Case Report

# POST MYOCARDIAL INFARCTION INTERVENTRICULAR SEPTAL ANEURYSM WITH VENTRICUALR SEPTAL RUPTURE A SURGICAL CHALLENGE TO REPAIR: A CASE REPORT

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ABSTRACT:
Post transmural myocardial infarction thinning and dilatation of myocardium can result in aneurysm formation. Incidence of aneurysm of muscular ventricular septum is rare as compared to membranous septum as only a few cases of dissecting septal aneurysm have been reported. In most of the cases there is previous history of myocardial infarction with highest incidence in patients who did not receive fibrinolytic therapy. We report a case of 70 years old male who presented with chest pain and subsequently diagnosed with inter-ventricular septal aneurysm communicating with right ventricle with left to right shunt.
KEY WORDS:Inter-ventricular septal aneurysm, Ventricular septal rupture, Post myocardial infarction complications.
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## INTRODUCTION:

Ischemia resulting from acute myocardial infarction makes the vulnerable myocardium susceptible to wall stress resulting in infarct expansion, which by thinning and dilatation of myocardium can result in aneurysm formation[1]. Scarring of necrotic wall results in replacement of cardiomyocyte by fibrous tissue which in response to increased intracavitary pressures causes further dilatation[2]. Incidence is highest among patients who failed to receive reperfusion with 10-30% reported in literature but only a few cases of septal aneurysm with ventricular septal rupture are reported[2].In approximately 0.2-0.3% of infarctions this inflammatory process can result in pseudoanneurysm formation[3].Early diagnosis and timely intervention can save patients life.

## CASE REPORT:

A 70 years old male presented to Punjab institute of cardiology with history of chest pain for 48 hours. There was no previous history of ischemic heart disease, and no risk factor present regarding diabetes mellitus, hypertension, hyperlipidemia and smoking. ECG was done which showed ST segment elevation in inferior leads with Q waves and inverted T -waves. On general physical examination a pan-systolic murmur was audible in precordium on right sternal edge. Echocardiography was done which showed large interventricular septal aneurysm draining into right ventricle resulting in left to right shunt with fair left ventricular systolic function. All routine test were performed which were normal. CT scan was done for proper definition of anatomical structures and to discuss further plan regarding surgery. 64 slice MDCT was done of this patient to delineate Left Ventricular aneurysm and its dimensions.Contrast enhanced images of cardiac chambers showing Left ventricle (LV), Right ventricle(RV) , Left Atrium (LA) and Right Atrium (RA) thinning of inferior septum with rupture of basal septum causing an out pocketing of septum forming Pseudoaneurysm(PA). This Pseudo aneurysm is bulging into RV, resulting in impaired RV function. There is also a communication with RV of this pseudo aneurysm. The mitral valve apparatus was intact and the mitral valve was competent. The maximum dimension of pseudo aneurys was 37x37 mm with neck measuring 17 mm. There was no clot in pseudo aneurysm .The volume based LV function was impaired and was moderate with ejection fraction of 41% .The volume based Ejection fraction of RV was 23 % with evidence of two vessel coronary artery disease. Case was discussed with surgical team and considering it a challenge case family was counseled and high risk consent was taken. So Doors repair procedure was performed for interventricular septal aneurysm and ventricular septal defect was directly repaired under intra operative transesophageal echo guidance. Procedure was successful and patient showed good response to surgery. Follow up transthoracic echo showed successful repair with no residual leak. Patient s condition got improved and he was discharged on 12th post operative day from hospital .He is on regular follow up with no active complaint.

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Figure 1 ECG at the time of presentation.

