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Single centre experience of Balloon Angioplasty of Branch Pulmonary Artery Stenosis after Arterial Switch Operation

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Introduction: Branch pulmonary artery (PA) stenosis is a well recognised complication after arterial switch procedure. Balloon angioplasty of the residual lesions is well established. We aim to evaluate the safety and efficacy of the procedure in our centre, from 2004 to 2011.

Methods: We have retrospectively identified all patients who had branch PA dilatation after arterial switch operation. Seventeen procedures were performed in fourteen patients. Two patients were excluded due to associated supra-valvar pulmonary stenosis. Patient characteristics and haemodynamic data, including right ventricular (RV) and systemic arterial pressure, RV to systemic pressure ratio, pullback gradient across the branch PA stenosis and angiographic measurements, were analysed. Student's paired t test was used and a P value of <0.05 was considered statistically significant.

Results: Fourteen patients underwent a total of 15 procedures. The median age was 4 years (5 months- 16 years) and median weight 16.4kg (6-61.1). In 11 out of 15 interventions the RV to systemic pressure ratio remained unchanged. In the remaining 4 the change was not statistically significant (p 0.10). There was no change in the pullback gradient in 9 procedures. In the remaining 6, the gradient was reduced from a mean of 26 to 21mmHg (p 0.0211). Mild angiographic improvement was noted in 4 patients but there was no statistical significance (p 0.13). Two of the failed dilatations underwent successful stent placements during the same procedure and showed good immediate results. There was more than 50% reduction in pullback gradient and the RV to systemic pressure ratio dropped from 66% to less than 50%. There were no complications.

Conclusion: We have demonstrated that even though balloon angioplasty of branch PAs post arterial switch procedure is safe, it is not effective in the majority of patients. We are of the opinion that PA stenting should be the primary procedure in this group of patients, especially with the development of the latest stents which can be expanded to adult size.