

# VASCULAR PLUG OCCLUSION OF MITRAL PARAVALVULAR LEAK IN A CASE OF DOUBLE VALVE REPLACEMENT

**Parag Barwad,<sup>1</sup> Ashish Tiwari<sup>2</sup>**

1. Associate Professor, Department of Cardiology, PGIMER, Chandigarh, India, 160012

2. Senior Resident, Department of Cardiology, PGIMER, Chandigarh, India, 160012

## HISTORY AND PHYSICAL

A 45 year old male presented with dyspnea on exertion for 6 months, progressive in nature. The patient had underwent metallic double valve replacement 1 year before for rheumatic heart disease with severe mitral and aortic valve involvement (severe mitral stenosis, moderate mitral regurgitation and severe aortic stenosis). On examination the patient had well audible clicks of both valves with a pansystolic murmur in mitral area.

## IMAGING

Transthoracic echocardiographic evaluation showed severe left atrioventricular valve (AV) regurgitation caused by paravalvular leak (PVL). Transesophageal echocardiography (TEE) showed a PVL, 2 from medial side of valve. He also had a severe left ventricular (LV) systolic dysfunction (pre-existent prior to double valve replacement), coexistent with the PVL.

## INDICATION FOR INTERVENTION

As the LV dysfunction was pre-existent to DVR and the only reason for a new onset symptom found on investigation was a severe PVL, it was considered to close the PVL. Both surgical and percutaneous approaches were discussed in detail in the interdisciplinary meeting. However, a percutaneous approach was considered as first choice in view of it being less invasive and to avoid high risk of redo surgery with severe LV dysfunction.

## INTERVENTION

Procedure was performed under general anaesthesia and TEE guidance. Activated Clotting Time (ACT) was kept in between 250 – 350 during the procedure by i.v unfractionated heparin boluses. On TEE evaluation there was a single opening on the LV side and 2 jets opening on the LA side. The largest diameter measured in TEE was around 6 mm and thus it was initially planned to put an 8 mm vascular plug in the defect.

Right sided femoral vein and arterial access was obtained. Percutaneous access to LV, to take a LV angiogram for localizing the leak on fluoroscopy was restricted in view of both aortic and mitral valve being replaced with a metallic prosthetic valve. Apical access to LV was discussed, but was kept as a last resort. Through the right femoral approach atrial septal puncture was performed with the help of Fast Cath™ transseptal guiding introducer SL 0 curve and Brockenbrough septal puncture needle. The Fast Cath guiding introducer was then exchanged to an Agilis™ NxT steerable introducer. The use of Agilis™ steerable system helped to provide a desirable curve in seeking the PVL along the mitral annulus as we did not have a LV angiogram to demonstrate the site of the PVL jet. Through the Agilis™ steerable system, we introduced a 6F Judkind Right (JR) guiding catheter and with the help of 0.035" Terumo hydrophilic guidewire the PVL was crossed. The JR catheter was thus advanced into the LV over the guidewire. Initially an 8 mm vascular plug was deployed in the PVL, however, a persistent leak was found on TEE. Thus the 6F JR guide was exchanged to a 7F guide and a 12mm vascular plug was deployed in the defect (Figure1). Flow across the defect sealed in next 15 min. The

stability and positioning of plug was confirmed on both TEE and fluoroscopy and the plug was released of the deliver cable. There were no peri-procedural complication and patient was discharged on day 3 of procedure. Currently he is doing fine with NYHA class II status on medications for DVR and LV dysfunction.

### LEARNING POINTS OF THE PROCEDURE

1. Paravalvular regurgitation affects 5% to 15% of all surgically implanted prosthetic heart valves.
2. Paravalvular leak closure is a complex procedure with varying success rates. Sometimes it can be extremely challenging in patients with double (mitral and aortic) valve replacement, as we cannot localize the site of leak on fluoroscopy to guide crossing the defect. Transapical approach to gain an access to LV has been tried by many in the past, however our experience with transapical puncture for LV access is less.
3. We describe here a closure of a large PVL using an Amplatzer Vascular Plug type II completely guided by TEE.
4. We used a steerable introducer Agilis™ (which is predominantly used in electrophysiological procedure) to help manure the guiding catheter to cross the PVL.
5. This case demonstrates an excellent combination of experience gained in different sub-specialties of cardiology to benefit a patient.

