Case Report

Repair of Post-Infarction Ventricular Septal Rupture and Ventricular Aneurysm: A Case Report

Das D[1], Rahman CMM[2], Sazzed M[3], Mursalin G[4], Khan OS[5], Hoque MR[6]

Abstract

Ventricular septal rupture is one of the fatal complications of acute myocardial infarction. With the advancement of medical management and availability of emergency cardiac care, the incidence of post infarct ventricular septal rupture has reduced considerably. We report a case, unique in being a late presentation of post infarct ventricular septal rupture with left ventricular aneurysm. The Ventricular septal rupture was repaired using a PTFE patch, followed by reinforced linear closure of aneurysm by a glutaraldehyde treated pericardial felt and revascularization using reversed saphenous vein graft to left anterior descending artery. The patient survived surgery with an uneventful postoperative course.

Keywords: Myocardial Infarction, Ventricular Aneurysm, Coronary Artery Bypass Surgery, Ventricular Septal Rupture, Pericardial Felt.
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Introduction

Ventricular septal rupture (VSR) is a fatal complication following acute myocardial infarction (AMI)[1]. As it can progress at any period, it warrants surgical or device closure. When treated medically, post infarct VSR has a higher mortality rate (90%), than that of surgical intervention (19-60%)[2]. With the advancement of medical management and availability of emergency cardiac care, the incidence of post infarct ventricular septal rupture has reduced considerably (1-2%)[3].

We report our experience in dealing with a case of post infarct VSR repair, ventriculoplasty for left ventricular (LV) aneurysm (modified SAVER procedure) and on pump coronary artery bypass graft (CABG) surgery.

Case report

A 40-year-old diabetic, hypertensive male patient presented to us with a history of anterolateral Myocardial Infarction (MI) two months back with effort angina (CCS ii) and dyspnea (NYHA iii). Except for the presence of a systolic thrill, pan systolic murmur in left para sternal area, his physical examination revealed no abnormality.

The color Doppler echocardiogram shows biventricular regional motion wall abnormality and a rupture in the mid portion of the muscular inter ventricular septum (3x4 mm). His ejection fraction was 27% revealing severe LV dysfunction. He had osteo proximal stenosis of 90% and total occlusion thereafter at LAD with normal flow at LCX and RCA in coronary angiogram. Myocardial Perfusion Imaging (MPI) revealed hibernating myocardium in the LAD territory.

We performed PTFE (Synthetic Poly Tetra Fluoro Ethylene) patch repair of VSR and CABG after establishing standard cardiopulmonary bypass (CPB) with bi-caval and aortic cannulation. Left ventriculotomy was performed through the infarcted zone. VSR was identified (Figure-1) and repaired with PTFE patch using 4/0 pledged prolene with interrupted sutures (Figure-2). This was further reinforced with continuous prolene sutures in the second layer. Gluteraldehyde treated pericardial felt was prepared. The left ventricle was closed in two layers after placing pericardial felt along the ventriculotomy margins (Figure-3). The First layer was closed using horizontal mattress and the second layer by continuous suturing technique with two 4/0 prolenes. A reverse saphenous vein graft was placed at the left anterior descending artery (LAD) for revascularization (Figure-4). Following surgery, the patient had an uneventful recovery and went home on the 12th postoperative day in a hemodynamically stable state.

[1]Debasish Das, Resident Surgeon, Dept. of Thoracic Surgery, Dhaka Medical College Hospital, Dhaka, Bangladesh.
[2]C. M. Mosabber Rahman, Assistant Registrar, Dept. of Cardiac Surgery, Dhaka Medical College Hospital, Dhaka, Bangladesh.
[3]Md. Sazzed-Al-Hossain, Assistant Registrar, Dept. of Cardiac Surgery, National Institute of Cardiovascular Disease, Dhaka, Bangladesh.
[4]Golam Mursalin, Registrar, Dept. of Thoracic Surgery, Dhaka Medical College Hospital, Dhaka, Bangladesh.
[5]Omar Sadeque Khan, Assistant Professor, Dept. of Cardiac Surgery, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh.
[6]Md. Rezwanul Hoque, Professor and Unit Chief, Dept. of Cardiac Surgery, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh.

