THREE-DIMENSIONAL ECHOCARDIOGRAPHIC PREDICTORS OF SUCCESSFUL BALLOON DILATION FOR CONGENITAL VALVAR AORTIC STENOSIS

Poster Contributions
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Background: Aortic valve Balloon Dilatation (AVBD) is the procedure of choice in children and adolescents with congenital aortic valve stenosis. Predictors for the success or failure of AVBD have not been well defined. We evaluated the 3 D (Three-dimensional) echocardiographic predictors of successful AVBD.

Methods: We studied 27 patients with a diagnosis of severe congenital aortic stenosis, aged 6 months - 21 years, who underwent AVBD at our institute. Routine 2D and 3D transthoracic echocardiography was done before AVBD. Morphological details of the aortic valve as seen on 3 D echocardiography were recorded including mobility, thickness, area of the cusps and calcification, if any. We calculated a leaflet score by addition of grades of calcium, mobility, and thickness. All patients underwent AVBD as per institutional protocol. A repeat echo including 3D echocardiography was performed within 24 hours of AVBD. Successful AVBD was defined as more than 50% reduction in peak gradient with final gradient < 40 mmHg in the absence of any complication including more than mild AR.

Results: AVBD could be performed in all 27 patients. Aortic valve orifice area increased from 0.67 ± 0.22 cm2 to 1.56 ± 0.36 cm2 with a fall in peak gradients from 97.2 ± 41.0 mmHg to 38.0 ± 18.3 mm of Hg. A total of 7 patients had unsuccessful procedure as defined by pre-specified criteria described above. Valves with restricted mobility and increased thickness had statistically significant chances of a failed procedure. Mean leaflet score in patients who had a successful AVBD was 3.80 ± 1.24 as compared to a mean leaflet score of 5.57 ± 0.78 in patients who had an unsuccessful AVBD (p = 0.002).

Conclusions: Good enface images of the aortic valves are possible with trans-thoracic 3D echocardiography and it complements 2D echocardiographic findings. Aortic leaflet score derived from morphological features like mobility, thickness, and calcium of the aortic cusps by 3 D echocardiography may be helpful in predicting the outcomes of AVBD. These findings need to be evaluated in larger studies.