AUTOMATED QUANTITATIVE MODELING OF THE AORTIC VALVE AND ROOT IN AORTIC REGURGITATION USING VOLUME 3-D TRANSSESOPHAGEAL ECHOCARDIOGRAPHY

ACC Oral Contributions
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Background: In this study we applied a previously validated approach to automatically model and quantify the aortic valve (AV) and the root from 3-D TEE data in patients with aortic regurgitation (AR).

Methods: Volume 3-D TEE of the AV and proximal root from 15 patients with AR was analyzed using prototype Auto Valve Analysis ver 8 (AVA) (Siemens Ultrasound, Mountain View, CA). The conventional measures were compared to 2-D, and the non-conventional measures were compared to known normal database.

Results: (mean±SD) Conventional measures- 2-D and the AVA derived measures of AV area (r=0.98), STJ diameter (r=0.73) and SV diameter (r=0.79) showed good correlation; annular diameter was discordant (r=0.58) consistent with its complex geometry in AR. Non-conventional measures (abnormal vs. normal, mm) by AVA - Inter-commissural distance (mm) was increased (Left: 25.9±3 vs. 25, Right: 27.1±3 vs. 25.9 and Non: 27.2±3 vs. 25.5), Annulus to coronary ostia distance (mm) was increased (Right: 19.3±3 vs. 17.2±3 and Left 16.9±3 vs. 14.4±3); also, leaflet tip to ostia minimum distance was 5±1.6 (R) and 8±1.2 (L). The directly measured 3-D ERO in mild AR was 10-20mm2 and moderate AR was 30mm2. Figure shows an example of the automatically modeled and quantified AV and the root in moderate AR.

Conclusion: Automated quantification of the aortic valve and the root yields vital and incremental measures which may be valuable to guide surgical and percutaneous interventions to improve outcomes.