Image in Cardiology

Two-Dimensional and Three-Dimensional Transesophageal Echocardiography in Mitral Valve Prolapse

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Thirty-five years old female patient presented with progressive dyspnea with congestive symptom for one month. The physical examination found pansystolic murmur grade III/IV at apex radiating to left lower sternal border consistent with mitral regurgitation (MR).

Transthoracic echocardiography (TTE) revealed severe MR due to prolapse of posterior mitral leaflet. Although the adequate initial evaluation by TTE, transesophageal echocardiography (TEE) was performed for more accurately evaluate the mitral valve anatomy to determine the likelihood of a successful valve repair. The images of TEE are shown in Figure 1-3. The anatomical diagnosis from two dimensional (2D) TEE was posteromedial (PM1 and PM2) prolapse with PM2 chordal rupture (Duran's classification)(1).

We also used the real-time three dimensional (3D) TEE to localize the prolapsed segments in this patient. From 3D technique with enface view of mitral valve from the left atrial (LA) perspective, or the surgical view, we found the involving segment or scallop locate at the junction of PM1 and PM2 segments (Duran's classification) or P2 segment (Carpentier classification)(2) with rupture chordae tendinae (Figure 4). The 3D technology is helpful for physician to understand the mitral valve anatomy when compare to the same view in 2D TEE (Figure 5).

From previous studies, 3D TEE showed more accuracy for localization the involved segment in mitral valve prolapse. Pepi et al showed the intraopertative 3D TEE reconstruction identified the correct location of prolapse in 95.6% of patients compare to 2D TTE (77% accuracy) and 2D TEE (87% accuracy) (3). Although 3D echocardiography provided the more comprehensive information and the more accuracy for mitral valve morphology, the application to influence the surgical planning and the clinical outcome need additional studies.

Figure 1. Doppler and 2D TEE at 0 degree, mid-esophagus level (four-chamber view) demonstrated severe MR with anterior eccentric jet. Flail posterior mitral leaflet of PM1 segment (Duran's classification) was also detected.

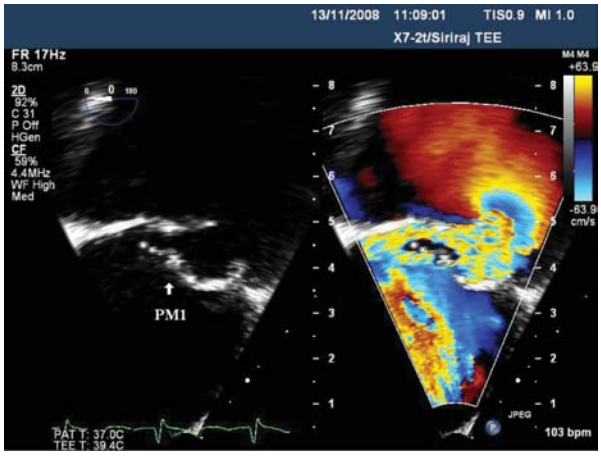


Figure 2. 2D TEE at 90 degree, transgastric level (two-chamber view) demonstrated the rupture chordae tendinae of PM2 segment of mitral valve (Duran's classification).

Figure 3. 2D TEE at 60 degree, midesophagus level (commissural view) demonstrated prolapse of PM1 and PM2 segments of mitral valve (Duran's Classification).

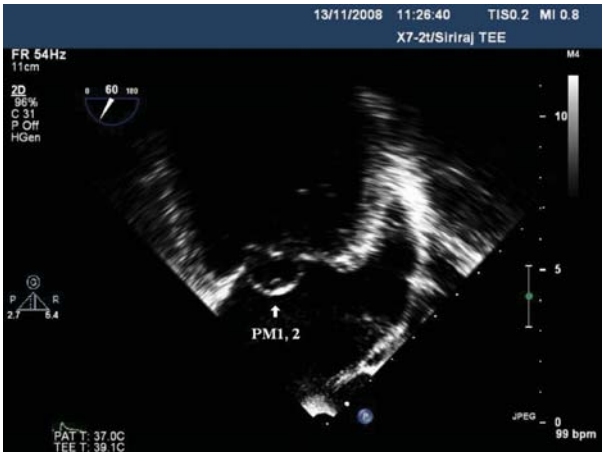
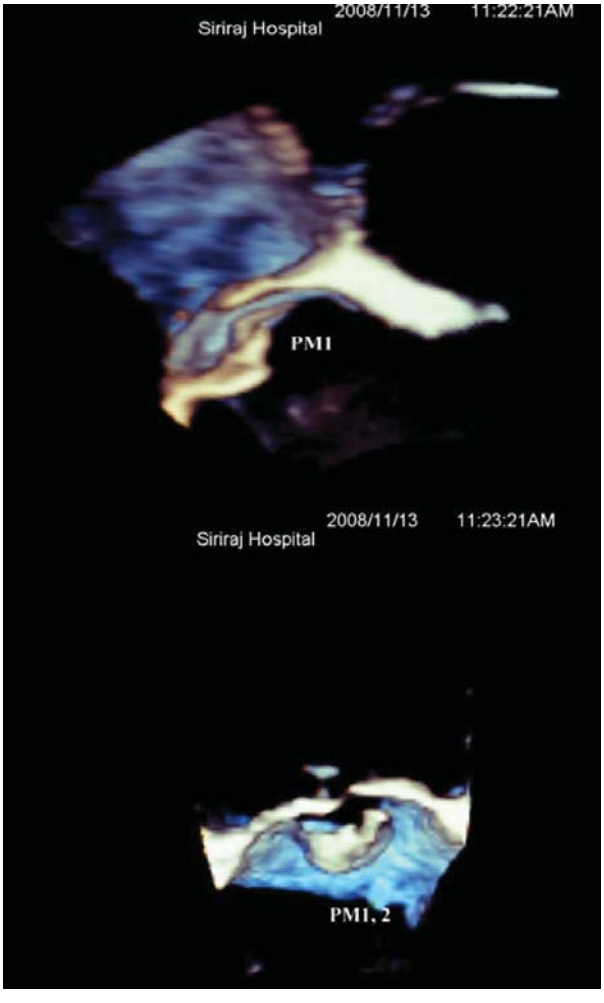


Figure 4. Real-time 3D TEE, the enface view of mitral valve from LA or surgical view, demonstrated prolapse of the junction of PM1 and PM2 segments (Duran's classification) or P2 segment (Carpentier's classification) of mitral valve with chordal rupture

Figure 5. Real-time 3D TEE, the cross sectional view of four chamber (upper) and commisural views (lower) of the mitral valve, comparable with Figure 1 and 3 of 2D TEE, demonstrated prolapse of the junction of PM1 and PM2 segments (Duran's classification) or P2 segment (Carpentier's classification) of mitral valve



References

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