Figures:

Figure 1:

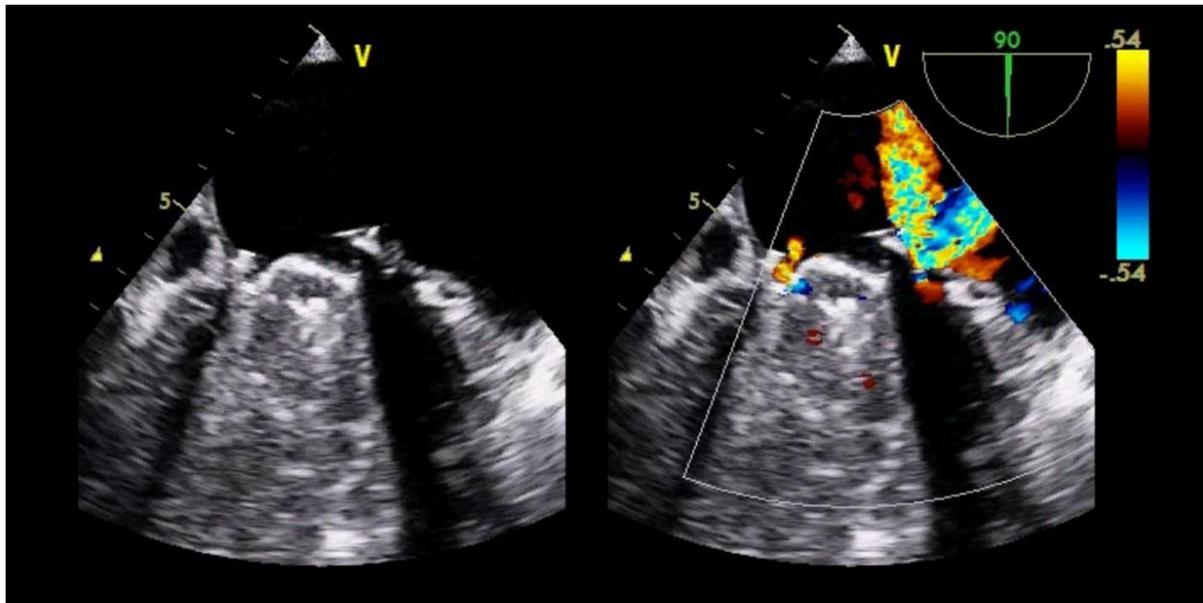


Figure 1. Echocardiography and color flow imaging shows the normal functioning mitral valve and a severe paravalvular leak

Figure 2.

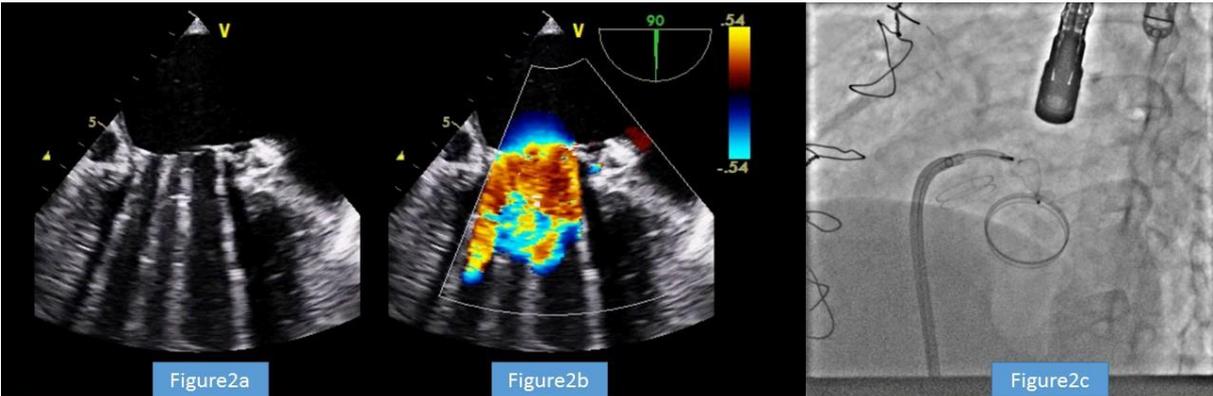


Figure 2. Figure 2a and 2b shows normal functioning of prosthetic mitral valve and no PVL on echocardiography and figure 2c shows Amplatzer vascular plug in the PVL placed transeptally on fluoroscopy.