

Ductus arteriosus stenting in patients with ductal-dependent pulmonary blood flow- single center experience

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Background

Ductus arteriosus stenting has become an alternative, less invasive management option to Blalock-Taussig (BT) shunt implantation in selected patients with ductal-dependent pulmonary blood flow. The aim of this study was to assess safety, feasibility, short- and mid-term follow up and complications associated with this intervention.

Methods

Between August 2013 and July 2017 34 patients (one patient twice) with ductal-dependent pulmonary blood flow underwent cardiac catheterization for ductus arteriosus stenting as a first step management. Diagnoses: pulmonary atresia (PA) with a ventricular septal defect (n=5), PA with an intact ventricular septum (n=7), critical pulmonary stenosis (PS) with a double-outlet right ventricle (n=5), critical PS (n=3), Tetralogy of Fallot (n=2), transposition of the great arteries (n=1) and complex heart defect with ductal-dependent pulmonary circulation (n=11). The median age of the patients was 10 days (min.1; max.1840) and median weight was 3 kg (min.1.7;max.13,6). Premounted coronary stents CoroFlex Blue (diameter:3-4mm; n=33) and Formula 414 stents (diameter:6mm; n=1) were used to cover whole length of the ductus arteriosus. In 17 cases the intervention was performed from the femoral access (femoral artery=15,femoral vein=2), in 18 from the axillary access.

Results

Access and stenting for the ductus arteriosus were successful in 29 patients (85%). In follow up, ductus restenting was required in one patient. Complications occurred in 6 interventions (17%) (stent dislocation n=2; not covering whole ductus length n=2; stent dislocation over balloon n=1, arteriovenous fistula n=1) and 5 of these patients needed surgical BT shunt placement. After successful ductus stenting the median time between intervention and next-step surgery was 86 days (n=18; min. 48; max.431). In re-catheterization (usually performed before surgery) median Z-score value of the LPA and RPA diameter (n=22) increased from -0,87 (min.-2,86;max.1,81) and -0,28 (min.-1,69;max.1,39) to 1.37 (min.-3.14;max.3.55; p<0.001) and 0.95 (min.-0.91;max.3.67; p<0.001), respectively.

Conclusion

Stenting of the ductus arteriosus is an appropriate alternative to surgical shunt interposition in many patients with ductal-dependent circulation. It provides satisfactory pulmonary arterial growth and enables to postpone surgical treatment. However in some patients procedural complications may occur and surgical shunt placement is needed.