Large Atherosclerotic Left Main Coronary Aneurysm

A Case Report and Review of the Literature

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Coronary artery aneurysm (CAA) is a rare disorder, characterized by an abnormal dilatation of a localized portion of the coronary artery. It is usually diagnosed incidentally by coronary angiography. Over 50% of coronary artery aneurysms are of atherosclerotic origin. The natural history of coronary aneurysms is not well understood. Their presence is not always considered to be an operative indication; rather, the severity of the associated coronary artery disease (CAD) is what dictates a surgical approach. In the absence of obstructive CAD, the definitive treatment for this condition is unclear. The authors present the case of an isolated saccular left main coronary aneurysm with no associated flow-limiting CAD. The patient was treated medically with antiplatelet and anticoagulant medication with no adverse events at 3, 6, 9, and 12 months of follow-up.

Introduction

Coronary artery aneurysm (CAA) is an uncommon abnormality, diagnosed incidentally during coronary angiography or at necropsy. The prevalence varies from 0.5% to 4.9% in patients with coronary artery disease (CAD). The disease has a male predominance and a predilection for the right coronary artery.[1,2] Most of the isolated coronary aneurysms are atherosclerotic in origin and are considered a variant of CAD.[3] Atherosclerosis accounts for over 50% of coronary aneurysms in adults, followed by Kawasaki disease and congenital etiology.[4]

The left main coronary artery is the least frequently involved artery, with only a few case reports in the world literature.[5,6] The natural history remains unclear, and a consensus on the treatment of coronary aneurysm has not been established. Reported complications include thrombotic occlusion, thromboembolism, rupture, and vasospasm.[6] In patients with obstructive CAD and coronary aneurysm, myocardial revascularization is indicated.[7] In the absence of obstructive CAD, the definite treatment for this condition is unclear. We describe in this report a patient with a large left main CAA and its follow-up for up to 12 months.

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Case Report

A 79-year-old man with no significant past medical history presented with complaints of intermittent chest tightness and shortness of breath of 1-month duration. He was admitted with a diagnosis of unstable angina. Symptoms worsened 1 week prior to admission and were precipitated by minimal activity. His risk factor for CAD consisted of a positive family history of premature atherosclerosis. There was no history of trauma. Upon physical examination, he had a heart rate of 75 beats per minute and a blood pressure of 150/90 mm Hg. Lung fields were clear and heart sounds were normal without gallops, murmurs, or rubs. A resting ECG showed sinus rhythm, first degree AV block, and left ventricular enlargement without evidence of ischemia. Chest x-ray was normal. Laboratory data was unremarkable, and a myocardial infarction was ruled out by serial enzymatic measurements. After initial medical treatment with aspirin, heparin, and nitrates, the patient underwent cardiac catheterization.

The left ventricular function was normal with an ejection fraction of 55%. The coronary angiography demonstrated a large left main coronary artery aneurysm without flow-limiting CAD (Figure 1). A transesophageal echocardiogram confirmed a left main aneurysm of 1.1 × 1.1 cm in diameter without evidence of luminal thrombosis (Figure 2). After informed consent, the patient was managed conservatively with the antiplatelet agent aspirin and for anticoagulation with warfarin. The patient did well with no further cardiac symptoms after follow-up at 3, 6, 9, and 12 months.

Discussion

Coronary artery aneurysms are defined as dilatations of more than 1.5 times that of the diameter of the adjacent normal coronary segment.[7,8] Coronary aneurysm is an uncommon disorder diagnosed by coronary arteriography. Although aneurysmal dilatations have been described involving all of the major coronary vessels, the right coronary artery is the one most frequently affected. Left main coronary aneurysm is the least common and represents only 3.5% of the total reported cases.[4] Coronary aneurysms are more prevalent in men. There are several known causes of coronary aneurysms (Table I). The most common etiology is atherosclerosis, accounting

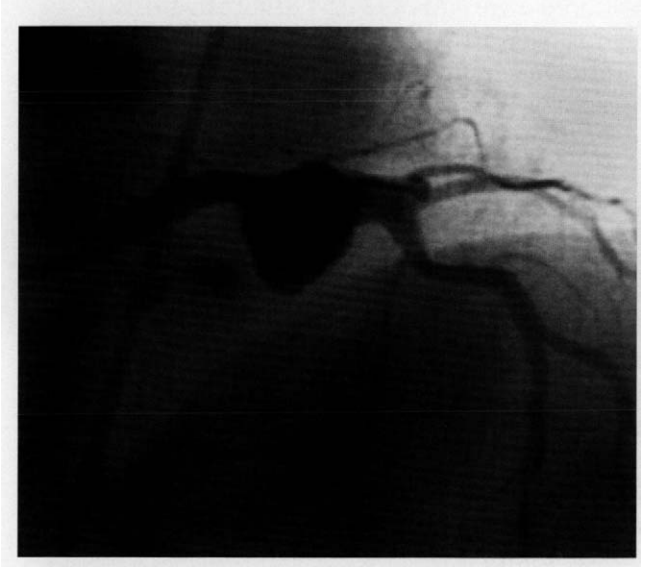

Figure 1. Left main coronary aneurysm as viewed in the right anterior oblique projection.

