

# Going Hybrid for Cardiac Procedures

## Surgical Repair of Post-Myocardial Infarction Ventricular Septal Defect

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Post-MI VSD is a known complication in 0.2% of cases and requires urgent surgical closure. A scarred anterolateral myocardial wall with LV aneurysm is routinely found, making it ineligible for LAD artery area revascularization. In view of acute inflammatory reaction, fibrinous pericarditis leads to difficult access to the target lesions, and issues of competent flow into the target lesions makes treatment very challenging.

Surgical repair of post-myocardial infarction (MI) ventricular septal defect (VSD) has been a challenging procedure. Anterior or apical VSDs are seen in 60% of patients with post MI VSD. Post infarction VSD is generally associated with complete obstruction of the coronary artery, usually the LAD (left anterior descending coronary artery). Severe stenosis may coexist in the right coronary artery.

Since most of these patients are critically ill, management and surgical correction is a challenge. We present a similar case of post MI VSD with LV (left ventricular) aneurysm (fig. 1)

which underwent a hybrid procedure at K G Deshpande Memorial Hospital in Nagpur, India.

The following case is a difficult, high-risk procedure. It shows what is possible in a hybrid operating room from a technical and clinical perspective. It's also an excellent example to show how surgeons and cardiologists can successfully work together to treat the patient effectively in a single procedure.

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### Patient history

A 57-year-old male suffered from acute MI with CCF (congestive cardiac failure).

### Diagnosis

Post MI apical VSD with LV aneurysm (fig. 1, arrow) and LVEF of 30%. ECG showed a large anterior wall MI. Chest radiograph showed cardiomegaly with

pulmonary plethora and right pleural effusion. 2D echocardiography showed multiple apical VSD with L R shunts. He had a PA (pulmonary artery) pressure of 60 mm Hg. The coronary angiogram showed a left dominant circulation with LAD proximal 70% discrete lesion.

### Treatment

Patient presented to us at two weeks of MI with above findings. He was medically optimized and taken for a planned hybrid procedure to dominant LCX (left circumflex artery) three weeks after acute MI.

Bilateral femoral artery access was taken for coronary intervention and possible need of intraaortic balloon pump/IABP. Intraoperatively there was pericardial pericardial effusion with large peel over the pericardium as well as the heart, which was dissected from pericardial adhesions.

There was a large LV aneurysm. Patient was put on CPB with ascending and bicaval cannulation and antegrade cardioplastic arrest was achieved and patient cooled to 32 degrees.

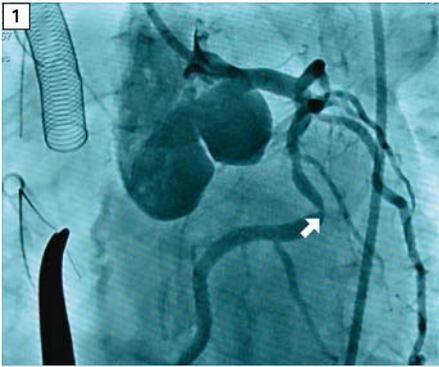


I went to China in 2008 for a conference on 'Hybrid approach to cardiac diseases'. To my surprise there were over 200 papers for hybrid management. It was then I

realized that the hybrid OR is the future in cardiac surgery in treating the patient in one sitting, so that the procedures are economical, the intra- and post-operative morbidity is lower, and clinical

outcomes for the patient are improved. There are plenty of medical emergencies in which patient needs to be rushed from the cath lab to the OR, e.g., perforation of RV/RA

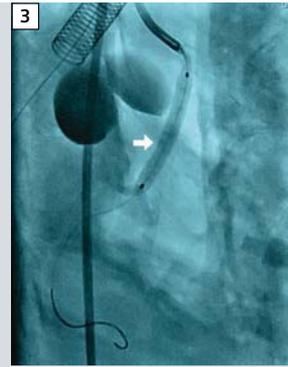
in pacemaker implantation. LAD obstructions are best treated by LIMA (left internal mammary artery) to LAD through MIDCAB (minimally invasive direct coronary artery bypass) procedure.



**1** Myocardial infarction associated with obstruction of the coronary artery.



**2** Insertion of the guidewire via right transfemoral approach.



**3** Inflation of the balloon for placing the stent.



**4** Visualization after stenting of the LCX shows good results.

The VSD was closed by double patch technique by biventricular approach using interrupted pledgeted sutures over the teflon felt on LV side. LV aneurysmectomy was performed, right and left ventriculotomy were closed by Batista technique. After deaeration, the aortic cross clamp was removed and the patient could be rewarmed. The cardiologist used

a right transfemoral approach for the PTCA with stenting of the LCX using 3.5 x 24 mm driver stent (Medtronic) with good result (fig. 4).

The patient was weaned off CPB and on moderate isotropic support without IABP and had an uneventful postoperative course.

Post-operative echo showed a tiny residual VSD on day three and no VSD on day

nine after the surgery. Angiography on day seven showed a fully patent LCX stent and LV angiography did not reveal any residual VSD and the LVEF was 45 %.

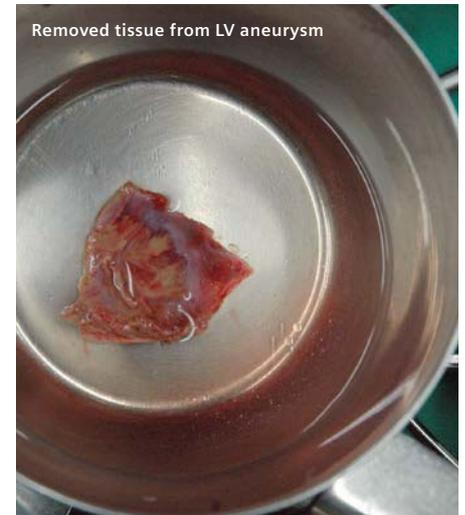
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“I see that in the next few years, most of the cardiac ORs will be hybrid ORs.”

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LCX on the other hand can be treated with angioplasty. These cases can be treated in hybrid OR itself without shifting patient. In children with large collaterals in cyanotic conditions,

collaterals can be blocked, and then corrective procedures can be performed. Septal defects can also be effectively treated in the hybrid OR. AAA/TAA (abdominal aortic

aneurysm / thoracic aortic aneurysm) cases need access of femoral artery for minimally invasive endovascular repair, which are supported by applications like *syngo DynaCT* in the hybrid OR.

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