

Large Inferolateral Left Ventricular Aneurysm

Abstract

The majority of cardiac left ventricular aneurysms involve the anterior and/or apical wall. We present a case of a 50-year-old man with heart failure caused by a large inferolateral left ventricular aneurysm and associated mitral regurgitation, managed by aneurysmectomy, mitral valvuloplasty, and surgical revascularization.

Keywords: Cardiac surgery, heart aneurysm, left ventricular aneurysm, myocardial infarction

Introduction

Left ventricular aneurysms, typically composed of a thin, fibrotic, or scarred akinetic or dyskinetic wall, are most commonly a late consequence of transmural myocardial infarction.^[1-7] Whereas the vast majority involve the anterior wall and/or apex, any region may be engaged. Feared complications include heart failure, ventricular arrhythmias, systemic embolization from intracavitary thrombus formation, and rarely ventricular wall rupture. We report a case with a large inferolateral left ventricular aneurysm and associated mitral regurgitation managed by aneurysmectomy, mitral valvuloplasty, and surgical revascularization.

Case Report

A 50-year-old man with a history of hypertension and type 2 diabetes mellitus was referred to a regional hospital with complaints of exertional dyspnea and fatigue since several weeks. Electrocardiogram and clinical examination revealed new-onset atrial fibrillation and signs of heart failure. Computed tomography identified a localized 8 cm × 4 cm × 6 cm thin-walled inferolateral left ventricular aneurysm. Magnetic resonance imaging [Figure 1] detected essentially preserved contractility of the non-aneurysmal myocardium and intact papillary muscles [Video 1]. Echocardiography demonstrated global systolic and diastolic dysfunction (left ventricular ejection fraction [LVEF], 0.3–0.4) and moderate mitral regurgitation

due to restricted posterior leaflet motion. Coronary angiography revealed right dominance with posterolateral artery occlusion [Figure 2] as well as significant proximal/mid-left anterior descending artery (LAD) stenoses distal to a large septal branch. Pharmacologic treatment was commenced. The patient was accepted for surgery due to the size of the aneurysm and persistence of symptoms.

The patient was transferred to our department where he underwent median sternotomy and cardiopulmonary bypass. Perioperative transesophageal echocardiography visualized the bulging aneurysm [Video 2], which was incised, cleansed from thrombi, and partly resected [Figures 3 and 4]. The mitral valve was repaired through the ventriculotomy with an edge-to-edge Alfieri stitch, and the ventricular wall defect was closed with an internal pericardial patch and direct sutures. The left internal mammary artery was then anastomosed to the LAD. The postoperative course was uneventful apart from a few self-terminating episodes of atrial fibrillation. He was doing well and had returned to work at four-months' follow-up. Echocardiographic evaluation demonstrated a restored left ventricle with only mild systolic dysfunction (LVEF, 0.45–0.5) and some regional wall motion abnormalities, and mild residual mitral regurgitation.

Discussion

The incidence of left ventricular aneurysms following myocardial infarction mainly depends on the prevalence and acute

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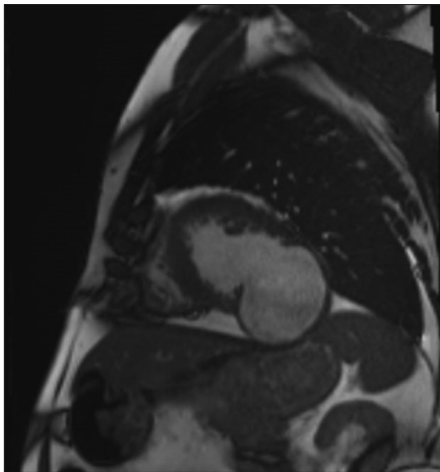


Figure 1: Cardiac magnetic resonance imaging short-axis view showing a thin-walled inferolateral left ventricular aneurysm with paradoxical bulging during systole



Figure 2: Right coronary angiogram showing posterolateral artery occlusion (arrow)

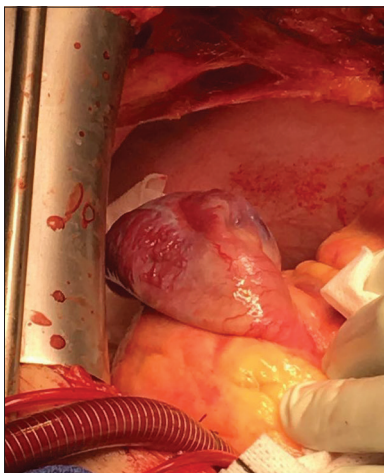


Figure 3: Intraoperative photograph of the inferolateral left ventricular aneurysm after sternotomy

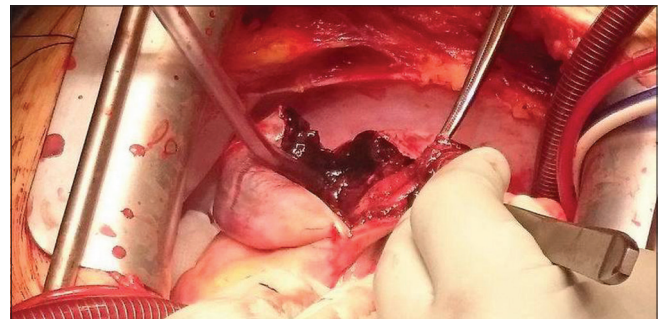


Figure 4: Intraoperative photograph after incision of the aneurysm

management of the latter.^[7] Incompletely revascularized patients with poor collateralization, such as the case we present, are at increased risk. Improved reperfusion techniques have significantly reduced this complication;^[8] at Uppsala University Hospital only a couple of cases are operated annually.

Approximately 80% of left ventricular aneurysms are located in the anterior and/or apical walls, most commonly associated with LAD occlusion.^[1,2,7] Only 10%–15% involve the inferior wall, while lateral aneurysms appear to be remarkably rare. Angiographic evidence of posterolateral artery occlusion seems to explain the less common localization in our patient.

Although aneurysm development may be asymptomatic, heart failure is rather common.^[7] Absence of contractile function of the bulging segment decreases the effective cardiac output and poses an excess volume load on the left ventricle, leading to dilation, increased wall stress, and subsequently failure. Concomitant coronary

artery disease yielding myocardial ischemia as well as distortion of left ventricular geometry resulting in mitral regurgitation may further contribute to this vicious process.

Medical treatment focused on afterload reduction, antianginal therapy, and anticoagulation in cases demonstrating substantial left ventricular dysfunction or thrombus formation is generally advocated for small to moderate size asymptomatic left ventricular aneurysms. Patients with larger yet asymptomatic aneurysms could probably be managed with the same conservative approach and followed closely. However, once progressive ventricular dilation and/or reduced global systolic function is detected, surgery should be considered.

Indications for surgery otherwise include clinical manifestations such as refractory, life-threatening tachyarrhythmias, systemic embolization despite appropriate anticoagulation therapy, and heart failure with or without angina.^[9] Coronary artery bypass grafting is frequently performed in conjunction with aneurysmectomy. When mitral valve repair is necessary due to severe regurgitation, it may be performed through the ventricular incision.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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