PERCUTANEOUS BALLOON VALVULOPLASTY FOR SEVERE PULMONARY STENOSIS IN INFANTS: A 10-YEAR INSTITUTIONAL EXPERIENCE AND LONGTERM OUTCOME

Fang Liu / Xuecun Liang / Lin Wu / Lan He / Lu Zhao / Pengjun Zhao / Guo-Ying Huang
Pediatric Heart Center, Children's Hospital of Fudan University, Shanghai, China

BACKGROUND

Although percutaneous balloon pulmonary valvuloplasty (PBPV) is the primary treatment for significant pulmonary valvular stenosis, it's widely considered to be difficult and relatively high risk for younger and severe stenosis children.

OBJECTIVE

We retrospectively reviewed and analyzed the immediate and long-term outcome and safety of PBPV in neonates and infants with severe or critical valvular pulmonary stenosis.

METHODS

One hundred and nine patients aged 2d~3y with critical or severe pulmonary valve stenosis admitted to our hospital from January 2005 to December 2014 underwent balloon valvuloplasty. Among them, 21 neonates had critical pulmonary stenosis, who had a tripartite right ventricle with moderate to severe tricuspid regurgitation (TR). Severe TR was seen in 12 and moderate TR in 6 out of other 88 patients of over one month of age. Right ventricular systolic pressure in all patients was equal to or greater than systemic pressure. 53 patients had PFO or small ASD with right-to-left or bi-directional shunt, 10 patients had PDA, 1 patient had multiple small muscular ventricular septal defects, and 1 patient had atrial septal defect, who had undergone the ASD occlusion two-year later. Dilatation with 2 balloons sequentially in one procedure was performed in 12 patients and dilatation with 1 balloon in the other patients.

RESULTS

The pulmonary valvuloplasty was successfully performed in 105 of the 109 patients, and the dilatation success rate was 96.3%. In the four failure patients, balloon catheter could not be manipulated to cross the pulmonary valve in three patients, cardiac tamponade occurred in one patient. Immediately after dilatation, the systemic pressure gradient from right ventricle to pulmonary artery decreased from 50~132 (76.25±23.7) mmHg to 4~96 (25.29±19.2) mmHg (P<0.001). No significant complications in all patients during or post dilation except cardiac tamponade in one. During a 12 months to 9.6 years follow-up (mean 5.01 years), data showed that: (1) pressure gradient crossing pulmonary valve measured by echocardiography further decreased or remained stable in 103 cases, except one neonate and three infants, whose pressure gradient gradually increased, and needed a second dilatation and good results were gained. Re-dilatation rate was 3.73% (4/107). No case needed further surgery; (2) Tricuspid regurgitation reduced in all patients except for three whose RV were dysplasia; (3) Mild pulmonary regurgitation was seen in most patients post-dilatation, except moderate in six and severe in one. (4) All 10 PDAs closed spontaneously in 3~6 months of follow-up and muscular VSDs were closed as well in 3 months of follow-up. (5) All patients were doing well and were asymptomatic and acyanosis.
CONCLUSIONS

Balloon pulmonary valvuloplasty (BPV) is safe and effective in attaining both immediate and long term reduction of pulmonary valvular gradients and is currently the preferred therapeutic modality for valvular PS even in small baby patients with severe or critical stenosis.