Early and Mid-Term Outcomes of Transcatheter Management in Pulmonary Atresia with Intact Ventricular Septum

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Introduction:

Pulmonary atresia with Intact ventricular septum (PAIVS) is revealed with broad spectrum of heterogeneous morphology. Perforation of the atretic valve, balloon dilatation and stenting of the patent ductus arteriosus are the percutaneous techniques which are used with increasing frequency also in our clinic.They have some advantages over surgery including short hospital stay, short ICU stay etc. The main goal of the primary interventional approach is to avoid surgery. However, a group of patient with PAIVS still need to surgery because of the poor right ventricular growth. Therefore, the final achievement of the initial percutaneous treatment strategies is still debatable. In this paper, we present the early and mid-term results of the percutaneous approach in our clinic in order to investigate the final effect of interventional therapy according to initial morphology.

Methods:

Between May 2010 and November 2011, seventeen neonates underwent transcatheter intervention. Detailed echocardiographic examination based on RV size, tricuspid valve morphology and coronary sinusoids were applied to all patients before the intervention. Nine of the patients were boys and 8 were girls. The mean age was 12.7 ± 12.1 days and weight was 3.2 ± 0.9 kg. Table 1 summarizes the patients characteristics and preinterventional echocardiographic findings.

Results:

Two procedure-related mortalities occurred. The mean follow-up period was 6.9 ± 5.2 months (2-19 months).The mean duration of intensive care was 2 ± 1, 8 days. One of the patients with PAIVS achieved biventricular physiology after pulmonary valve perforation. Three patients have been followed without any reintervention or surgery.

Fourteen out of 17 patients achieved stent patency during 6 months of follow-up, while re-stenosis developed in one patient (1/13; %7.7) who had underwent Glenn operation at 5 months of age. Seven patients are still waiting for Glenn anastomosis without complication and reintervention (Table 2).

Conclusion:

As a primary treatment, transcatheter management for PAIVS is a feasible, safe, and effective palliation in newborns. Right ventricular size determines the type of the intervention. The early outcomes can be comparable with surgical palliation. However, a group of PAIVS particularly with severe right ventricular hypoplasia cannot achieve a surgery free life even after successful primary percutaneous intervention.

Table-1

Patient Data	
Age (day)	12.7±12.1
Gender(M/F)	9/8
Weight (kg)	3.2±0.9 (2.2-4.7)
RV Size	
Monopartiate	3
Bipartiate	11
Tripartiate	3
Coronary sinusoid (absent/present)	7/10
Ebstein malformation (absent/present)	15/2

Table-2

Patient Data	Median(range)
Days of Intensive Care stay	2.54 ± 3.3 (1-11)
Days of hospital stay	7.2±4.2 (3-23)
Balloon dilatation+PDA stenting	5
RF assisted Valvotomy	3
RF+PDA stenting	6
PDA Stenting	3
Pulse oxymetry saturation	
Before procedure	70± 6.14 (60-80)
After procedure	89.27±4.61(80-96)
Early /Late death	2 (%12) / 3(%18)