



ANATOMICAL CLASSIFICATION OF MITRAL VALVE PROLAPSE USING VOLUMETRIC ANALYSIS OF REAL-TIME THREE-DIMENSIONAL ECHOCARDIOGRAPHIC IMAGES

ACC Poster Contributions

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Authors: *Sonal Chandra, Ivan S. Salgo, Lissa Sugeng, Wendy Tsang, Lynn Weinert, Victor Mor-Avi, Roberto M. Lang, University of Chicago Medical Center, Chicago, IL, Philips Healthcare, Andover, MA*

Background: Pre-surgical planning of mitral valve (MV) repair in patients with Barlow disease (BD) and fibroelastic deficiency (FED) is difficult due to current inability to quantify MV geometry. We hypothesized that MV apparatus in degenerative MV disease could be quantified using volumetric analysis of Real Time 3 Dimensional transesophageal (TEE) images.

Methods: 54 patients underwent TEE study: 34 patients studied intra-operatively (16 BD, 18 FED classified surgically) and 20 normal controls (NL). MV parameters including annulus, leaflets and prolapse height and volume were analyzed using MVQ software (Philips).

Results: Volumetric quantification revealed distinct differences in MV parameters between NL, FED and BD. The degenerative MV patients had a larger annular area, leaflet area, prolapsed height and volume ($p < 0.05$) distinguishing them from NL controls (figure). Within degenerative MV patients, the increased prolapse height and volume measurements clearly separated BD from FED patients ($p < 0.05$). Of note, BD patients had a more circular than ellipsoidal MV annular shape (commissural to anterior-posterior diameter ratio closer to 1) compared to FED and NL controls ($p < 0.05$).

Conclusions: Volumetric quantification of MV prolapse is feasible and these parameters, particularly prolapsed volume and height, improve the ability to classify the etiology of MV prolapse, and thus differentiate between these patients while highlighting the complexity of geometric distortion in MV prolapse.

