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Results of transcatheter balloon aortic valvuloplasty in 59 neonates – one center experience

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OBJECTIVES: the aim of this study was to evaluate the results of transcatheter balloon aortic valvuloplasty (BAV) performed in neonates with critical aortic valve stenosis (AS).

BACKGROUND: aortic valve function and reinterventions after BAV in neonates are not well characterized.

METHODS: from 90 neonates with critical AS who underwent BAV in our center in period 1996-2006, 59 pts are in continuous follow-up. Retrospective and prospective data collection of these pts was analyzed. All procedures were performed in general anesthesia through carotid artery cut down or femoral artery puncture at the median age 6,5 days (1–28). Diameter of balloon did not exceed the aortic valve ring diameter in any case.

Results: There was significant systolic gradient decrease ($p < 0.001$) pre versus post BAV (58.49±24,82 mmHg (25-150, med 55) vs 15.81±11,03 mm Hg (0-45, med.15). Acute post-dilation aortic regurgitation was severe in 3/59 pts (5%).

The median follow-up period was 8 years (3-16.5); cumulative follow-up 536 patient-years. During follow-up systolic gradient increased significantly to 30,24±11,53 mmHg (9-57, med. 31), mean systolic gradient to 17.9±11.2 (3-62, med.15). Group of pts with severe aortic regurgitation increased to 18/59 pts (30%).

During follow-up median z-score of aortic valve annulus increased from 0.4 (-2.4-2.84) to 1.02 (-1.16-3.79) ($p < 0.01$). Ascending aorta diameter increased significantly (median z-score before 1.82 (-1.63-5.5), after 3.46 (1.15-8.29) ($p < 0.01$).

Nine pts (15.3%) median age 8,75 yrs (0.33-13.08) had surgical intervention for aortic valve (aortic valve repair -2, aortic valve replacement -7), 3 pts additional balloon valvuloplasty. Freedom from aortic valve interventions was 47/59 pts (79,66%).

CONCLUSIONS: 1. Transcatheter aortic balloon valvuloplasty is effective for relief of congenital aortic valve stenosis in neonates.

2. Continuous follow-up of patients after balloon aortic valvuloplasty is required due to long-term hazards for surgical aortic valve reintervention and replacement.