Pre- and Intra-operative management of degenerative MR

Localization of MV Prolapse with TTE and TEE

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Definition of Mitral Valve Prolapse using 2D Echo

- Defined for the long-axis view as end-systolic displacement of the body of the MV leaflet ≥ 2mm above the mitral annular plane.
Saddle Shaped Mitral Valve

**Concave leaflets long-axis view**

**Four chamber view**
Based on a line connecting the annular hinge points in the parasternal or apical long-axis view.
Orientation of Mitral Valve Leaflet and Scallops

Surgeon’s View

TEE View

TTE View
2D TTE Image for Localization of Prolapsed Segments

2D TTE Image for Localization of Prolapsed Segments

Superior tilting (toward to TV)

Inferior tilting (toward to AV)
2D TTE Image for Localization of Prolapsed Segments

Eur J Echocardiogr 2010;11:557
2D TTE Image for Localization of Prolapsed Segments
2D Transesophageal Echocardiography (TEE) Imaging

Hahn RT et al. J Am Soc Echocardiogra 2013:26:921
Schematic of the Mitral Valve with Leaflet Scallop
Examination of the Mitral Valve with TEE
Examination of the Mitral Valve with TEE
Color Doppler

- Depending on the leaflets which are affected, prolaptic leaflet will determine the direction of the mitral regurgitation jet.
- The direction of the jet is opposite to the flail leaflet.
Limitation of 2D evaluation in the mitral valve

- Difficult to figure out 3D morphology of valves
- Operator dependent
- Not guarantee reproducibility and accuracy
Advantage of 3D echo on the pathomorphological changes in the mitral valve

- More windows and unlimited perspective
- Accurate interpretation of lesion localization
- Less reliance on reader’s experience
- Dynamic information in the beating heart
3D Enface View of the Mitral Valve in Motion
Spectrum of degenerative mitral valve disease

Leaflet Tissue

- + FED
- ++ FED +
- +++ Form Fruste
- ++++ Barlow’s

Lang R et al. Comprehensive atlas of 3D echocardiograph
Morphological Diagnosis of MVP in 3D Enface imaging

- Convexity or a bulge into the left atrium compared to the rest of MV
Multi-Planar Reconstructive (MPR) Mode
Interpretation of 3DE images with MPR improved the accuracy of the description of the MVP compared with 2D interpretation.

- This added value of 3D MPR was mostly important in extensive and/or commissural prolapse.

Results: Two-dimensional echocardiography correctly identified the prolapsing leaflets in 32 of 64 patients and 3D MPR in 46 of 64 patients (P = .016). Among the 27 patients with complex pathology (i.e., more than isolated involvement of the posterior leaflet prolapse), 3D MPR identified 20 correctly, as opposed to 6 with 2D imaging (P < .001).
Conclusions

- Localization of prolapsed segment is essential for the surgeon doing a mitral valve repair.
- 2D TTE and TEE are used to accurately assess the mitral valve morphology.
- 3D imaging provides a comprehensive evaluation of the mitral valve morphology especially commissural involvement in degenerative mitral valve disease.
Thank you for your attention