



# Surgical Repair of Post-Infarct True Posterobasal Ventricular Aneurysm with Mitral Valve Replacement and Coronary Revascularization: a Case Report

Dasarathan Charumathi, BS, Prashant Vaijyanath, MS MCH\*, Dr Kothurathu Mammen Cherian, FRACS, DSc

*Frontier-lifeline, Dr. K. M. Cherian Heart Foundation, Chennai, India.*

Received 05 May 2011; Accepted 25 September 2011

## Abstract

*Post-infarction ventricular aneurysm is a complication of myocardial infarction. While the involvement of the anterior wall is quite common, posterobasal left ventricular aneurysm is a rare clinical complication in this setting. In this case report, we report a post-infarction posterobasal left ventricular aneurysm combined with ischemic mitral regurgitation due to coronary artery disease, for which we successfully performed triple coronary artery bypass and ventricular geometry restitution via a modified Dor's procedure with mitral valve replacement through an extracardiac approach.<sup>1</sup>*

*J Teh Univ Heart Ctr 2012;7(1):37-39*

**This paper should be cited as:** Charumathi D, Vaijyanath P, Cherian KM. Surgical Repair of Post-Infarct True Posterobasal Ventricular Aneurysm with Mitral Valve Replacement and Coronary Revascularization: a Case Report. *J Teh Univ Heart Ctr 2012;7(1):37-39.*

**Keywords:** Heart • Mitral valve • Myocardial revascularization • Surgical procedures, Operative • Infarction

## Introduction

Post-infarction ventricular aneurysms are documented complications of myocardial infarction. Involvement of the anterior wall is quite common, whereas posterobasal left ventricular (LV) aneurysm is an infrequent clinical entity varying from 0 - 17%. Additionally, mitral incompetence may complicate the clinical pattern.<sup>1</sup> We report a case of successful surgical resection of a calcified giant LV saccular true posterobasal aneurysm with associated mitral incompetence through an extracardiac approach.

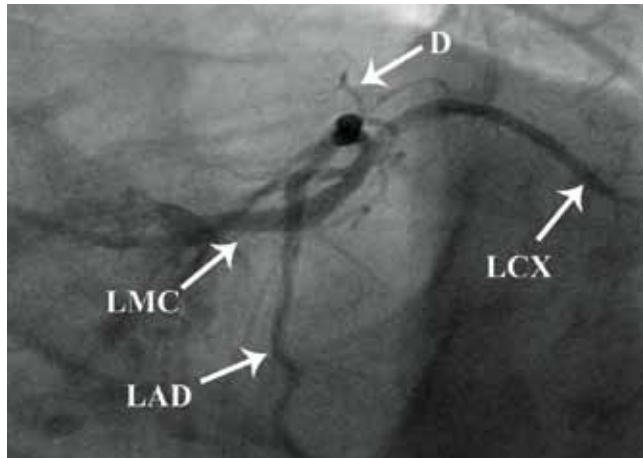
## Case Report

A 60-year-old diabetic man, a known case of coronary

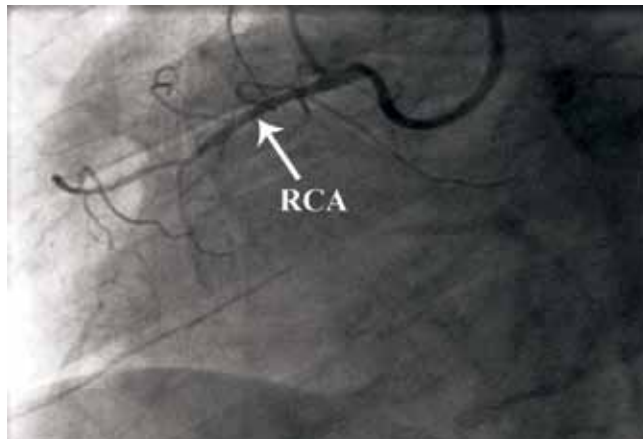
artery disease, presented with progressive dyspnea on exertion, New York Heart Association (NYHA) III of 4 years' duration. Physical examination revealed signs of severe mitral regurgitation. Transthoracic and transesophageal echocardiographic examinations confirmed the presence of severe eccentric mitral regurgitation (MR), dilated left atrium (LA) measuring 46 mm and LV measuring 78 mm with a large posterobasal aneurysm (8 × 7 cm), and severe LV dysfunction (ejection fraction [EF] = 31%). Coronary angiogram revealed severe triple vessel disease (Figure 1) and a large calcified posterobasal LV aneurysm. Cardiac Magnetic Resonance Imaging (MRI) confirmed the anatomic findings of the posterobasal location (Figure 2). Positron Emission Tomography (PET) showed absence of viable myocardium in the left circumflex territory (LCX) and hibernating viable myocardium in the left anterior

