

Diagnostic Accuracy of Transesophageal Echocardiographic Commissural-Biplane Approach in Identifying Mitral Valve Anatomy.

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Background:

Transesophageal echocardiography (TEE) conventional multiplane approach (MPA) and the newly proposed commissural biplane approach (CBA) are the recommended algorithms for identifying the affected mitral valve (MV) segments. To date, there are no reports to address the diagnostic performance of CBA. In this study we aim to analyze the diagnostic accuracy of CBA and MPA in comparison to three-dimensional echocardiographic findings in patients with severe mitral regurgitation.

Methods:

We prospectively enrolled 102 patients with severe mitral regurgitation. All patients underwent a systematic TEE assessment of MV before surgical intervention to define the affected MV segments/scallops. The standard MPA includes 4-chamber (4-CH), 2-CH, long-axis and commissural views; CBA was performed through obtaining the bi-commissural view and simultaneous biplane imaging of the medial, middle and lateral MV aspects. The findings of both TEE approaches were compared to 3D-TEE data in order to assess the diagnostic accuracy of MPA and CBA .

Results:

Patient's mean age was (65±11) years; 37 (36.3%) were female. We found that CBA has an overall diagnostic accuracy between 88% to 97% in identifying the abnormal MV scallops; in contrast, MPA accuracy ranges between 82% to 95%. CBA and MPA were least accurate in identifying P3 scallop 88% and 82% respectively; whereas, both were most accurate in assessing A2 segment 95% and 97%. The sensitivity of identifying commissural abnormalities was 80% with CBA and 30% with MPA. 3D-TEE found to have a strong agreement with CBA (averaged kappa of 0.81, $p < 0.0001$) and a modest agreement with MPA (averaged kappa of 0.61, $p < 0.0001$) in identifying abnormal anterior or posterior segments. On the other hand, 3D-TEE has a weak agreement with CBA (kappa of 0.43 , $p \text{ value} < 0.0001$), and no agreement with MPA (kappa of 0.14, $p \text{ value} = 0.153$) in the assessment of commissures.

Conclusion:

Commissural biplane approach is more accurate than MPA in the assessment of MV commissural involvement. Given the accuracy differences of the two approaches for specific leaflet scallops, a comprehensive evaluation using both approaches is recommended for maximal accuracy for all MV scallops assessment.