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UTILITY OF 3-DIMENSIONAL ECHOCARDIOGRAPHY IN PREDICTING THE IMMEDIATE OUTCOME OF PERCUTANEOUS TRANSVENOUS MITRAL COMMISSUROTOMY

ACC Poster Contributions

Ernest N. Morial Convention Center, Hall F

Sunday, April 03, 2011, 3:30 p.m.-4:45 p.m.

Session Title: Echocardiography: 3-D, TEE, and Intracardiac Echo

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Background: Despite over 2 decades of percutaneous transvenous mitral commissurotomy (PTMC), the prediction of success/complications remains imperfect. We assessed the utility of 3-dimensional (3D) echocardiography parameters in predicting the immediate outcome of PTMC.

Methods: In a series of 48 patients (20 men and 28 women, mean age 26.7 ± 10.5 years, range 12 to 52 years) with severe mitral valve stenosis selected for PTMC, 3D transthoracic echocardiography was performed before and after PTMC. The mitral valve area was assessed by the various echocardiography methods pre- and post-PTMC, and the results were compared with those obtained invasively. The mitral valve volume, subvalvular deformity (SVD) volume, SVD length, mitral valve tent area, mitral valve excursion and 3D mitral annular diameters were measured. Intra- and inter-observer variability of these parameters were within acceptable limits.

Results: The mean mitral valve area at baseline, measured by 3-dimensional echocardiography was 0.69 ± 0.15 cm². The mean pre-PTMC valve area of 0.72 ± 0.22 cm² increased to 1.69 ± 0.37 cm² after PTMC as estimated by Gorlin's method. The pre-PTMC mitral valve area derived by 3D echocardiography, pressure half time, planimetry and Gorlin's method were all in close agreement to each other. Post PTMC the Gorlin's valve area was significantly related to pressure half time valve area ($p = 0.011$), while planimetry valve area and 3D valve area were not significantly related to Gorlin's derived valve area.

There were 4 failures (3 had grade 3 mitral regurgitation, 1 mitral valve area <1.5 cm²) and a total of 10 suboptimal results. A higher mitral valve volume (1.32 ± 0.68 ml Vs 0.99 ± 0.37 mL; $p = 0.021$), higher tent volume and more mitral valve excursion predicted the success of PTMC (1.67 ± 0.2 Vs 1.51 ± 0.2 cm, $p = 0.042$ in successful as compared to unsuccessful cases respectively).

Conclusions: Three-dimensional echocardiography complements two-dimensional echocardiography in assessing the mitral valve apparatus in rheumatic mitral stenosis and the quantitative 3-D parameters predict the immediate outcome of PTMC.