

Growth of the Right Ventricle following an Aggressive Approach to Catheter Valvotomy in Pulmonary Atresia with Intact Ventricular Septum

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Introduction

Catheter valvotomy of the pulmonary valve is now accepted as a common procedure for pulmonary atresia with intact ventricular septum (PAIVS). Since performing the first valve perforation in 1990, our centre has taken a relatively aggressive approach towards catheter valvotomy, performing the procedure in infants even with a very small right ventricle in an effort to establish forward flow and promote growth of the ventricle. We present the results of such an approach.

Methods

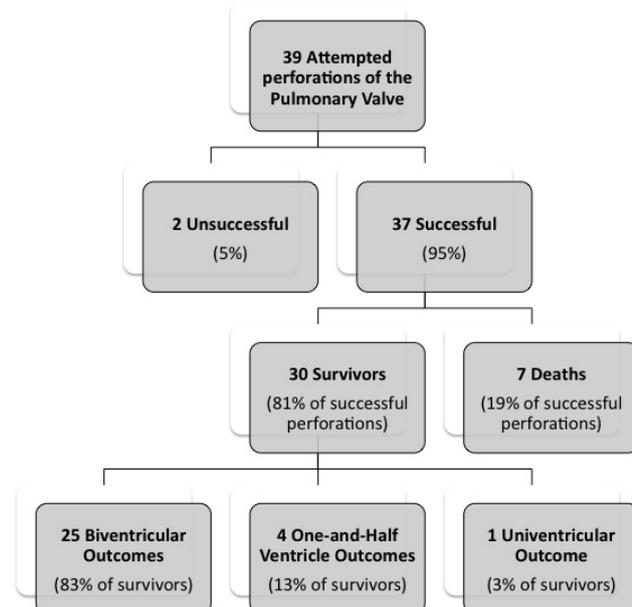
39 infants underwent the procedure between 1990 and 2009, 37 successfully. The baseline patient characteristics were identified from the clinical notes and retrospective analysis of the initial echocardiograms. Long-term outcome was analysed at a median of 8.1 years (range 1-20 years) and included the current circulatory status and size of the tricuspid valve (TV). All available echocardiograms were reviewed, with a total of 141 sets of measurements obtained.

Results

There were seven (17%) deaths during the initial 35 days following successful valvotomy, and no late deaths occurred. Median initial TV z-score was -4.4 (range +2.2 to -15.0). At last follow-up, 25 (83%) of the survivors had a biventricular circulation, four (13%) a one-and-half ventricle circulation and one (3%) a Fontan circulation.

Mean final saturations in subjects with and without biventricular circulation were 95.4 (± 3.9)% and 95.2 (± 1.1)% respectively.

Final TV z-score of patients achieving a biventricular outcome increased significantly (-4.4 (± 1.7) to -3.0 (± 2.0), $p=0.02$). TV z-score of those not achieving a biventricular outcome decreased significantly (-6.6 (± 1.8) to -10.1 (± 2.5), $p=0.02$).



Conclusions

This is the longest follow-up to date of survivors of this procedure, and there have been no late deaths. When there is no contraindication, extremely small right ventricles with small tricuspid valve diameters may be amenable to the procedure. With established forward flow, growth of the right ventricle may be achieved in some patients leading to a biventricular outcome.