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**Pre-operative transthoracic real-time three-dimensional echocardiography for a better surgical strategy**

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Abstract
In this study we aimed to evaluate the three-dimensional (3D) transthoracic echocardiography (TTE) in the assessment of cardiac valve morphology.
Methods: Bidimensional (2D) and real-time 3D TTE was performed in 104 patients consecutive with cardiac catheterisation, prior to valve surgery. Using surgical findings as the gold standard, 2D and 3D TTE were compared for adequate recognition and accurate detection of morphology. A scoring protocol was used for recognition of the valvular segments (0=inadequate, 1=adequate).
Results: Adequate echographic visualization of the valve segments was more frequently obtained by 3D than 2D TTE imaging (731/770 by 3D TTE vs. 693/770 by 2D TTE, $p<0.01$). The valve leaflets segments were more clearly identified by 3D TTE rather than by 2D TTE (502/531 vs. 471/531, $p<0.01$). The assessment of commissures was similar by both methods (229/239 vs. 222/239, $p=0.09$). Total 3D TTE scores for mitral and aortic valves were significantly better than 2D TTE scores (mean score 12.91±1.62 by 3D vs 11.58±1.02 by 2D, $p=0.02$). This superiority of 3D TTE was irrespective of rhythm ($p<0.05$ for both sinus rhythm and atrial fibrillation). Using surgical classification of valvular disease as gold standard, the sensibility and specificity were 91% and 84 % for 3D TTE, and 85% and 77% for 2D TTE, respectively.
Conclusions: Real-time 3D was superior to 2D TTE for the accurate localization and identification of valvular pathology, irrespective of heart rhythm.
Key words: transthoracic real-time three dimensional echocardiography, cardiac valve surgery, preoperative echocardiography

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