Case Report

Emergent Operation for Aneurysm of the Left Main Coronary Artery Presenting Acute Myocardial Infarction

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We report an emergent operation on a 37-year-old man presenting with acute myocardial infarction with an aneurysm of the left main coronary artery. A preoperative coronary angiogram revealed a large saccular aneurysm of the left main coronary artery and complete occlusion of the left anterior descending artery. Emergent coronary artery bypass graftings to the left anterior descending artery with the left internal thoracic artery and the circumflex artery with the saphenous vein were performed, followed by the ligation and exclusion of the aneurysm of the left main coronary artery. The postoperative course was uncomplicated and the patient did well. Although the etiology of the aneurysm was not investigated, it was suspected to be a congenital aneurysm. (Ann Thorac Cardiovasc Surg 2004; 10: 195–7)

Key words: left main coronary artery, aneurysm, myocardial infarction, coronary artery bypass grafting, exclusion

Introduction

An aneurysm of the coronary artery is relatively uncommon, and that of the left main coronary artery especially is extremely rare. Although its prognosis is unknown, the patients with an aneurysm have a greater incidence of accident than without an aneurysm in several studies. We report a successful surgical case presenting acute myocardial infarction with aneurysm of the left main coronary artery.

Case Report

This was the first hospital admission for a 37-year-old man who had been in excellent health. He had sudden anterior chest pain during snow-removing work and was transported to the hospital in an ambulance. As he was diagnosed with an acute myocardial infarction from the findings of his electrocardiogram, a coronary artery angiogram was done immediately. The angiogram revealed a large saccular aneurysm of the left main coronary artery and total occlusion of the left anterior descending artery (Fig. 1). The other coronary arteries showed no abnormalities. Because his chest pain was increasing and persistent, an emergent operation was decided upon and he was transported to the Department of Cardiovascular Surgery.

A physical examination at arrival showed his blood pressure of 110/80 mmHg and a regular pulse of 66 per minute on continuous intravenous infusion of dopamine and nitroglycerin. His lung and heart did not show any abnormalities. All the data of blood chemistry was normal.

The patient immediately underwent coronary artery bypass graftings and ligation of the aneurysm on cardiopulmonary bypass. The bypass grafts was put on the left anterior descending artery with left internal thoracic artery and the left circumflex artery with saphenous vein graft. After that the ascending aorta was opened and the orifice of the left coronary artery was oversewn and closed with 3-0 polypropylene, and the distal portion of the left main coronary was ligated (Fig. 2).

The postoperative course was uncomplicated. One month later, a postoperative cardiac catheterization and a coronary angiogram were performed. The two bypass grafts were patent and functioning well, and the excluded

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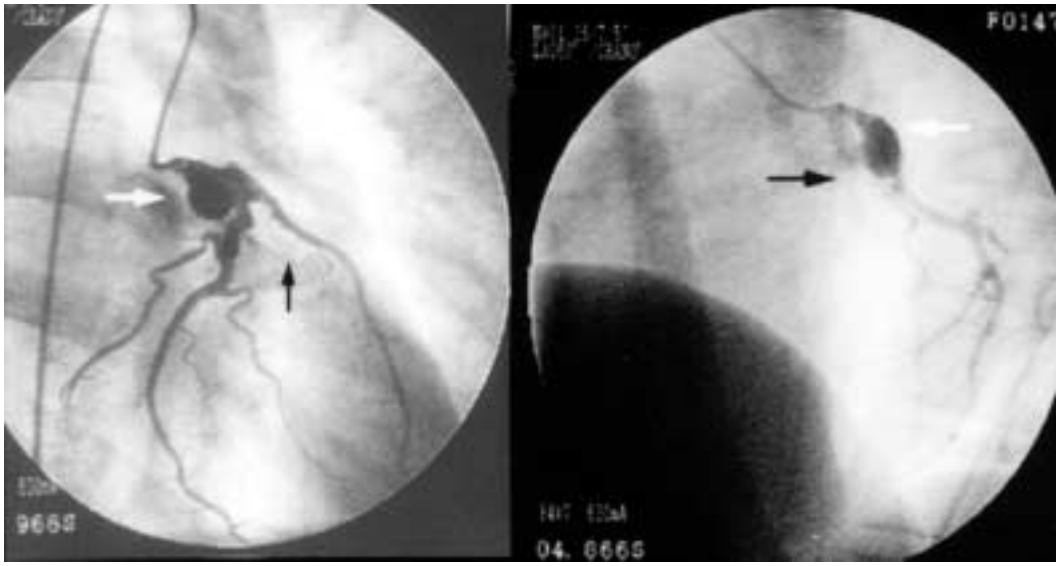

Fig. 1. Preoperative coronary angiogram revealed a large saccular aneurysm of the left main coronary artery (white arrow) and complete occlusion of the left anterior descending artery (black arrow).

aneurysm was not demonstrated (Fig. 3). Pressure examination data were within normal limits and cardiac function was good.

Discussion

An aneurysm of the coronary artery is relatively rare. Coronary artery aneurysms are more frequently found in the right coronary artery and in the circumflex artery than in the left anterior descending artery, whereas that of the left main coronary artery is extremely uncommon.[1)] In about 50 cases of left main coronary aneurysms reported on in the past, the etiology has included atherosclerosis, congenital, Kawasaki disease, SLE, Behcet disease, traumatic and unknown causes. Atherosclerosis is the most common cause in these reports. The pathology of this case was not elucidated, although it was suspected to be congenital because of the patient's age and history and the lack of either atherosclerotic or inflammatory findings.

