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Influence of balloon size on aortic regurgitation in neonates undergoing Balloon Aortic Valvuloplasty - a retrospective study over an 11-year period

Krasemann T., Herman R., Hamidi L.

Department of Paediatric Cardiology, Evelina Children's Hospital, London, United Kingdom

Background: Transcatheter balloon aortic valvuloplasty has become the first-line treatment for critical or severe aortic stenosis in neonates in many centres. Aortic regurgitation following balloon aortic valvuloplasty remains a major concern. An optimal balloon size to aortic annulus ratio in order to minimise aortic regurgitation post-procedure, whilst relieving the obstruction, has not yet been identified.

Methods and Results: In this retrospective study, data regarding 29 neonates with critical or severe congenital aortic valve stenosis, who underwent balloon aortic valvuloplasty in the first 28 days of life, over an 11 year period, was evaluated. The balloon size used, ranged from 71 to 160% of the annulus size, with an average of 89%, based on the aortic annulus size as measured on angiography. The aortic regurgitation immediately following the procedure was trivial in 8 (27.6%), mild in 13 (44.8%), moderate in 7 (24.1%) and severe in 1 (3.4%) patient. The balloon to annulus ratio had no statistically significant effect on the degree of aortic regurgitation immediately after the procedure (p value of 0.259), at first follow up within 6 weeks of the procedure (p value of 0.961) or at follow up at 1 year (p value of 0.92).

Conclusion: This study did not show any significant relationship between the balloon to annulus ratio during interventional dilatation and the degree of aortic regurgitation following the procedure. A large multicentre prospective study, concentrating on the effect of the balloon size used, would be ideal.