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Neonatal Ross-Konno Procedure after Fetal Aortic Valve Dilatation

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Objectives: Fetal aortic valve intervention can induce left ventricular functional improvement and growth of left sided cardiac structures in patients with critical aortic stenosis. A neonatal Ross-Konno procedure might be necessary to offer relentless relief of left ventricular outflow tract obstruction and enable a biventricular pathway.
Methods: Our single center retrospective study includes 15 patients who underwent a neonatal Ross-Konno operation after fetal aortic valve intervention between 2005 and 2017. Intervention was performed between the 26th and 34th week of gestation under the following criteria: dilated left ventricle with severely impaired function (FS < 15%) and signs of EFE; LV long-axis z-score > -1 or > 0 depending on gestational age; left to right shunt across the foramen ovale and a reverse flow in the aortic arch. Neonatal Ross-Konno was done enlarging the LVOT with a pericardial patch and doing a concomitant aortic arch repair in 5 patients. Age at operation was between 5 and 19 days, weight ranged between 2,18 and 3,9 kg.
Results: Mitral valve diameter z-score ranged between -0,62 and -3,85, mitral valve abnormalities were described in 9 pts., 8 children had EFE grade III, 6 underwent an EFE resection. 8 pts. had a preoperative FS ≤ 20%. The median discriminant score was -2,43. Three pts. needed postoperative ECMO. In hospital mortality was 6,7% (1 pt. due to NEC on pod 37). One patient underwent a take-down procedure at the age of 5 months due to chronic CHF and died 5 months later after BDG.
Left ventricular function is considered good or excellent in 11 pts. and moderately reduced without PHT in 2 pts. at last FU. Autograft function is good in all pts. without reoperation during the FU of up to 12,3 a. 2 children needed reoperations for mitral valve surgery, one required a pacemaker.
Conclusions: The neonatal Ross-Konno procedure can offer successful biventricular repair even in children with severe long lasting LVOT obstruction, who probably would not have become biventricular without fetal aortic valve dilatation. The absence of LVOT reoperation indicates a long lasting form of repair.