Because left main coronary artery aneurysms are rare, no general agreement on their treatment has been achieved. The prognosis of patients with a coronary artery aneurysm is assumed to be related to the presence or absence of associated stenotic lesions rather than to the aneurysm itself.[2)] In this patient, this was the first attack of chest pain, resulting in acute myocardial infarction caused by left anterior descending artery obstruction. It was probably due to emboli from the aneurysm of the left main coronary artery. We performed emergent coronary artery bypass graftings to the left anterior descending artery and the circumflex artery, followed by the exclusion of the aneurysm. Although total arterial revascularization is more desirable in this case considering his young age, a saphenous vein graft was employed to the circumflex artery because of time limitation on this emergent situation.

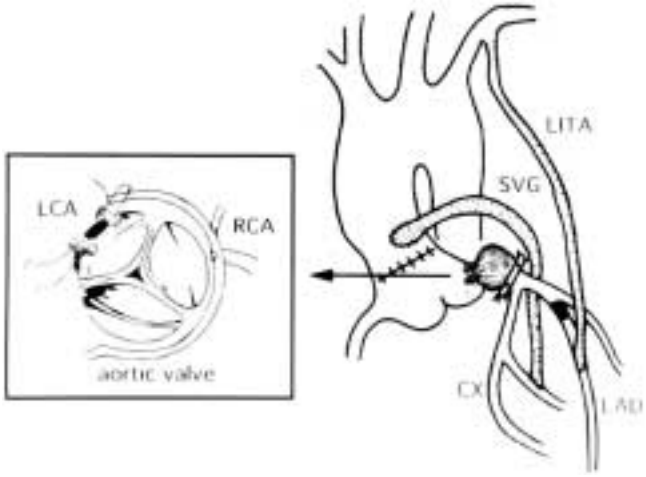

Fig. 2. Schematic illustration of operation. The left internal thoracic artery (LITA) was bypassed on the left anterior descending artery (LAD), the great saphenous vein graft (SVG) was placed on the circumflex artery (Cx). The aneurysm was excluded by oversewing the orifice of the left coronary artery (LCA) from inside of the ascending aorta and ligating the distal portion of the left main coronary artery. RCA: right coronary artery

Both conservative therapy with anticoagulants and surgical bypass are reported for the treatment of an aneurysm of the left main coronary artery. Medical treatment has been preferred for the aneurysms without stenotic

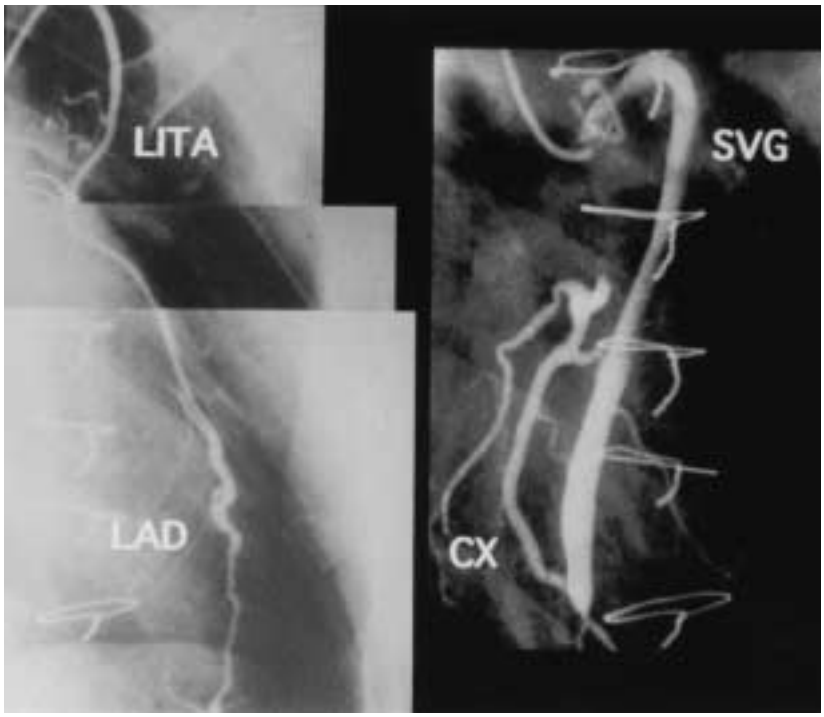

Fig. 3. Postoperative angiogram showed that two bypass grafts were patent and functioning well.

lesions, and surgical treatment has been recommended for aneurysms associated with stenotic vessels. However, Rath et al.[3] described five patients showing progression to acute myocardial infarction resulting from occlusion of a previously non-stenosed vessel. Thrombi or emboli from the aneurysm were suspected as the cause of occlusion. From these findings, surgical treatment is recommended for the aneurysm of the left main coronary artery. There is no description concerning the surgical method regarding the aneurysm location in the literature, and bypass grafts have been done in most of the cases. However, anuerysmorraphy or patch angioplasty may be considered for the aneurysm in which there are important branches included.

Although coronary artery bypass grafting without ligation or resection of aneurysms were described in several reports,[4,5] we consider that ligation and isolation or resection of an aneurysm are necessary to avoid rupture or embolization. In general, it is difficult to approach the left main coronary artery directly because it is located just behind the main pulmonary artery. Fukaya et al.[6] reported the ligation of the left main coronary artery aneurysm under a temporary transection of the main pulmonary artery, but we did not directly approach the aneurysm. Instead, the orifice of the left main coronary artery was oversewn from the inside of the ascending aorta. Lentini et al.[7] reported the same method for the large and calcified aneurysm. In our case, the aneurysm was excluded completely by adding the ligation of the distal portion of the left main coronary artery from outside. This is the preferred method in ligating and isolating the aneurysm, particularly in an inflammatory aneurysm firmly adhered to the surrounding tissue.

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