Address of Correspondence: Dr. Debasish Das, Resident Surgeon, Department of Thoracic Surgery, Dhaka Medical College Hospital, Dhaka, Bangladesh. Mobile: +8801717431636. Email: dev164@yahoo.com

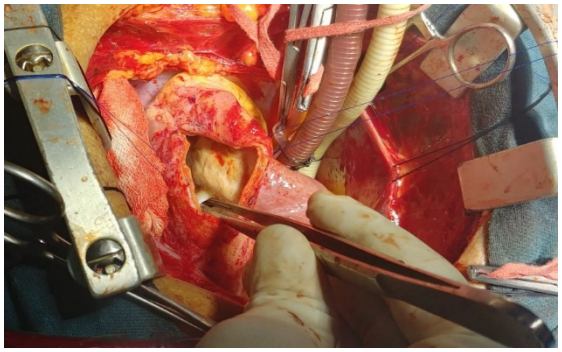

Figure-1: Photograph showing ruptured portion of the ventricular septum (Forceps inserted)

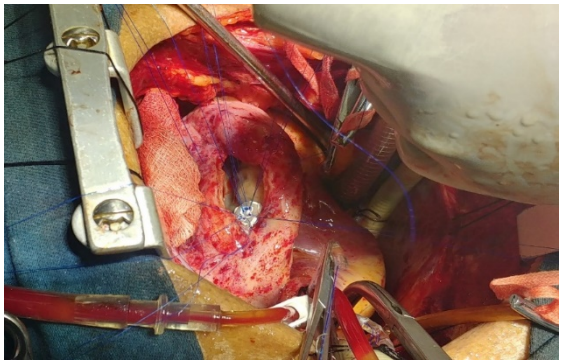

Figure-2: Photograph showing PTFE patch closure of Ventricular septal rupture

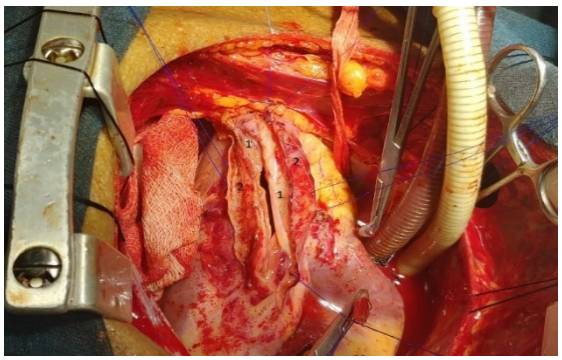

Figure-3: Photograph showing pericardial buttress closure of ventriculotomy (1= Ventricular wall, 2= Pericardial felt)

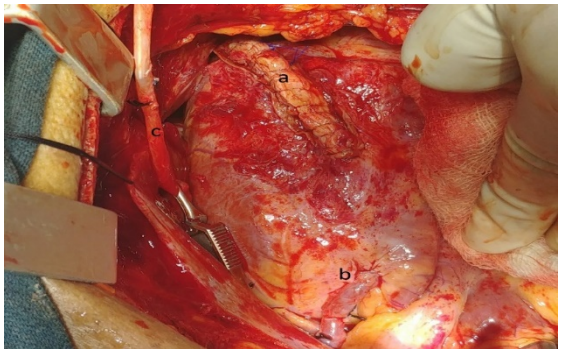

Figure-4: Per Operative photograph after completion of surgery (a = closure of ventriculotomy, b = distal anastomosis of RSVG to LAD, c = Saphenous venous conduit)

Discussion

VSR is a rare but serious complication of myocardial infarction that is often fatal without proper intervention. Women are more common victims than man[4]. Post infarct VSR is very common among asymptomatic patients without any history of Coronary Artery Disease (CAD)[5]. This patient was of the same nature and had a massive MI with the development of VSR, detected 14 days after the incident while getting medical management at hospital.

Current American College of Cardiology – American Heart Association guideline for surgical repair of post infarct VSR and ventricular aneurysm is based on six principles. These are to obtain hypothermic cardiopulmonary bypass and optimum myocardial protection, approach to post MI VSR via a ventriculotomy through the infarcted wall, use of prosthetic or autologous material to reconstruct the VSR and ventricular walls while preserving the geometric configuration of the ventricles, repair of mitral valve if need and revascularization by CABG[6]. The principles of this current guideline were strictly followed during our surgical procedure.

Circular patch repair as described by Dor V, et al[7]. is based on the idea that all apical scars will be excluded from ventricle. This procedure is most suitable for apical aneurysms[8]. Longitudinal repair as described by Cooley DA, et al.[8] includes a longitudinal ventricular incision, excision of aneurysmal tissue and closure with a heavy non-absorbable propylene suture re-enforced with felt strips. Due to an old MI and consequent development of anterior aneurysm in our patient, we preferred the longitudinal repair.

Early device closure of VSR using a trans-catheter approach is less invasive and may improve patient survival when performed early and in cases of favorable anatomy. The drawback in such a procedure is the development of fragile necrotic tissue around VSR, which may dislodge and increase the VSR size while attempts are made to pass the closure device through it[9,10]. Due to this potential risk and late presentation (2 months), we opted for surgical closure.

Conclusion

Post infarct VSR has a higher mortality rate when managed medically. Asymptomatic post infarct VSR can increase in size at any point of time. As such, early surgical closure with revascularization yields a satisfactory outcome.

Conflict of interest

The authors declare that there is no conflict of interests regarding the publication of this paper.

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