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Case Report
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Giant Left Coronary Artery Aneurysms and Concomitant Coronary Disease

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Abstract

Giant left main coronary artery aneurysms are rare conditions whose treatment is controversial. The possible complications are their rupture, thrombus formation and coronary dissection. We present a case of giant aneurysm associated to coronary artery disease in a young lady that was surgically treated with coronary artery bypass grafting and concomitant coronary aneurysms exclusion. The CT-scan at 6 months revealed patent grafts and complete exclusion of the aneurysm formation.

Introduction

Coronary artery aneurysms are rare dilatations of coronary arteries with increased diameter of more than 1.5 time the adjacent segments. Giant coronary aneurysms are defined as dilatations of more than 2 cm to 5 cm diameter [1]. Prevalence ranges from 0.4% to 4.9% of patients undergoing coronary angiography and the majority have an atherosclerotic origin [2]. They occur most often in the right coronary artery and the left main coronary trunk is rarely involved. Rupture is very rare but thrombus formation may be the source of distal coronary embolization. Although there is no consensus on standard treatment because of the lack of knowledge about the natural history, it sounds reasonable to provide aneurysm exclusion and surgical myocardial revascularization in presence of giant aneurysms and concomitant severe coronary artery disease.

Description

A 49-year-old lady suffering from angina (CCS 2) for the last five years underwent a stress test showing ischemic lesions in the inferior chest EKG leads. Patient's past history was characterized by a hypercholesterolemia, a previous menometrorrhagia on a fibrous uterus status and a hypochromic microcytic anemia. The subsequent evaluation by a Computed Tomography Scan (CT-Scan) showed a three-vessel coronary artery disease with giant aneurysms of left main trunk of about 3 cm diameter (Figure 1A), anterior descending coronary and circumflex coronary artery. A coronary angiogram confirmed the diagnosis of right and distal circumflex coronary artery occlusion with concomitant aneurysms of the left main, anterior descending and circumflex coronary artery (Figure 1B, 1C). Two-dimensional echocardiography showed preserved ejection fraction with mild hypokinesia of the left ventricular inferior wall. A cardiac magnetic resonance showed deficit of perfusion in the inferior and septal wall.

An interventional treatment was not considered because of the big dimensions of the aneurysm and the multi vessel disease.

The patient was then scheduled for surgical myocardial revascularization and coronary aneurysms exclusion. Through a median sternotomy, cardiopulmonary bypass was instituted in the standard way. After aortic cross-clamping and cardioplegic arrest, five coronary artery bypass grafts were performed: the Right Internal Mammary Artery (RIMA) was anastomosed to the first obtuse marginal branch; the Left Internal Mammary Artery (LIMA) was anastomosed, sequentially, to the first diagonal branch and to the left anterior descending coronary artery; a vein graft (Vein 1) was anastomosed to the right coronary artery and a second vein graft (Vein 2) to the second obtuse marginal branch (Figure 1D). Every left coronary artery was ligated proximally to the graft anastomosis and, through a small aortotomy, the left coronary ostium was excluded with a bovine pericardial patch. Weaning from cardiopulmonary bypass was uneventful and the flows in the bypass grafts were measured with transit-time flow meter probes (LIMA flow: 41ml/min, RIMA flow: 89ml/min, Vein 1 flow: 50ml/min, Vein 2 flow: 55 ml/min). Cross-clamp time, cardiopulmonary bypass time and total surgical time were 146 min, 190 min, and 375 min, respectively. The postoperative recovery was uneventful and the patient was discharged home on postoperative day seven. Six

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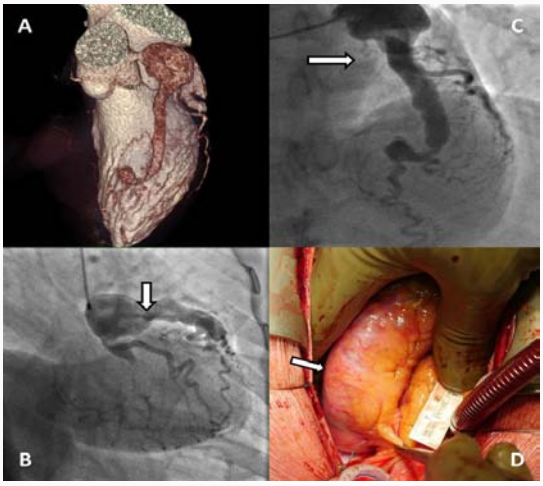

Figure 1: CT scan (A) and coronary angiography (B-cranial view; C-left anterior oblique view) showing giant aneurysm of the left main, anterior descending and proximal circumflex coronary arteries (arrows); intra-operative view (D) of the left main aneurysm (arrow).

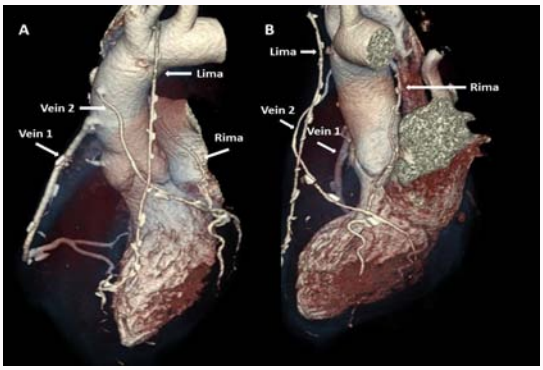

Figure 2: Three-dimensional CT scan reconstruction at six-month follow-up showing patent grafts and complete aneurysm exclusion. A) Anterior view. B) Left-lateral view.

months later the patient was asymptomatic and she underwent a cardiac CT-scan showing complete exclusion of the aneurysms and patency of the coronary artery bypass grafts (Figure 2).

Comment

Coronary artery aneurysms are very rare anatomical findings mostly due to the atherosclerotic disease. They can also be associated to Kawasaki disease, connective tissue disorders such as Elhers-Danlos or Marfan syndrome, infection or trauma, various types of arteritis such as systemic lupus erythematosus or Takayasu disease, or cocaine abuse [3]. In the presented case, the atherosclerotic disease, despite being rare in young women, seems to be the main cause as other diseases were excluded during the clinical workup.

The main risks related to the presence of giant coronary aneurysms are distal embolization due to the sluggish flow and clot formation within the vessel lumen, the wall rupture or the spontaneous coronary dissection due to progressive expansion. In case of isolated coronary aneurysms without concomitant coronary disease there is no consensus regarding the appropriate treatment and sometimes medical therapy can be a reasonable option [4]. However, in case of concomitant coronary disease surgical treatment seems to be a valid option, as it happened in the present clinical case. The decision to distally ligate and proximally exclude the aneurysms was made in order to eliminate the risk of rupture and to avoid the risk of distal coronary embolization.

Nevertheless, surgical closure of the left coronary ostium with a concomitant occluded right coronary ostium conditioned coronary flows fully dependent from the five bypass grafts. Hopefully, the complete revascularization warranted a good run-off on every coronary artery confirmed by the graft flows. Short term patency of all grafts and complete exclusion of all coronary aneurysms was confirmed by a CT-scan. Long-term prognosis will largely depend from graft patency.

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