

## IMAGES IN INTERVENTION

# Redo Mitral Valve Clipping After Partial Clip Detachment

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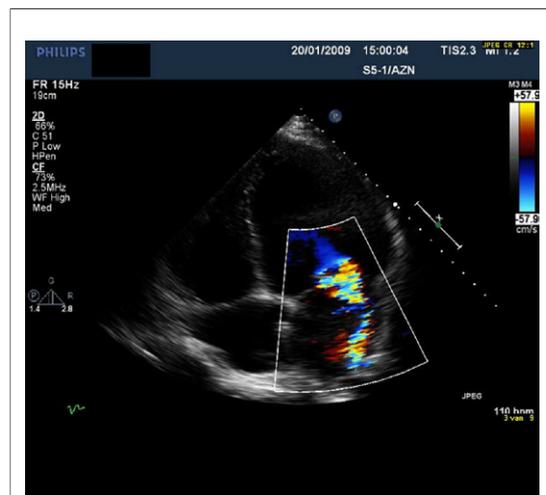
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A 45-year-old male patient, with a history of ischemic cardiomyopathy, peripheral arterial disease, and renal dysfunction, was admitted for percutaneous mitral valve repair. Cardiac magnetic resonance imaging showed an ejection fraction of 18% without viability. Severe mitral regurgitation (MR) occurred due to left ventricular annular dilation and restriction of the posterior leaflet (Fig. 1). Consequently, an important reduction in functional capacity (New York Heart Association class 3) was present. He was declined for surgery because of a predicted operative mortality rate of 36% (logistic EuroSCORE) and accepted for the percutaneous approach.

The procedure was performed under general anesthesia and guided with fluoroscopy and transesophageal echocardiography (3D-TEE, Philips probe, transducer X7-2t, Philips Healthcare, Best, the Netherlands). Access was gained using the right femoral vein, and after transeptal puncture the clip delivery system was advanced into the left atrium. The clip was successfully delivered into the left ventricle just below the mitral valve annulus and retrieved in the center of the maximal jet of the MR, which was located medial to the center of the annulus. After grasping the mitral valve leaflet edges, the clip was closed and released, creating a double mitral valve orifice. Unfortunately, 24 h later, transthoracic echocardiography showed clip detachment from the anterior mitral leaflet (Fig. 2A) without reduction in MR (Fig. 2B). A second clip was placed more centrally to maintain a better coaptation of the 2 leaflets (Fig. 3). The procedure was uneventful, and echocardiography confirmed adequate positioning of the second clip with substantial reduction in MR (Fig. 4). Reviewing the echocardiographic studies, the first clip was positioned too far to the medial (P1-A1) coaptation line. The selection of this position was guided upon what we assumed to be the maximum jet of regurgitation. Ob-

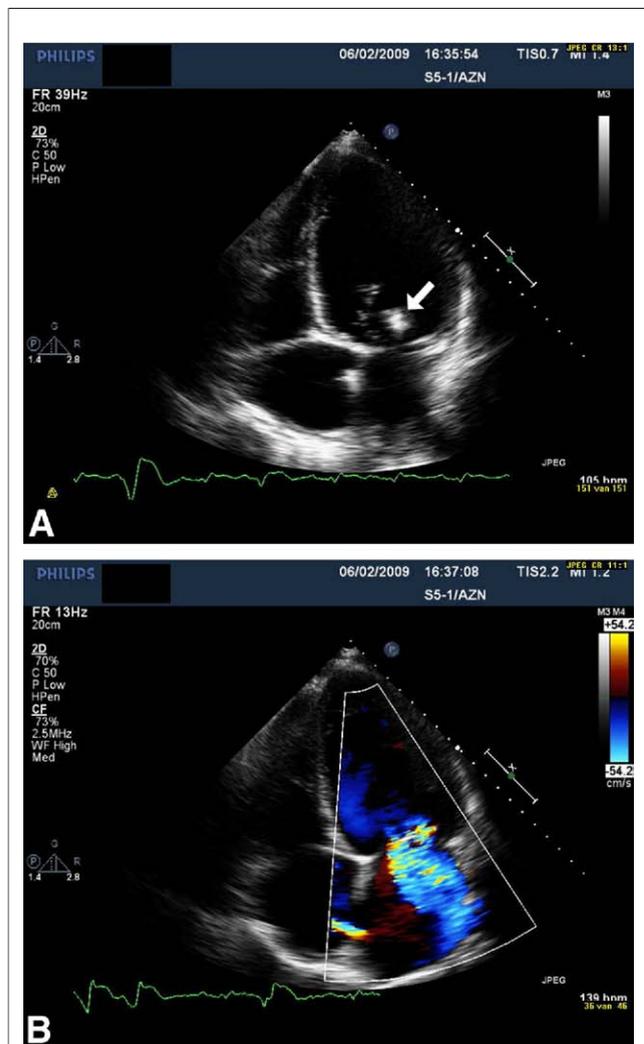
viously, the real maximum jet was originating more lateral. Most probably, favoring the medial site, insufficient leaflet insertion was obtained. The patient was discharged 5 days later without clinical events related to the clip detachment. At 1 month, echocardiography showed mild MR (grade 2), unfortunately without clinical improvement. Because of persistent heart failure, he received a biventricular implantable cardioverter-defibrillator 3 months later.

