

Management of a Large Coronary Artery Aneurysm with Graft-coated Stent during the Acute Phase of Myocardial Infarction

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ARTICLEINFO	ABSTRACT
Article type: Case report	Coronary aneurysms in adults are rare clinical entities. Herein, we presented a 54-year-old man who was admitted with an acute extensive anterior myocardial infarction. The emergency coronary angiography revealed an isolated large aneurysm at the proximal segment of the left anterior descending coronary artery. The patient was successfully treated with a graft-coated stent.
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Introduction

Coronary artery aneurysms (CAAs) describe a localized dilatation of a coronary artery segment more than 1.5-fold the normal size of adjacent normal segments (1). The aneurysms of the coronary arteries are an uncommon disorder, with an estimated prevalence rate of 0.15-4.9% in the patients undergoing coronary angiography in different case series (2). Coronary aneurysms can be congenital or secondary to several etiologies, such as atherosclerosis, Kawasaki's disease, (polyarteritisnodosa, arteritis syphilis, and Takayasu's arteritis), connective tissue diseases (Marfan's and Ehlers-Danlos syndromes). metastatic tumors, and blunt trauma to the chest (3). Many investigators have reported about ACAD,but there are no controlled clinical trials study to evaluate the optimal therapy for those disorder because of their rarity.(4) Medical manangment consists of attempts to prevent thrombotic complications .medical strategies to improve outcomes in vasculitis-induced ACAD involve the use of immunosuppressive therapy to subside the inflammatory process related to primart disease.Because inhibiting power of statins and corticosteroids over elevated MMP-3 levels(contributes to the development of ACAD), could be benefit. Trimetazidine can also improve coronary flow by increasing adenosine levels.

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administration of nitroglycerin and nitrate derivatives should be avoided because they can induce further coronary dilatation .(4)

Percutaneousmethods with (PTFE)-covered stents has gained popularity preventing their rupture .Some investigators suggested that the use of PTFE-covered stents should be limited to patients whose aneurysms are <10 mm in diameter and those with a fistula that needs closure. Other percutaneous options include coil embolization and autologous saphenous vein-covered stent grafting.(5) PTFE-covered stents due to their ability to effectively limit expansion of coronary aneurysms by reducing blood flow within the dilated segments .

In the present study, we reported a case of CAAs, which was managed by using a covered stent.

Case Presentation

A 54-year-old man with a history of hypertension, smoking, and ischemic heart disease presented to the Emergency Department 2 h after the sudden onset of a severe chest pain. He had also experienced exersional chest pain over the past two weeks. He reported to have been previously evaluated at a different institution for similar but less severe symptoms five years prior to this admission, where he had undergone coronary angiography, the results of which were unknown. Medical treatment with aspirin, losartan, simvastatin, and propranolol had been started and continued thereafter over the last five years, and he was symptom-free until the recent symptoms appeared in the past two weeks.

On physical examination, his blood pressure was 90/60mmhg, and heart rate was 100 beats/min. Chest and heart examinations revealed third heart sound and rales in the lungs (Killip class III). A 12-lead electrocardiogram showed sinus rhythm with ST elevations in leads V1-V6, I, and aVL, as well as ST depression in leads III and aVF (Figure 1). In addition, the patient was detected with raised cardiac enzymes (creatinine kinase myocardial bound/ creatinine kinase of 355/2360 and positive troponine I level). Echocardiography revealed the ejection fraction of 20%, akinesia of all apical segments, severe hypokinesia of anterior, anterolateral, anteroseptal, and inferoseptal wall in mid segments. The results of laboratory assessments included the normal levels of electrolyte, glucose, creatinine, and blood cell count.

Accordingly, 325 mg aspirin, 600 mg clopidogrel, and 5000 unit unfractionated heparin were prescribed, and the patient was scheduled for primary percutaneous coronary intervention in the setting of acute ST-elevation myocardial infarction. The patient was subjected to emergency coronary angiography, which revealed a large aneurysm in the proximal part of the left anterior descending (LAD) coronary artery, which occluded the left anterior descending artery (Figure 2). The left circumflex artery had significant stenosis at proximal segment, and it was cut off at distal part. Right coronary artery showed diffuse ectasia Figure 3 (A, B).

