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Stenting of branch pulmonary artery stenosis after surgical correction in children under 14 kg

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Background & Purpose: In infants and young children with congenital heart disease, post-operative branch pulmonary artery stenosis is a major cause of morbidity and mortality. While angioplasty is a standard treatment option, high rates of restenosis is reported. We report our experience of using stents to treat branch pulmonary artery stenosis in small children (<14 kg).

Materials & Methods: From November 2014 to December 2016, percutaneous stent implantation was performed in 15 small children (10 males and 5 females) with mean weight of 9.6±3.3 kg (2.2 kg-13.9 kg), mean age 2.2±1.5 years (1.5 month-5 years). Stents used included the Valeo Vascular stent, Palmaz Genesis XD, and genesis stent pre-mounted on OPTA PRO via 6 Fr-8 Fr Cook sheath. One patient had a left pulmonary artery occlusion; other 14 patients had pulmonary artery ostial and proximal stenosis after cardiac surgery.

Results: Interventional correction was successful for all 15 patients. Valeo Vascular stents were implanted in 10 patients, Palmaz Genesis XD stents in 4, and Genesis stent pre-mounted on OPTA PRO in 1. One patient required a second stent due to residual ostial stenosis. The minimum diameter post stent increased from 2.6±1.3 mm to 7.5±1.4 mm. Mean right ventricular to pulmonary artery gradient decreased from 62±10.4 mm Hg to 19±4.3 mm Hg. Five infants who required mechanical ventilation prior to stenting was successfully weaned off in 1-3 days.

Conclusion: Stent treatment of post-operative branch pulmonary artery stenosis in children under 14 kg is safe and effective, and may shorten mechanical ventilation support post operatively.

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Congenital heart disease and impact on child development

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Objectives: To evaluate the child development and evaluate a possible association with the commitment by bio-psychosocial factors of children with congenital heart disease and those without the infection.

Methods: This research is an observational case-control study comparing the development of children with and without heart disease, categorized in three groups. Group 1(G1): children 0-10years of age both male and female genders with congenital heart disease awaiting surgery; Group 2 (G2): children of age 0-10years of both genders who have undergone at least one surgical procedure for congenital heart disease correction between 6 months and 1 year before the application of the instruments of this study; Group 3 (G3): Children 0-10 years, healthy and both genders. As instruments, we used a bio- psychosocial data questionnaire that includes social, demographic, psychological and clinical factors, and a development screen test divided into four fields of functions i.e. personal-social, fine-motor-adaptive, language and gross motor.

Results: Ninety six children were evaluated, 19 (22.66%) belonging to the G1 (preoperative children with heart disease), 32 (33.59%) in Group 2 (postoperative children with heart disease) and 45 (43.75%) in G3 (healthy children). Of the total, 55.56% are girls and age ranged from 2 months to 10 years. The children with heart disease had more suspicious and abnormal ratings and in the group of healthy children 53.6% were considered with normal development ($P \leq 0.0001$). The biopsychosocial variables that were related to a possible developmental delay were gender ($P=0.042$), child's age ($P=0.001$) and income per capita ($P=0.019$).

Conclusion: The results suggest that children with congenital heart disease are likely to have a developmental delay with significant difference between children who have undergone surgery and those awaiting surgery under clinical follow-up.

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