Theoretically, partial clip detachment holds an increased risk of endocarditis, thrombus formation, and clip dislodgment with embolization. Therefore, we treated the patient with warfarin and clopidogrel.



**Figure 1. 2-Dimensional 4-Chamber Transthoracic Echocardiographic Image Showing a Severe, Eccentric MR Jet**

There is an important mitral regurgitation (MR) (color jet), due to left ventricular annular dilation and restriction of the posterior mitral valve leaflet. Consequently, the MR jet is orientated to the posterolateral wall of the left atrium and almost reaches the right upper pulmonary vein.

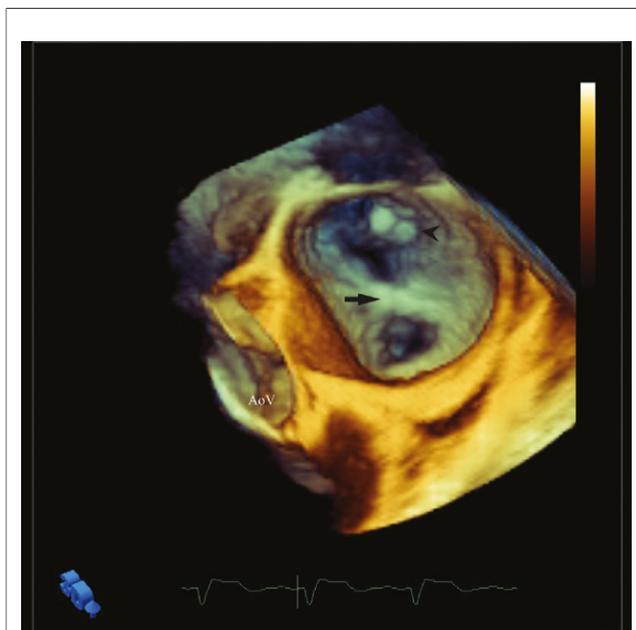


**Figure 2. 2-Dimensional 4-Chamber TTE Image After Partial Clip Detachment**

(A) This image shows clip detachment from the anterior mitral valve leaflet. The clip (arrow) is only attached to the posterior mitral valve leaflet. (B) With color Doppler imaging, an even more important MR is recognized, with an MR jet area accounting for more than one-half of the left atrium area. An iatrogenic atrial septum defect is seen after transeptal puncture. Abbreviations as in Figure 1.

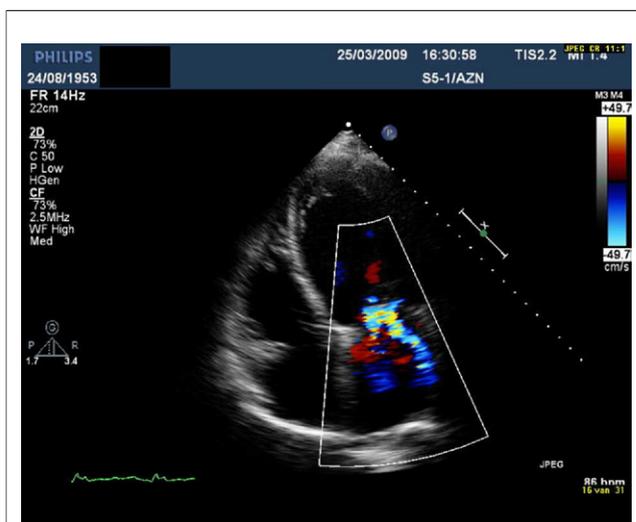
Furthermore, lifelong endocarditis prophylaxis was advised. At 6 months follow-up no such complications did occur, which is in line with recent findings of the EVEREST (Endovascular Valve Edge-to-Edge Repair Study) trial investigators (1).

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**Figure 3. 3-Dimensional Transesophageal Echocardiography Image After Successful Placement of the Second Clip**

The first clip (arrowhead) is only attached to the posterior mitral valve leaflet. The second clip (arrow) was placed more centrally, creating a double orifice mitral valve.



**Figure 4. 2-Dimensional 4-Chamber TTE Image Shows Reduction in MR After Second Clip Placement**

This figure shows the final result in a 4-chamber TTE view. There is an obvious reduction in MR. Placement of the second clip has resulted in a central coaptation of the leaflets with a double orifice, creating 2 small MR jets. Abbreviations as in Figure 1.

**REFERENCE**

1. Feldman T, Kar S, Rinaldi M, et al. Percutaneous mitral repair with the Mitraclip system. *J Am Coll Cardiol* 2009;54:686-94.