It was decided to perform a percutaneous coronary intervention with a covered stent. Engagement was implemented with a 6 left French Judkins guiding catheter. Wiring was performed using a BMW wire (Figure 4).

After wiring, pre-dilation was performed by means of a 1/5-15 mm Apex push balloon. Two boluses of intracoronary eptifibatide was injected and continued intravenously at 1 mg/kg/min for 24 hours. The placement of the graft-coated stent (3/5-26 mm, JOSTENT Graft Master) failed initially because crossing the stent was not possible. Therefore, predilation was accomplished using a 2/5-15 mm Sapphire balloon and a 3-12 mm NC Trek. The graft-coated stent (3/5-26 mm, JOSTENT Graft Master) was deployed on the proximal segment of LAD (Figure 5).

Post-dilation was performed by means of a 3/5-10 mm Sapphir balloon. The distal part of the





Figure 2. A.Left anterior oblique caudal view (picture above) and B. right anterior oblique caudal view (picture below) of the left coronary angiogram showing the aneurysm of the left anterior descending artery

JCTM





Figure 3. (A, B). Two image of Right coronary angiogram showing diffuse ectasia of the right coronary artery



Figure 4. wiring of the left anterior descending artery





Figure 5. Graft-coated stent deployed on the proximal segment of the left anterior descending artery



Figure 6. Coronary angiogram post-stent graft implantation showing the complete exclusion of the aneurysmal sac (dissection flap is seen at the mid part of the left anterior descending artery

LAD was dissected; therefore, the second stent (4-15 mm, Vision stent) was deployed on the distal part of the first stent (Figure 6). An intraaortic balloon pump (IABP) was inserted into the aorta for circulatory support.

The IABP was removed 48 hours later when the patient became hemodynamic ally stable. The patient was discharged 6 days later on dual antiplatelet therapy.

Discussion

The most common cause of CAAs is atherosclerosis, which accounts for 50% of CAAs diagnosed in adults (6). Most often, the clinical manifestations of CAAs are similar to those observed in coronary artery disease. A frequent finding is the presence of thrombi within the aneurysm. The slow flow of blood on the irregular internal surface of the aneurysm wall predisposes the formation of thrombi with subsequent embolization, resulting in angina pectoris, dyspnea, myocardial ischemia, infarction, and sudden death (7-10). Angina can also be related to the associated atherosclerosis or the sluggish flow caused by the aneurysm itself (11).

There is no consensus on the optimal management of CAAs, and the treatment options for CAAs consisting of surgical, percutaneous, and medical approaches. Since the natural history and prognosis are associated with multiple factors, the decisions around treatment should be tailored to each patient while considering many aspects, such as clinical presentation, etiology, aneurysm size, location, expansion by time, association with infections, and presence and extent of any coexisting atherosclerosis (12-16). In cases where percutaneous exclusion is decided upon, covered stents are recommended in those with suitable anatomy (17, 18).

However, there are still several concerns

around the use of covered stents, including a reduced deliverability, risk of restenosis and thrombosis, and occlusion of side branches (18). We successfully deployed covered stent at the proximal segment of LAD, which included large aneurysm and tight stenosis. The patient remained asymptomatic throughout the three years of follow-up. Therefore, covered stents may be an alternative to other treatment options in such cases.

Conclusion

Percutaneous approach to coronary aneurysms with the exclusion of aneurismal lumen by the placement of graft-coated stent is a feasible and safe procedure even during the acute phase of myocardial infarction. It may probably improve the patient's outcome by accelerating the treatment process in the setting of acute STelevation myocardial infarction in contrast to other treatment options.

Conflict of Interest

The authors declare no conflict of interest.

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