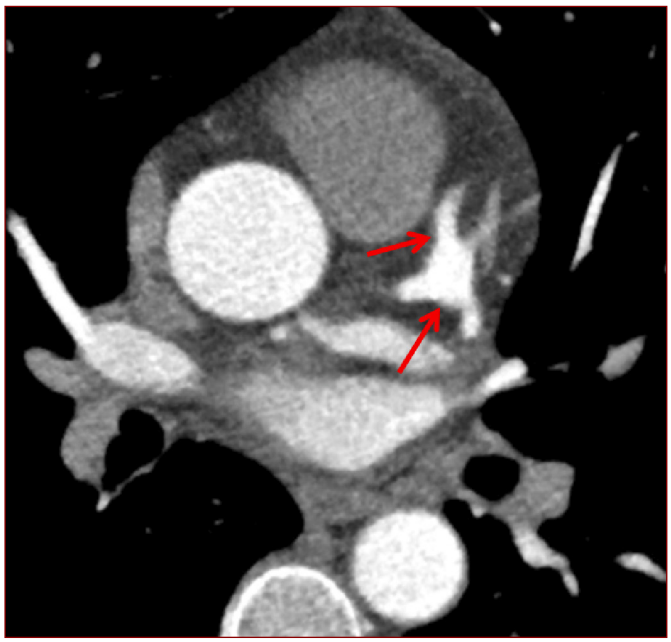

Figure 2. Coronary computed tomographic angiography image. Arrows indicate the aneurysm distal to the left main coronary artery and proximal to the left anterior descending artery.

While CAA can be detected by non-invasive methods such as TTE, CT, and magnetic resonance (MR) imaging, CAG is one of the best methods in terms of better evaluation of anatomy and pathology. However, the disadvantages of CAG are that it only evaluates the blood flow in the lumen, does not provide sufficient information about the vessel wall, and cannot be accurately measured due to occlusion of the aneurysm due to thrombus or plaque.[2] Therefore, in addition to CAG, CTA also plays an important role in diagnosis. In addition to CAG performed in our patient, CTA images also supported the diagnosis and evaluated additional pathologies.

They are usually asymptomatic and detected incidentally. The most common symptom is chest pain. Thrombosis and embolism may be seen due to the deteriorated flow characteristic in the aneurysm. As a result, myocardial infarction may occur. Rupture is rare, but if it develops, it can cause cardiac tamponade. It can also cause arrhythmias by compressing adjacent heart structures such as the right atrium and right ventricle. It can cause sudden death. The presence of CAA is associated with poor long-term prognosis independent of coronary artery disease.[3] In our case, we present a successful CABG operation performed on a patient who presented with chest pain and was found to have an aneurysm in the LMCA and LAD in the CAG and with accompanying critical CAD.

Since there is no known randomized controlled study on this subject in the literature, there is no clear recommendation for treatment in the guidelines. Findings of case reports are important for recommendations. Therefore, this article will contribute to the literature. The type, size, and location of the CAA, the patient's symptoms should be evaluated and the treatment should be individualized. Many methods have been described as medical treatment, percutaneous treatment, and surgical treatment. As a conservative treatment, it is recommended to give antiaggregant and anticoagulant therapy, especially to prevent thrombotic complications.[8] In addition, the use of statins is recommended due to their pleiotropic effects.[3] Similar to these recommendations, we discharged our patient with acetylsalicylic acid and atorvastatin, and we did not experience any complications during the follow-up. It is suggested that last-generation drug-eluting stents (DES) can be preferred as percutaneous treatment.[9] Percutaneous application of polytetrafluoroethylene (PTFE)-coated stents can limit the expansion of the CAA and prevent rupture.[2] In the literature, some methods such as reconstruction, resection, or isolation with concomitant CABG have been described as a surgical strategy.[4] CABG can be performed when necessary by opening the aneurysm, and suturing the afferent and efferent vessels.[10] In terms of surgery, Singh et al.[11] reported good results with proximal ligation and plication of the aneurysm with coronary artery bypass grafting. In our case, we did not intervene in CAA because CAA was not large, had no thrombotic findings, and was stable. However, we decided to perform CABG because the patient had chest pain and accompanying CAD. Then we arranged his medical treatment and discharged him. We follow our patient closely to investigate whether the existing CAA is growing. If growth is detected during the follow-up period, percutaneous intervention or surgery will be re-evaluated.

The fact that there are not many studies on this subject in the literature causes the lack of strong recommendations in international guidelines. Due to their rarity, there are not enough studies with large patient numbers. For this reason, future studies with more numbers will be extremely important in terms of providing guideline information on this subject. Like this article, case reports are also important in terms of comparing different treatment methods and bringing successful results to the literature. In addition, we think that prospective studies to be conducted on how conservatively followed patients will progress in the future will provide invaluable information on this issue.

CONCLUSION

LMCA aneurysm is a rare condition and the treatment strategy has not been fully determined. Antiaggregant therapy should be given to prevent thrombus formation. In appropriate cases, percutaneous methods or surgical strategies can be successfully applied, especially in the case of concomitant coronary artery disease (CAD). However, studies that will provide sufficient evidence for guidelines for optimal management of this issue are needed.

ETHICAL DECLARATIONS

Informed Consent: All patients signed the free and informed consent form.

Referee Evaluation Process: Externally peer-reviewed.

Conflict of Interest Statement: The authors have no conflicts of interest to declare.

Financial Disclosure: The authors declared that this study has received no financial support.

Author Contributions: All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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