\*Corresponding Author: Prashant Vaijyanath, Senior Consultant Cardiothoracic Surgeon, Frontier Lifeline & Dr. K M Cherian Heart Foundation, R 30 C Ambattur Industrial Estate Road, Chennai 600 101, India. Tel: +91 44 42017575. Fax: +91 44 256 5150. E-mail: pvaijyanath@hotmail.com.

descending artery (LAD) and right coronary artery (RCA) territory (Figure 3). Coronary artery bypass grafting (CABG), in conjunction with LV aneurysm repair and mitral valve replacement, was contemplated.



A



B

Figure 1. A) Left coronary angiogram in left anterior oblique (LAO) caudal view showing LAD-D bifurcation lesion and LCX 100% total cut-off (arrows). B) posteroanterior cranial view showing blocked RCA (arrow) LMC, Left main coronary artery; LAD, Left anterior descending artery; LCX, Left circumflex artery; D, Diagonal artery; RCA, Right coronary artery

The operation was performed through a median sternotomy. Cardiopulmonary bypass with moderate systemic hypothermia was established between the ascending aorta and the superior and inferior vena cava through bicaval cannulation for venous return. Left heart was vented through the right superior pulmonary vein, and cardiac arrest was induced with cold crystalloid cardioplegia. Triple coronary artery bypass was carried out using reversed saphenous vein grafts (RSVG) to the LAD, diagonal, and RCA. The left internal mammary artery (LIMA) was not used because pre-op LIMA angiography revealed an unsuitable conduit and a very small atretic mammary. The aneurysm was dissected and exposed from the surrounding perietes before

it was opened and the whole mural thrombus (Figure 4) was evacuated. Inspection of the mitral valve revealed fibrosis of the posterior papillary muscle with severe tethering of the valve. The mitral valve was excised and replaced through the ventricle with a # 29 Carpentier Edwards porcine bioprosthesis (Edwards Lifesciences, CA, USA) by interrupted pledgetted mattress 2.0 Ethibond sutures on the atrial side (Ethicon, Johnson & Johnson, Ltd.) (Figure 5). The neck of the aneurysm was identified, and geometric restoration of the LV was performed with an oval bovine pericardial patch sutured with 3.0 Prolene (Ethicon, Johnson & Johnson, Ltd.) in a continuous fashion.

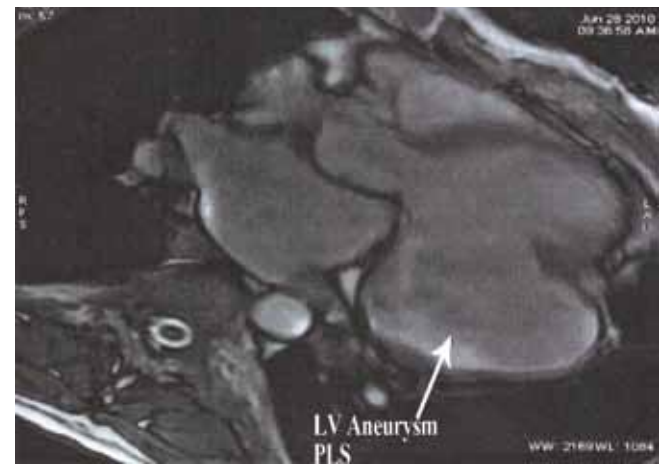


Figure 2. MRI showing the posterobasal left ventricular aneurysm (arrows)

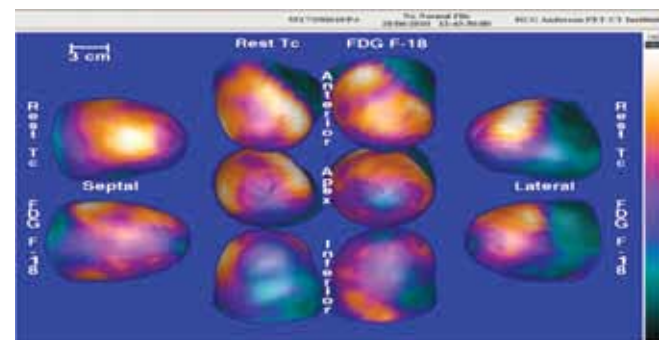


Figure 3. A picture of PET scan showing viability of myocardium

The excess of the aneurismal wall was excised leaving a 1-cm margin on either side, and the ventriculotomy was repaired in a linear fashion buttressed with Teflon strips on either side utilizing interrupted mattress 3.0 Prolene (Ethicon, Johnson & Johnson, Ltd.) (Figure 6). The cardiopulmonary bypass was discontinued.

