

Surgical treatment of giant saccular coronary artery aneurysm: a case report

Sakküler dev koroner arter anevrizmasında cerrahi tedavi: Olgu sunumu

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Aneurysm of coronary arteries is rare and diagnosis is usually made accidentally during coronary angiography. Atherosclerosis, Kawasaki disease, autoimmune diseases and syphilis are among common etiologic factors. Spontaneous rupture of the aneurysmal sac, thrombosis and distal emboli are the major causes for mortality and morbidity. Treatment options vary from surgical intervention to conservative drug therapy such as antithrombotic treatment, depending on the localization and the dimensions of the lesion and the clinical outcome of the patient. In this article, we report a patient who underwent operation for giant saccular coronary artery aneurysm in the left anterior descending artery.

Key words: Aneurysm; coronary artery; coronary bypass; interposition.

Coronary aneurysm is defined as the dilatation of a coronary artery of more than 150% at its largest cross-sectional area. It is seen in 0.15-4.9% of coronary artery catheterization studies.^[1,2] The most frequently affected vessel is the right coronary artery (RCA), but aneurysmal dilatation of the left anterior descending (LAD) artery is very rare. Etiologic factors differ according to age, such as Kawasaki disease in pediatric patients and atherosclerosis in adult populations. Other possible causes for this rare entity are connective tissue disorders, autoimmune diseases, trauma, syphilis, and iatrogenic dissection during angioplasty.

Treatment options differ according to the nature of the lesion and clinical status of the patient. Antithrombotic and antiaggregant drug therapies are mandatory since spontaneous occlusion due to thrombosis in the sac is fatal. The presence of a large lesion or thrombus formation in an aneurysm sac are indications for surgery. In this paper, we present the surgical treatment

Koroner arter anevrizması nadiren görülmekte ve tanı genellikle koroner anjiyografi sırasında tesadüfen konulmaktadır. Ateroskleroz, Kawasaki hastalığı, otoimmün hastalıklar ve sifiliz sık görülen etyolojik faktörler arasındadır. Anevrizma kesesinin spontan rüptürü, trombozu ve distal emboli mortalite ve morbiditenin başlıca nedenleridir. Tedavi seçenekleri lezyonun yeri ve boyutu ve hastanın klinik sonucuna göre cerrahi müdahaleden antitrombotik tedavi gibi konservatif ilaç tedavisine kadar farklılık göstermektedir. Bu yazıda sol ön inen arterde dev sakküler koroner arter anevrizması nedeni ile ameliyat edilen bir olgu sunuldu.

Anahtar sözcükler: Anevrizma; koroner arter; koroner baypas; interpozisyon.

of a patient who had a giant aneurysm starting from bifurcation of the left main coronary and extending to the LAD artery.

CASE REPORT

A 67-year-old male patient was admitted to our hospital with chest pain. A treadmill electrocardiogram (ECG) revealed ischemic findings, and the patient was taken to the cardiac catheterization laboratory for further investigation. A large aneurysm measuring 42x32 mm that extended from the left main coronary artery (LMCA) bifurcation to the proximal LAD artery was detected (Figure 1, 2). The circumflex artery was also originating from the aneurysm sac. Flow deceleration and multiple atherosclerotic lesions were reported in the coronary arteries distal to the sac. There were also insignificant lesions in the right coronary artery. Ejection fraction was measured as 45%, and the basal segment of the septum was shown to be hypokinetic by echocardiography.

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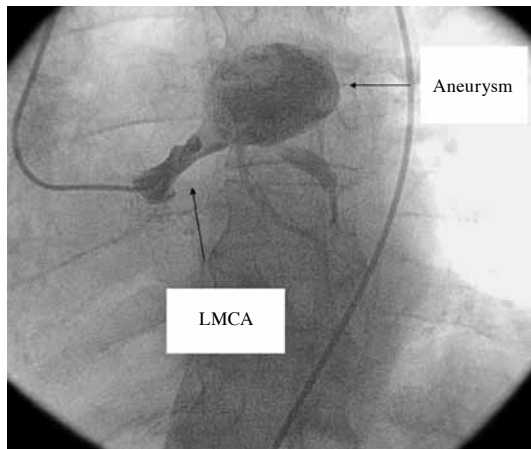


Figure 1. Angiographic view of the aneurysm. LMCA: Left middle cerebral artery.

