

Asymptomatic Left Ventricular Pseudo-Aneurysm after Silent Myocardial Infarction

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Abstract

Left ventricular pseudo-aneurysm (LVP) is a rare and severe mechanical complication of myocardial infarction. However, more than 10% of patients appear asymptomatic at the time of diagnosis [1]. Because of the high risk of spontaneous rupture, early recognition and diagnosis is vital to allow a prompt surgical intervention, which represents the main therapeutic strategy for this condition. We reported a case of giant LVP for its unusual presentation in an asymptomatic patient, after silent myocardial infarction with complex and diffuse coronary artery disease, who underwent successfully to surgical repair with early recovery and discharge.

Keywords: *Left Ventricular Pseudoaneurysm; Myocardial Infarction; Surgical Repair; Mechanical Complications; Ventricular Rupture; Congestive Heart Failure*

Abbreviations

LVP: Left Ventricular Pseudo-Aneurysm; TTE: Transthoracic Echocardiography; CTO: Chronic Total Occlusion; LAD: Left Anterior Descending Artery; CABG: Coronary Artery Bypass Grafting; LIMA: Left Internal Mammary Artery; CT: Computed Tomography

Introduction

Left ventricular pseudo-aneurysm (LVP) is a rare and severe mechanical complication of myocardial infarction. However, more than 10% of patients appear asymptomatic at the time of diagnosis [1]. Because of the high risk of spontaneous rupture, early recognition and diagnosis is vital to allow a prompt surgical intervention, which represents the main therapeutic strategy for this condition.

Case Presentation

We describe a case of a 61-year-old man with a known history of hypertension, dyslipidemia and atrial fibrillation, who presented at medical attention in another hospital after detection of Q waves in the inferior leads at routine ECG before cataract surgery. Additional two-dimensional transthoracic echocardiography (TTE) was performed, which showed enlarged left ventricle (LV), with aneurysmatic evolution involving the inferior wall and a LV ejection fraction (EF) of 45%. The chest X-ray done during the preoperative examination, showed a cardiac silhouette wider than normal, with no pulmonary parenchymal consolidation or pleural effusion. Given the total lack of symptoms, the patient was discharged from the hospital in optimal medical therapy (including anticoagulation), with indication to perform soon thereafter a coronary angiography and a new TTE. The coronary angiography disclosed diffuse three-vessel disease, including two chronic total occlusion (CTO) of proximal right coronary artery and mid-circumflex coronary artery (Cx) and a focal severe stenosis of mid- left anterior descending artery (LAD). The repeated TTE confirmed the severe dilation of the LV, with mild EF reduction (45%);

however, this examination was suggestive of self-contained perforation of the LV inferior wall, consistent with the incidental finding of a large pseudoaneurysm of the left ventricle. The patient was then further investigated with a CT-scan, which confirmed the diagnosis of a large LVP (9.5 x 9.3 x 4.2 cm) adjacent to the diaphragmatic face of the LV (LVP neck of 4,7 x 4,8 cm) (Figure 1A-1D). Once the diagnosis was established the patient was referred to our center for surgical intervention. Even if the presentation suggested for a chronic coronary disease with depressed EF, we decided to not proceed with any viability study, because of the high risk of rupture of the LV pseudoaneurysm (considering the dimensions), but rather treat it like an urgent case. Surgical procedure consisted in resection of LVP, closure of the ventricular wall defect with a patch of Dacron (3 x 6 cm), coronary artery bypass grafting (CABG) with left internal mammary artery (LIMA) to the left anterior descending artery (LAD) and saphenous vein graft to the obtuse marginal artery. Occlusion of left atrial appendage was achieved using AtriClip® device. In this case considering benefit/risk ratio and the unpredictable results of myocardial revascularization, we preferred to use the saphenous vein graft for the marginal branch (instead of right mammary artery) also because of the patient's weight (BMI >28 kg/m²), in order to minimize the risk of sternal dehiscence. The procedure was performed after intra-aortic balloon pump (IABP) placement due to the onset of hemodynamic instability and with the accomplish of cardiopulmonary bypass. We did not collect any surgical pieces for histological examination. The subsequent postoperative course was uneventful without episodes of angina or ECG changes; myocardial enzyme levels did not increase. The patient was discharged to a rehabilitation facility on the 7th postoperative day, at which time echocardiographic exam showed no signs of pericardial effusion and LV ejection fraction of 45% with akinesia of the left ventricle inferior wall, compatible with the surgical procedure performed. Mild left ventricular diastolic dysfunction was also described (filling pressures at the upper limits, E/E¹ 10, indexed left atrial volume 37 ml/mq - transmitral-inflow pattern not significant because of the atrial fibrillation). These findings can be referred to an impaired relaxation of left ventricle, particularly of the LV inferior wall, where the patch was located.