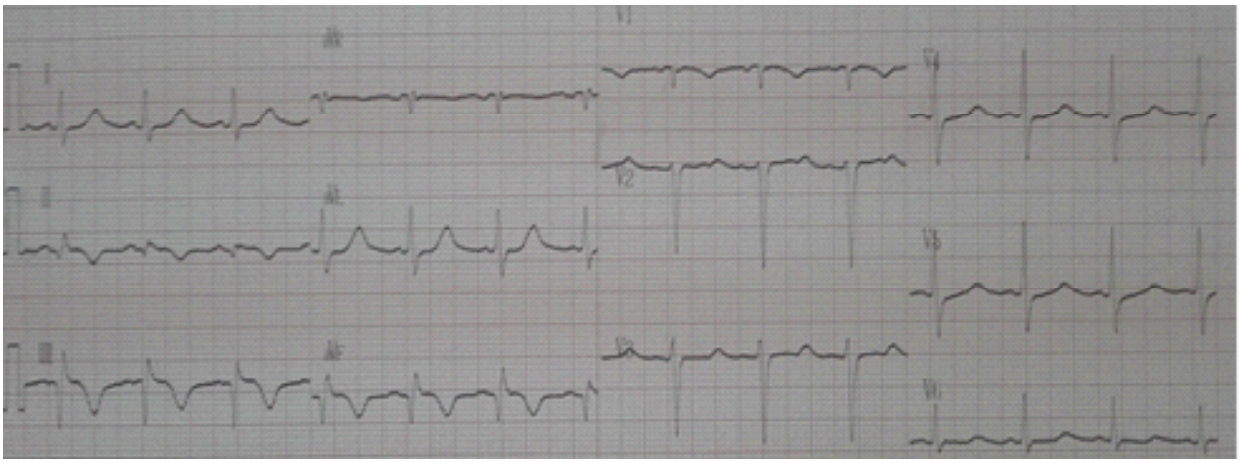
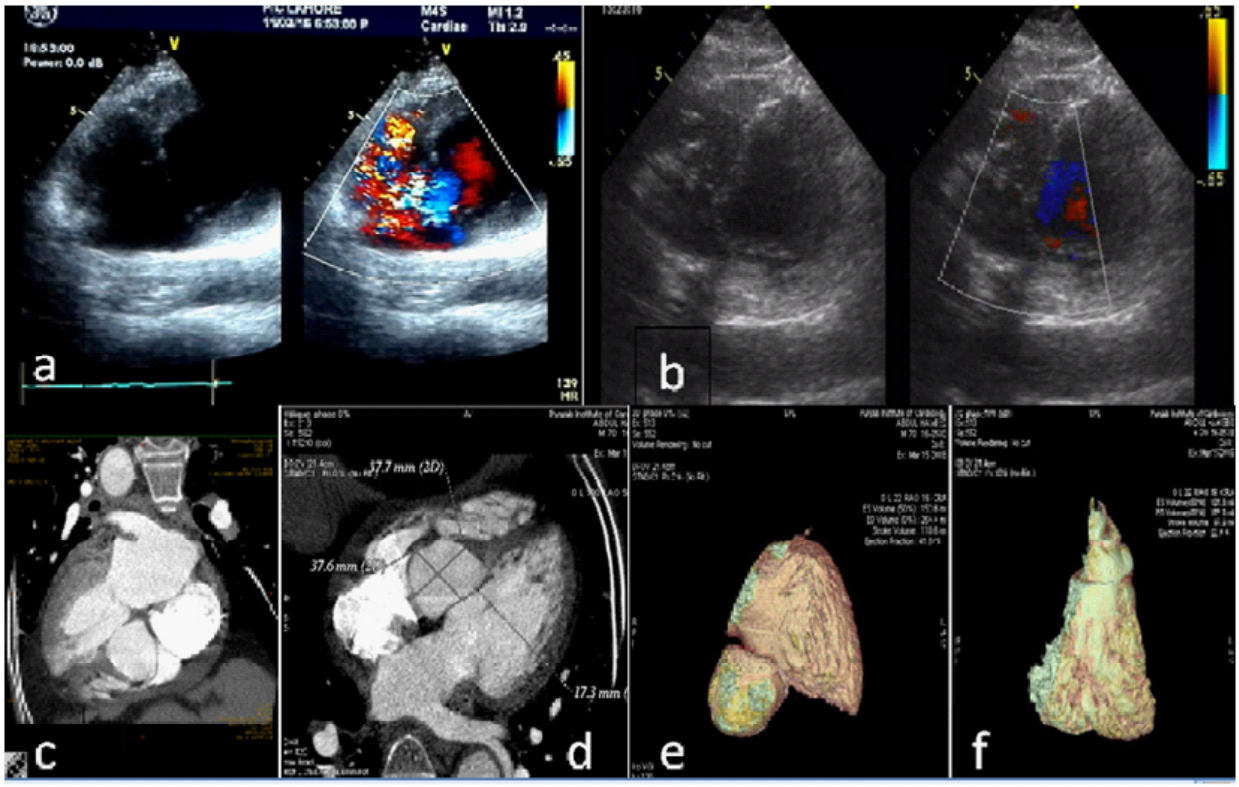


Figure 2: Different Imaging Modalities

a) TTE showing aneurysm of septum with communication to Right Ventricle b) Intraoperative TEE showing no residual defect after repair c-e) MDCT contrast enhanced images showing thinned out septum with pseudo aneurysm protruding in right ventricle with septal rupture, volume base images reduced biventricular systolic function.




## DISCUSSION:

Left ventricular remodeling secondary to ongoing inflammatory process after acute myocardial infarction results in infarct expansion accompanied by non-infarct hypertrophy. This ongoing inflammatory process results in progressive left ventricular dilatation and other factors that can contribute include wall stress, infarct expansion and defective wound healing. End result manifests as adverse clinical outcome[4].

Left ventricular pseudo-aneurysm is a rare complication with documented incidence of 0.2-

0.3% and only a few cases of interventricular septal aneurysm with ventricular septal rupture in right ventricle are reported. Most cases are reported who failed to get fibrinolytic therapy [2-3].The incidence of rupture of left ventricular pseudo aneurysm is more than true aneurysm. As a fact hemodynamics of this condition are similar to post myocardial infarction ventricular septal rupture, heart failure doesn't develop immediately because the perforation develops in sub-acute or chronic phase of myocardial infarction. Persistent left to right shunt gradually worsens pulmonary vasculature and left ventricular function[4].Diagnostic modalities include echocardiography, cardiac CT, cardiac MRI and cardiac cath. Echocardiography being the basic screening tool which can detect aneurysm even in asymptomatic patients recovering from acute phase of myocardial infarction, segmental wall motion abnormality and direction of shunt with the help of color Doppler. Transesophageal echocardiography is as beneficial in detecting pseudoanneurysm as CT scan[5] .64 slice Multi Detector Computerized Tomography MDCT has emerged as imaging modality of choice for detection of structural abnormalities of heart such as aneurysms and pseudo aneurysm and evaluation of coronary arteries. This has been made possible because of high spatial and temporal resolution. Early and accurate diagnosis is possible with MDCT which helps in accurate location of this complication. It can give three dimensional data in the form of volume rendering (VR) images. MDCT is non invasive and can provide rapid, early and accurate assessment of this complication for better treatment strategy. The functional assessment of LV and RV can also be done with MDCT data[5-7].

Surgery is the definitive treatment but challenging with ventriculotomy, ventricular reconstruction, and interventricular septal patch repair with concomitant coronary revascularization. Post operative mortality is high; death is mostly due to poor left ventricular systolic function and rarely from technical difficulties. Intraoperative transesophageal echocardiography is a simple way used to rule out residual leaks[8].Post-surgical pseudo anneursyms can occur and technical failure of previous ventriculotomy is the main cause[9].

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