

Benefits of Stenting the Arterial Duct following Catheter Valvotomy for Pulmonary Atresia with Intact Ventricular Septum

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Introduction

Catheter valvotomy is commonly accepted as the intervention of choice in neonates with pulmonary atresia with intact ventricular septum (PAIVS) and suitable anatomy. Following successful valve perforation, the greatest concern is whether the right ventricle can support the entire pulmonary flow. Therefore, in most cases, a prostaglandin infusion is continued or a Blalock-Taussig shunt (BTS) is inserted following the valve perforation. However, in our centre the arterial duct is frequently stented at the initial procedure. There are no data on the long-term outcome of this approach.

Methods

37 successful valve perforations were performed between 1990-2009. The arterial duct was stented in 17 (46%) patients. Stenting was performed at the initial valvotomy procedure in 14 patients, and at a later procedure in three patients. Stenting was generally performed in those with a smaller right ventricle. Median follow-up is 8.1 years (range 1-20 years).

Results

Results are illustrated in table 1.

There were two (13%) deaths in the stented group, one of which was partially attributed to overcirculation. There were five (25%) deaths in the unstented group. Necrotising enterocolitis (NEC) was less frequent in the stented group. One ductal stent required catheter occlusion at age four years; the remaining ductal stents occluded spontaneously. No other late complications of stenting were identified. It should be noted that the era in which the procedure was performed is a confounding factor.

	Stented	Not Stented	P-value
Median Year of Procedure	2005 (Range 1992-2009)	1998 (Range 1990-2009)	0.003
Number of patients	17	20	
zTV¹	-5.11 (\pm 2.53)	-4.13 (\pm 2.92)	0.283
Days ICU	4.6 (\pm 2.9)	9.1 (\pm 8.0)	0.029
Days in Hospital	17.4 (\pm 18.1)	33.8 (\pm 28.6)	0.012
NEC	2 (12%)	6 (30%)	0.246
Early Reintervention²	0	7 (35%)	0.009
Biventricular Outcome	11 (65%)	14 (70%)	0.920
Death	2 (12%)	5 (25%)	0.321

Table 1. ¹ zTV: tricuspid valve z-score (Daubeney algorithm) ² Early reintervention: classified as reintervention <100days post procedure

Conclusions

This retrospective analysis suggests that stenting of the arterial duct is an alternative to prolonged prostaglandin infusion or creation of a BTS following catheter valvotomy for PAIVS. Stenting may reduce intensive care stay and the rate of re-intervention.