Abstract: **P556**

Estimates of mitral-aortic angle measurement errors in 2D compared to 3D echocardiography

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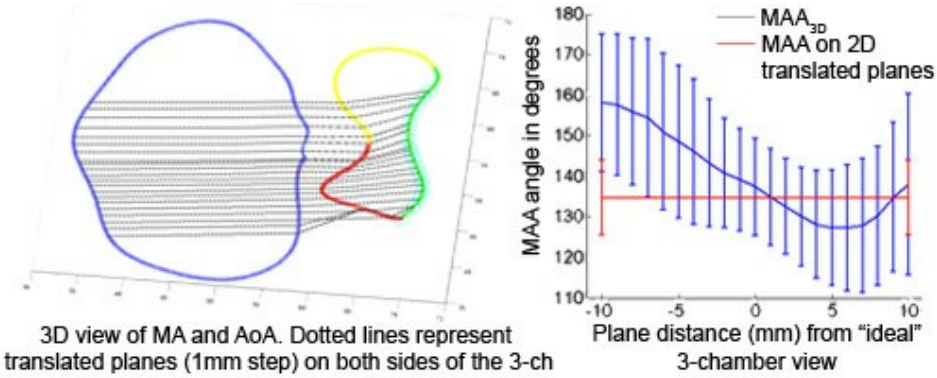
Background: The angle between the mitral and aortic valves (MAA) facilitates blood flow ejection in physiological condition. The narrowing of MAA increases the risk of systolic anterior movement and thus is an important parameter in preoperative evaluation. Usually, MAA is measured in the 2D echo image (2DE) representing the 3-chambers view (3-ch); however, changes in 3-ch view selection may lead to significant changes in the measured 2D angle, due to the 3D shape of the two annuli. Real-time 3D echo (3DE) represents an alternative way to compute MAA. Accordingly, Our aim was to measure the impact of minimal variation in 3-ch selection on MAA computation, compared to MAA measured with 3DE (MAA3D).

Methods: On 3DE data of 24 randomly chosen subjects, aortic and mitral annuli (AoA, MA) were traced using custom software. MAA3D was measured as the angle between the best fitting planes of the two traced annuli. To simulate 2D MAA measurements, the 3D data was sliced: 1) at the position corresponding to 3-ch; 2) using 20; 3) using 40 rotated planes (1 degree step) around MA saddle point. The intersection of the traced annuli with these planes was used to automatically measure MAA in 2D.

Results: MAA3D was 134.7°±9.2° and MAA on 2DE 3-ch was 137.3°±12.0°. MAA measured on translated planes (±10mm) ranged from 137.9°±22.3° to 158.1°±16.9°, while on rotated planes (±20°) ranged from 147.7°±14.4° to 135.6°±12.9°. MAA measured in 2D was significantly different (paired t-test, $p<0.05$) from MAA3D already starting from translation greater than 1mm and rotation greater than 1°.

Conclusions: Even a slight misalignment (>1mm and >1°) of 2D cut-plane from the ideal 3-ch leads to MAA measures that differ from MAA3D. 3DE should be preferred to 2DE for the computation of MAA



3D view of MA and AoA. Dotted lines represent translated planes (1mm step) on both sides of the 3-ch