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Right ventricular outflow tract reconstruction without conduit in neonates with tetralogy of Fallot: comparison of pulmonary stenosis vs. pulmonary atresia

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Introduction: Early primary repair has been applied in tetralogy of Fallot with pulmonary atresia and well-developed central pulmonary arteries supplied by a ductus arteriousus (TOF/PA). A valve conduit for the right ventricular outflow tract (RVOT) reconstruction is extensively used in this group of neonates. Its use is considered as contributing factor to lower freedom from reintervention comparing to neonatal repair of tetralogy of Fallot with pulmonary stenosis (TOF/PS). Since 1997 our institutional approach was to perform primary RVOT reconstruction in TOF/PA with avoidance of conduit placement. We sought to determine early and long-term results of this strategy for TOF/PA and compared them with results of neonatal transannular patch repair in TOF/PS.

Methods: This is a retrospective review of 21 neonates with TOF undergoing RVOT reconstruction without use of conduit at a single centre between 1997 and 2013. Nine TOF/PS and 8 TOF/PA patients underwent transannular patch repair and 4 TOF/PA neonates without continuity between main pulmonary trunk and right ventricle received direct anastomosis of RVOT to main pulmonary artery supported by pericardial patch. During the same period, in 2 neonates with TOF/PA the primary conduit placement was needed.

Results: The mean age at primary repair was 17.5 $\pm$ 7 days for TOF/PS and 10.4 $\pm$ 6 days for TOF/PA (p=0.025). The hospital survival was 100% for both analyzed groups. Early postoperative course was comparable in both groups according to duration of mechanical ventilation (96 vs. 84 hours; p=0.9), maximum vasoactive-inotropic score (10 vs. 9; p=0.78), intensive care unit stay (6 vs. 7 days; p=0.85) and hospital stay (11 vs.14 days; p=0.61). One patient with TOF/PA died during follow-up. Overall freedom from RVOT reintervention during median follow-up of 9 years (0.3-16.3) was 77.8% in TOF/PS and 72.7% in TOF/PA group (p=0.79). There was no difference in right ventricular end-diastolic dimension, tricuspid regurgitation, QRS duration and gradient across RVOT at 1, 5 and 10 years.

Conclusions: In our limited experience, RVOT reconstruction with avoidance of conduit placement can be safely accomplished in majority of neonates with TOF/PA. RVOT reintervention rate during follow-up is comparable to TOF/PS after neonatal transannular patch.