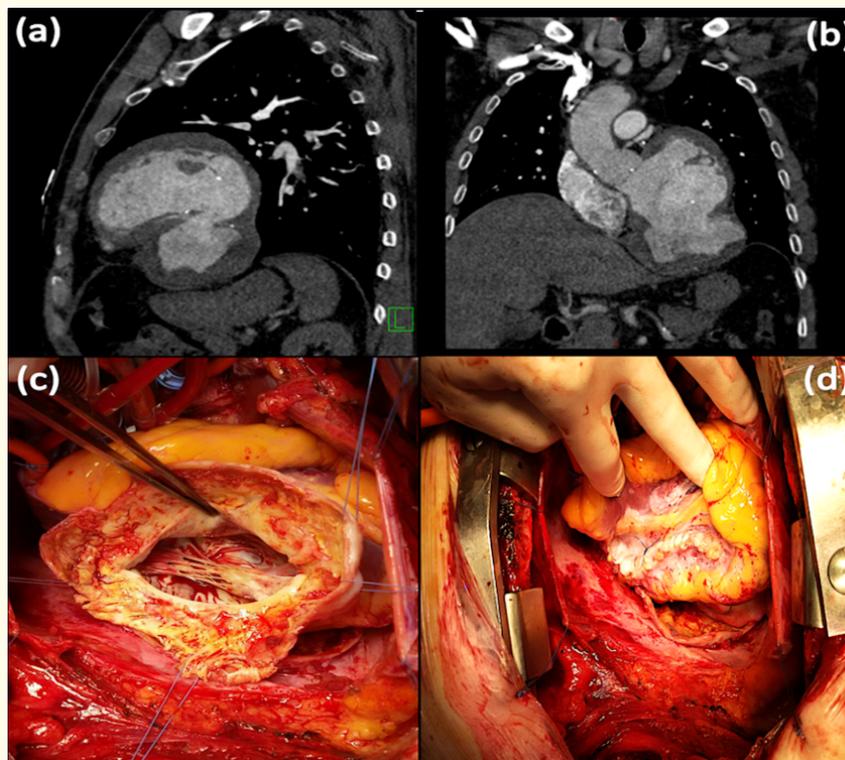


Figure 1: Multi-planar reconstructed computed tomography (A and B) showed a giant pseudoaneurysm of left ventricle (9.5 x 9.3 x 4.2cm). Intraoperative image showed an opened pseudoaneurysm sac (C) and the closure of wall defect using Dacron patch, covered with a single layer of 3/0 Prolene sutures using a piece of aneurysmal wall (D).

Discussion and Conclusion

The incidence of Left ventricular pseudoaneurysm (LVP) is relatively low and most cases are related to myocardial infarction. Other minor causes include mitral valve surgery, bacterial endocarditis, and previous chest trauma [1]. Pseudoaneurysm is the result of ventricular rupture contained by adherent pericardium and scar tissue, with no myocardial elements [2]. Pseudoaneurysm have been reported to originate usually at the posterior basal segment of the LV, lateral wall, apex and inferior wall of LV just like seen in this case. Usually clinical manifestations are always nonspecific, including congestive heart failure, chest pain or dyspnea, and arrhythmias. More than 10% of patients can even be asymptomatic at the time of diagnosis [1]. 2D-TTE is useful non-invasive methods for revealing the presence of left ventricular Pseudoaneurysm. Although LV angiography remains the best test, CT provides improved diagnosis and characterization of pseudoaneurysms, particularly in patients with equivocal echocardiographic findings, such as that observed in this patient. Repair of acquired pseudoaneurysms, of the left ventricle combined with appropriate myocardial revascularization can be performed with acceptable mortality and good long term results [3]. Due to the serious implications of this uncommon lesion, often challenging to diagnose, advanced imaging is very useful to guide the best surgical strategy.

Conflict of Interest

The authors declare no conflict of interest.

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