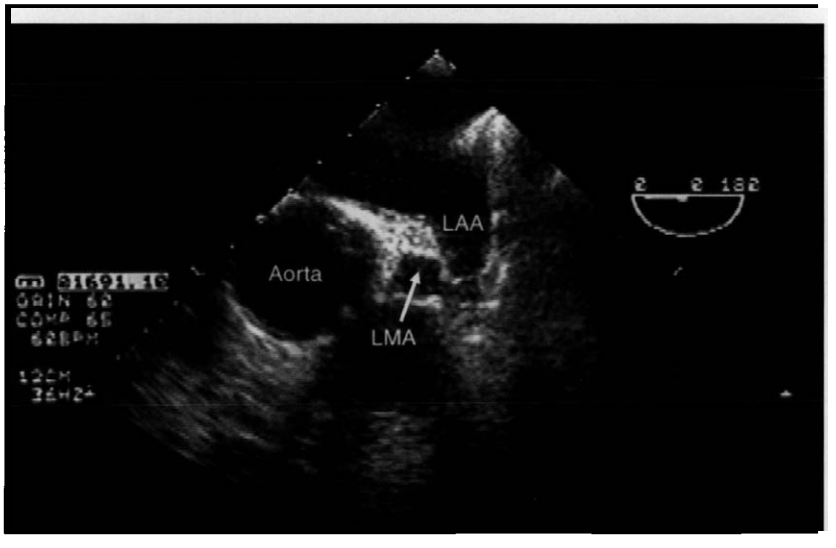

Figure 2. Basal short axis view by transesophageal echocardiography. Transverse view above aortic valve showing the large left main aneurysm. LAA = left atrial appendage, LMA = left main aneurysm.

Table I. Etiology of coronary artery aneurysms.

Atherosclerosis
Kawasaki disease
Congenital
Postpercutaneous coronary interventions
Trauma
Dissection
Mycotic
Arteritis (polyarteritis nodosa, syphilis, Takayasu's arteritis)
Connective tissue disorders (Ehlers-Danlos and Marfan's syndromes)

for more than 50% of coronary aneurysms in adults. An essential component in the formation of coronary aneurysms is an abnormal vessel media with erosion, ulceration, and hemorrhage due to an extension of the intimal atherosclerotic process. The aneurysms associated with coronary ectasia and Kawasaki disease are generally multiple and diffuse, whereas the atherosclerotic ones are discrete and focal.[8] Although several scoring systems have been developed previously to identify children with Kawasaki disease at highest risk for the formation of coronary aneurysm abnormalities, no similar scoring system exists for atherosclerotic coronary aneurysms.[9]

The natural history of coronary aneurysms is not well understood. Most of the coronary aneurysms remain asymptomatic and are incidentally diagnosed by coronary angiography done for the symptoms suggestive of myocardial ischemia, which is usually secondary to the coexisting flow-limiting lesions in coronary arteries or, rarely, thromboembolism from the aneurysm. Coronary arteriography is the gold standard in the diagnosis of aneurysms, providing information regarding the size, shape, location, and number. Transesophageal echocardiogram is a good tool to diagnose proximal right and left coronary aneurysms and to evaluate their association with surrounding tissues.[10] It is also a good modality to follow changes in the size of the aneurysm at regular intervals. At centers where expertise in transesophageal echocardiogram is not available, contrast enhanced CT scan may be useful to follow changes in aneurysm size. The main complications of coronary aneurysms include thrombosis, distal embolization, rupture, and vasospasm.[6] The exact prevalence of thrombus formation within the aneurysm is unknown, but case reports have quoted a prevalence of over 75%.[11,12] Coronary aneurysm rupture is rare and unpredictable. In the largest reported cohort of coronary aneurysms (CASS), no cases of aneurysmal rupture were documented.[13]

Very little is known about the treatment of left main coronary aneurysm, mainly due to their rarity and the lack of symptoms. The management of these patients depends on the presence or absence of the coexisting obstructive CAD rather than the sole presence of coronary ectasia or aneurysm.[14] Percutaneous treatment using stents coated with autologous saphenous veins or prosthetic grafts have been reported.[15] Surgical treatment may be necessary depending on the severity of associated coronary stenoses or other complications associated with the aneurysm that can not be safely treated with medical therapy or percutaneous management. Medical therapy consists mainly of antiplatelet therapy and anticoagulation.[16] The use of anticoagulation is based on observations of thrombus formation within the aneurysm and distal embolization, which lead to myocardial ischemia or infarction.

Since the patient in this report had an aneurysm in the left main coronary artery, treatment with a covered stent was not safely feasible. He was also not a candidate for surgical therapy due to the absence of flow-limiting coronary disease. He was therefore managed conservatively with aspirin and warfarin therapy.

Conclusion

We report a patient with a discrete spherical large left main coronary aneurysm and nonobstructive CAD detected by coronary angiography. In view of the lack of flow-limiting CAD and the location

of the aneurysm, a decision was made for conservative management with antiplatelet therapy and oral anticoagulation. The patient continues to do well at 3, 6, 9, and 12 months of outpatient follow-up. We therefore propose that initial conservative management and follow-up is a reasonable option in patients with coronary aneurysms without obstructive CAD. However, long-term follow-up and studies are required to define the natural course and the appropriate management of these patients. Since the incidence of left main coronary aneurysm is so rare, the only feasible way to know more about its natural history is to set up a multicenter registry.

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