

IMAGES IN CLINICAL MEDICINE

Mitral Valve Prolapse: Novel Assessment With Real-Time 3D Echocardiography

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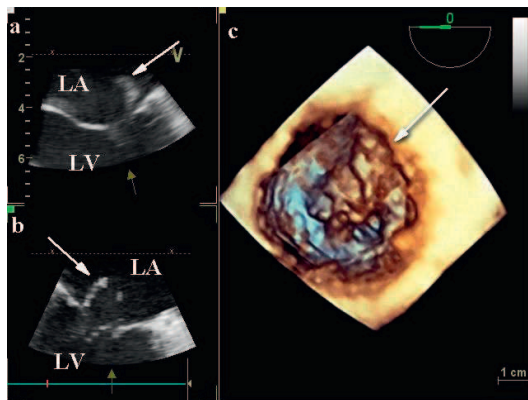


Figure 1. Preoperative Real-Time 3D Transesophageal Echocardiogram. The biplane image of mitral valve prolapse (a, b) shows a set of two orthogonal planes. The left upper panel represents the image at 0°, and the left lower panel shows the image at 90°. The right panel (c) shows an *en face* view of the mitral valve from the left atrial perspective obtained by the three-dimensional (3D) zoom technique. The arrow indicates the flail P2/P3 segment of the posterior mitral leaflet. LA = left atrium; LV = left ventricle.

Mitral valve prolapse (MVP) is the most common cause of mitral regurgitation and the most frequent reason for mitral valve surgery in Europe. The most traditional method for mitral valve evaluation has been two-dimensional (2D) transthoracic echocardiography. However, soon after its development, intraoperative transesophageal echocardiography (TEE) became the preferable imaging method for both the perioperative decision-making process and postoperative evaluation after mitral valve surgery. Improved imaging modalities and implementation of real-time 3D TEE provided *en face* views of the mitral valve from the left atrial perspective, and this method soon became the new gold standard for the diagnosis of MVP. Modern 3D echocardiographic imaging provides three general modalities: volume rendered, biplane or multi-plane, and color Doppler imaging. In this report, we describe the clinical implications of three-dimensional (3D) TEE in mitral valve reconstruction after MVP.

A 57-year-old Caucasian man was admitted to the hospital with dyspnea due to undated mitral regurgitation.

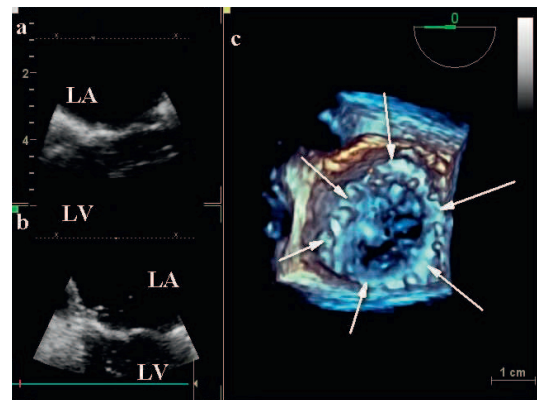


Figure 2. Postoperative Real-Time 3D Transesophageal Echocardiogram. Biplane images (a, b) show a competent mitral valve with good leaflet coaptation. The right panel (c) shows an *en face* view of the mitral valve from the left atrial perspective obtained by the three-dimensional (3D) zoom technique. The arrow indicates the implanted semi-rigid ring. LA = left atrium; LV = left ventricle.

Transthoracic echocardiography on admission revealed severe mitral valve regurgitation due to mitral valve prolapse. Coronary angiography demonstrated normal coronary findings. Intraoperative TEE was performed using a General Electric Vivid E9 and a 6VT-D 5.0 MHz probe, before and after cardiopulmonary bypass (CPB). Regular 2-dimensional (2D) TEE identified posterior mitral valve cusp prolapse due to chord rupture but failed to reveal the complete anatomy of the mitral valve. In contrast, the high quality, real-time 3D TEE images provided accurate assessment of valvular motion, precise location of the MVP, and allowed adequate preoperative planning when reconstruction was being considered [Figures 1 and 2]. The patient's mitral valve was reconstructed by a standard quadrangular resection between the P2/P3 section; a Blalock suture of the resected area was done with T-Cron 4-0 polyfilament suture. Reductive mitral valve annuloplasty was performed by implantation of the semi-rigid ring #28. The patient was discharged seven days after surgery without complications.