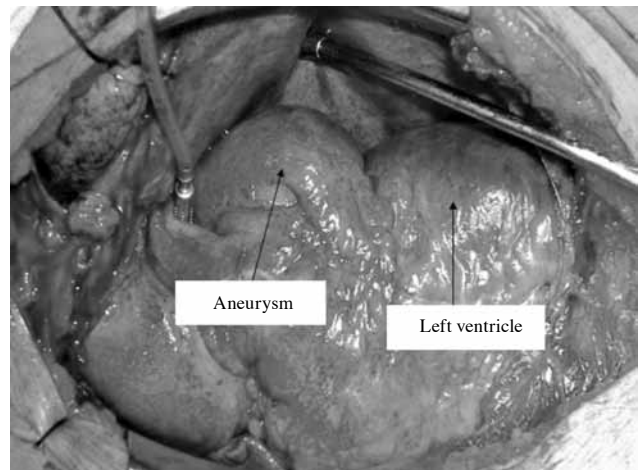


Figure 2. Intraoperative view of the aneurysm.

There were no significant findings in the patient's history except for a diagnosis of pulmonary tuberculosis 10 years previously. Other preoperative tests, such as blood biochemistry and a hemogram, were normal.

Surgical intervention was planned for the patient since there was a high risk for spontaneous rupture and thrombus formation because of decelerated flow distal to the aneurysm sac. The patient was taken to the operating theatre where cardiopulmonary bypass (CPB) was conducted, and the ascending aorta was clamped. After delivery of a cold, crystalloid, cardioplegic solution, the aneurysm sac was incised longitudinally, and the thrombus material was removed (Figure 3). Both coronary ostia in the aneurysm were visualized. The aneurysm sac was plicated primarily. Continuity between the LMCA and LAD artery was achieved with saphenous vein graft interposition (Figure 4, 5). The circumflex artery ostium was intact. Distal atherosclerotic

lesions of the LAD, the first diagonal branch, and the circumflex artery were bypassed with left internal mammary artery (LIMA) and saphenous vein grafts respectively (Figure 6, 7). The aortic cross clamp and total CPB times were 70 and 126 minutes. The postoperative course was uneventful. The pathology specimen was reported as diffuse atherosclerosis. The patient was anticoagulated with oral warfarin therapy and taken to the cardiac catheterization laboratory to visualize graft patency. All bypass grafts and interposed saphenous vein grafts were shown to be patent, and the patient was discharged on the eighth postoperative day.

DISCUSSION

Coronary artery aneurysm is defined as the enlargement of the vessel radius 1.5 times, whereas lesions larger than 4 cm are termed giant aneurysms. Among all coronary artery aneurysms, lesions of the left coronary

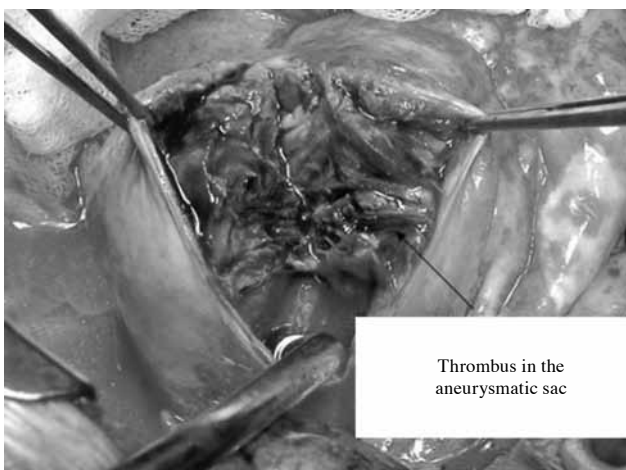


Figure 3. Thrombosis formation in the aneurysm.

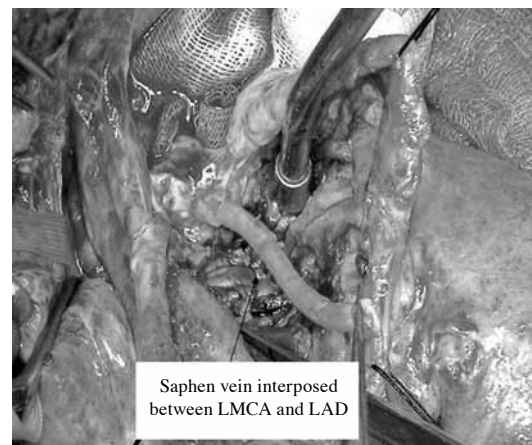


Figure 4. View of the saphenous vein. LMCA: Left middle cerebral artery; LAD: Left anterior descending.

