Coronary Stent Implantation in Critical Aortic Coarctation as Bridging Therapy to Surgery in Very Low Birth Weight Infants

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Introduction Surgical treatment of critical aortic coarctation (CoA) is extremely difficult in very low birth weight (VLBW) newborns and is usually postponed until at least 2 kg of weight. Sometimes earlier treatment is warranted due to brachiocephalic hypertension, systemic underperfusion or pulmonary overflow. Surgery remains a high-risk option at this weight when prostaglandin infusion had to be discontinued.

Objectives To review the results of primary interventional coronary stent implantation as bridging therapy to surgery in VLBW newborns with CoA.

Methods Clinical, echocardiographic, catheterization, surgical and neurodevelopmental data were retrospectively reviewed of all VLBW newborns who underwent primary stent implantation.

Results Between 2010 and 2015, 5 VLBW neonates underwent primary stent implantation. In all children initial treatment with prostaglandin was discontinued due to severe side effects and/or ineffectiveness. Median age and weight at intervention were 14 days (range 12-16) and 1200 gram (680-1500) respectively. Median invasive gradient was 42.5 mmHg (40-45) before and 2 mmHg (0-10) after stenting. Coronary stent diameter ranged from 3 to 5 millimeter. The femoral artery used for intervention was occluded in 4/5 infants without clinical compromise. There were no other procedural complications. In one infant early restenosis and severe aneurysm occurred 2 months after stenting and was treated with covered coronary stents. To date 4/5 children received surgical correction at a median age of 189 days (111-130) and weight of 5400 gram (4500-6800). No reinterventions were indicated during a median postoperative follow-up of 821 days (186-1622). Neurodevelopmental outcome was unremarkable in all patients. Median Griffiths scores were normal and comparable between patients and their siblings (4/5 patients were gemelli), 89.5 (80-102) and 88 (81-107) respectively.

Conclusions Coronary stent implantation is a feasible bridging therapy to surgical repair in VLBW newborns with CoA in whom prostaglandin therapy fails.