IMAGES IN CARDIOLOGY

Heart 2005;91:e55 (<http://www.heartjnl.com/cgi/content/full/91/9/e55>). doi: 10.1136/hrt.2004.055780

Mitral valve anterior leaflet prolapse by real time three dimensional transthoracic echocardiography

Conventional two dimensional (2D) echocardiography and colour flow imaging have been widely used for assessment of patients before and after mitral valve surgery, where the residual severity or elimination of mitral regurgitation (MR) remains the primary outcome measure. We present a 62 year old female patient who complained of increasing shortness of breath in the last year, seven years after previous mitral valve repair for ischaemic mitral regurgitation. Left ventricular minor axis activity suggested significant mitral regurgitation, but conventional colour Doppler criteria suggested only mild mitral regurgitation. Conventional 2D parasternal views showed satisfactory leaflet coaptation and thus inconclusive evidence for scallop prolapse. However, the parasternal long axis view obtained by real time three dimensional (3D) transthoracic echocardiography (TTE) was highly suggestive of anterior leaflet prolapse, and a real time rendered "en face" mitral view localised the prolapse to the A3 anterior mitral valve leaflet. Real time 3D colour flow imaging confirmed the A3 prolapse site as the origin of the regurgitant eccentric jet. Thus, real time 3D TTE can assist in identifying exact cause and location of MR when standard 2D images are inconclusive. In addition, 3D colour flow imaging adds further diagnostic value as to the site and origin of the regurgitant jet.

Supplemental material is available on the *Heart* website (<http://www.heartjnl.com/supplemental/>).

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(A) Parasternal long axis view by 2D echocardiography suggests mild MR at level of leaflet tips. (B) 3D parasternal long axis view is highly suggestive of anterior prolapse because the entire left atrial volume is rendered at the level of the atrio-ventricular ring. (C) Real time 3D "en face" rendering of mitral valve, obtained from parasternal long axis view, clearly shows prolapse in A3 region of mitral valve leaflet. (D) Real time 3D colour flow "en face" view of mitral valve reveals eccentric jet aetiology from A3 region of mitral valve leaflet. To view video footage visit the *Heart* website—<http://www.heartjnl.com/supplemental>