

# The Role of Three-Dimensional Transesophageal Echocardiography in the Assessment of Mitral Prosthetic Paravalvular Leak

Mohamed Ayman AbdelHay, Salah ElTahan, Eman ElSharkaw, Ingy Etman

## BACKGROUND:

Mitral prosthetic paravalvular leak (PVL) is an uncommon yet serious complication. Three-dimensional echocardiography (3DE) is considered superior to 2D echocardiography by which dehiscence sites can be identified with special attention to their location, shape, size and area.

## OBJECTIVE:

The aim of the study is to describe the detailed morphology and characteristics of severe mitral paravalvular leaks using three-dimensional transoesophageal echocardiography (3D TEE).

## METHODS:

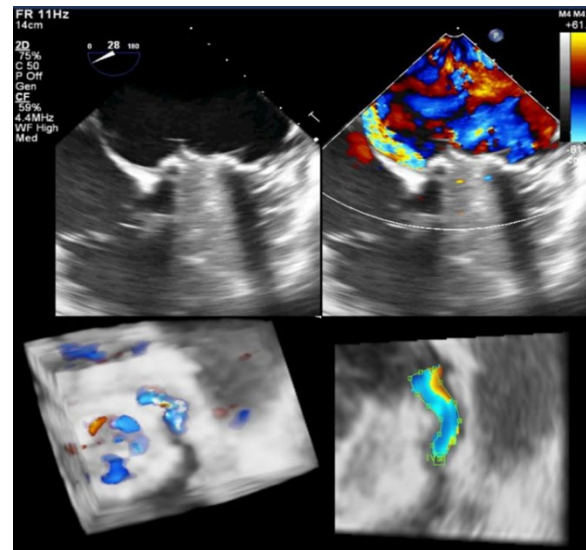
Fifteen patients with severe mitral paravalvular leaks (mean age of  $50 \pm 12$  years, 73% were men) were assessed using conventional 2D TTE and 2D TEE with color Doppler. 3D TEE using 3D zoom and full volume multibeat acquisition modes were used to image mitral prosthetic valve and the paravalvular defect. Paravalvular leaks were described in terms of their shape, size, number and localization.

## RESULTS:

Heart failure was the most common presentation (45%) while hemolytic anemia was the second common presentation (22%).

Mean left atrial diameter was  $64 \pm 6$  mm. Mean LV end diastolic volume (EDV) was  $171 \pm 34$  ml and mean LV end systolic volume (ESV) was  $98 \pm 28$  ml. Regarding mitral prosthetic parameters; : Peak early mitral velocity (E-wave) with mean velocity of  $2.5 \pm 0.35$  m/s , mean diastolic gradient was  $11.5 \pm 2$  mmHg and mean ratio of mitral valve velocity time integral (MV VTI) / left ventricular outflow tract velocity time integral (LVOT VTI) was  $3 \pm 0.58$ .

The mean 2D vena contracta width of the regurgitant jet was  $7.0 \pm 1.1$  mm. Using 3D zoom mode and full volume multibeat acquisition modes, Single regurgitant jet was found in 73% of the cases while 27% had 2 regurgitant jets . The most common sites of PVL were septal (36%) and posterior (26%). The defect shape was oval (31%), rounded (26%), crescent (31%), highly irregular (5%) and full dehiscence (5%). The mean PVL diameters measured by 3D TEE was  $4.8 \pm 3$  mm  $\times$   $3.1 \pm 1.4$  mm and the mean 3D effective regurgitant orifice area (3D EROA) was  $0.69 \pm 0.24$  cm<sup>2</sup>.



## CONCLUSION:

3D TEE can provide accurate description of the number, location, size and morphology of PVLs, which is essential for selecting patients with severe mitral paravalvular leaks who are candidates for device closure and for guiding the procedure.