The patient made an uneventful recovery and his subsequent postoperative course was unremarkable; he was, therefore, discharged on the 7<sup>th</sup> postoperative day.

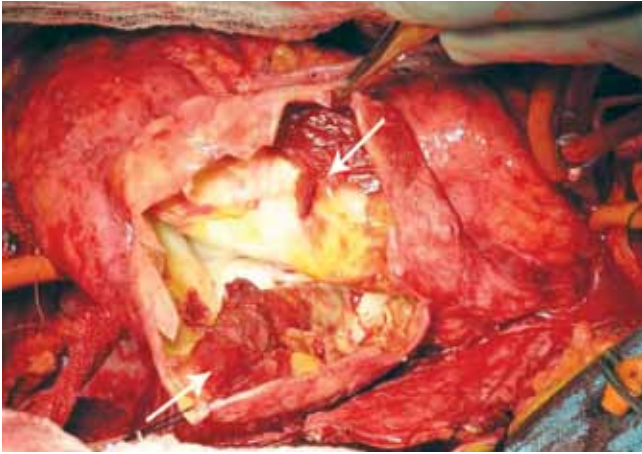


Figure 4. Aneurysm showing thrombus (arrows)

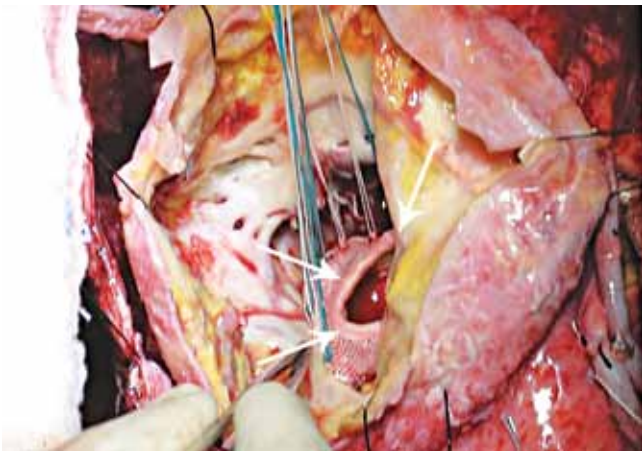


Figure 5. Mitral valve excised and replaced with #29 C.E. bioprosthesis via left ventricle (arrows)



Figure 6. Completed linear closure of ventriculotomy buttressed with Teflon strips (arrows)

wall. In a limited number of cases, it may arise from the inferior or posterior wall and, if the papillary muscles are involved or displaced, it may generate mitral incompetence.<sup>2</sup> Many papers suggest that the optimal surgical repair be directed not only to remove the aneurysm but to reshape the ventricular cavity because in aneurysmal LV, the myofiber orientation is altered to a more transverse axis, leading to increased sphericity and dilatation of the ventricle. Elliptical shape is an important determinant of the LV function, which can be accomplished through an extracardiac approach using a patch to restore the original myocardial geometry and dimension.<sup>3</sup>

Posterior ischemic aneurysm is often complicated by mitral regurgitation, as was the case in our patient; consequently, an extracardiac approach across the aneurysm should be considered an option to treat both lesions in the same manner.

In conclusion, this technique, albeit technically challenging, seems to confer optimal result. Furthermore, closure of ventriculotomy avoids any untoward bleeding complications and thus should be contemplated in cases with combined mitral incompetence and LV aneurysm.

## References

1. Galiñanes M, Duarte J, de Caleyá DF, Sarnago F. Posterobasal left ventricular aneurysms: clinical results and surgical treatment. *Tex Heart Inst J* 1984;11:146-152.
2. Da Col U, Di Bella I, Ramoni E, Affronti A, Rossi A, Ragni T. Repair of posterior left ventricular aneurysm through transatrial approach. *J Card Surg* 2010;25:23-25.
3. Grossi EA, Chinitz LA, Galloway AC, Delianides J, Schwartz DS, McLoughlin DE, Keller N, Kronzon I, Spencer FC, Colvin SB. Endoventricular remodeling of left ventricular aneurysm. *Circulation* 1995;92:II98-100.

## Discussion

Post-infarct LV aneurysm generally involves the anterior