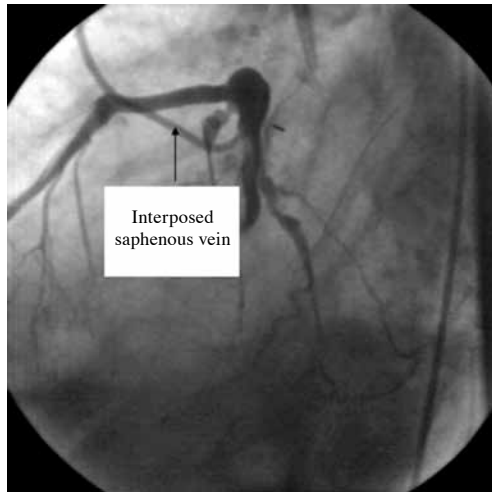


Figure 5. Angiographic view of the interposed saphenous vein.

artery are seen 20% of the time. Atherosclerosis is the major etiologic factor in the adult population,^[3] and it has been postulated by many authors that this rare entity is a variant of coronary artery disease.^[4] Our patient had similar findings regarding the presence of diffuse atherosclerotic lesions distal to the aneurysm sac.

These patients usually have a good prognosis, although there is a risk for thromboembolic events in spite of adequate anticoagulant therapy. Spontaneous rupture is seen more often with Kawasaki disease and with lesions secondary to arteriovenous fistulas.^[5] The primary treatment consists of a conservative approach with anticoagulant drug therapy. Nevertheless, giant lesions, such as the one we described, should be treated surgically.^[6] Also, the presence of atherosclerotic coronary artery disease along with the aneurysm makes surgical intervention mandatory for such

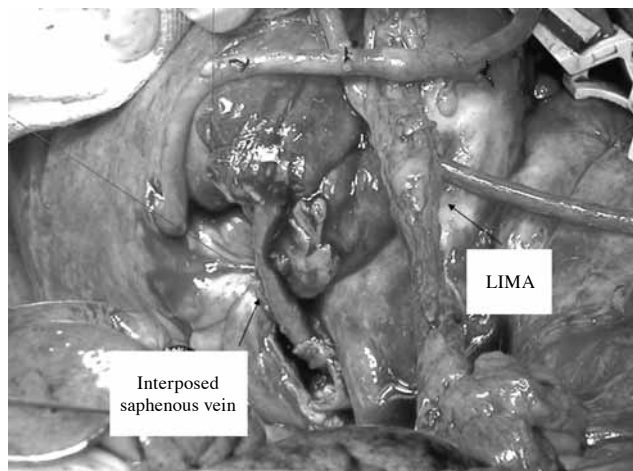


Figure 7. Intraoperative view of grafts. LIMA: Left internal mammary artery.

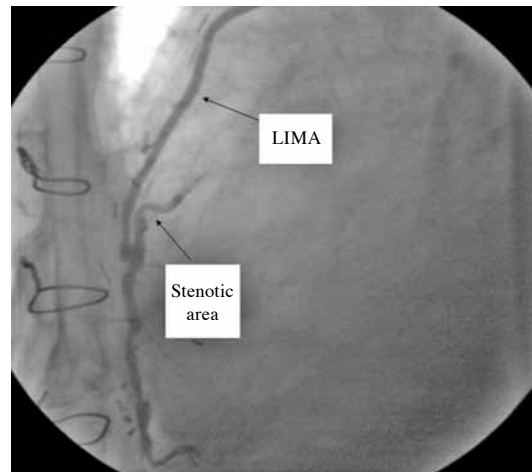


Figure 6. Postoperative view of LAD-LIMA anastomosis and stenosis at LAD. LIMA: Left internal mammary artery; LAD: Left anterior descending.

patients.^[7] The same situation existed for our patient since he had atherosclerotic lesions distal to the giant aneurysm sac.

Surgical treatment options include patch plasty, distal and proximal aneurysm sac ligation, and graft interposition as well as additional bypass grafting to the accompanying distal atherosclerotic lesions.^[3] In our case, patch plasty was not preferred because we saw diffuse atherosclerosis when we opened the aneurysm sac. Continuity of flow to the circumflex artery was maintained after plicating the sac. Due to the localization of the aneurysm, interposition of a saphenous vein graft was necessary between the LMCA and LAD. We also had to bypass the atherosclerotic lesions in the distal LAD, circumflex, and diagonal branch arteries.

Lin et al.^[3] presented their case in which the pulmonary artery was transected in order to totally excise the LMCA aneurysm. This was not needed in our case since the aneurysm sac was located further along the course of the LAD artery and could be reached easily. The absence of back flow from the distal LAD and the previously documented atherosclerotic lesions forced us to do multiple bypasses.

Coronary artery aneurysm is a rare but potentially fatal form of coronary artery disease, and the treatment approach differs according to the nature of the lesion. It should be treated surgically when there is a substantial risk for rupture or thromboembolic occlusion.

Declaration of conflicting interests

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