Long-term effects of residual right ventricular (RV) outflow tract obstruction on RV dimension and function in patients after repair of tetralogy of Fallot

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Objectives: Preservation of the pulmonary valve, even at the expense of a mild residual stenosis, is the current surgical policy in the management of patients with tetralogy of Fallot (TOF). The purpose of this study was to assess the long-term effect of a residual right ventricular outflow tract obstruction (RVOTO) on RV dimension and function.

Methods: From April 2007 to December 2011, fifty-three children (mean age 13.4 ± 6.4 years) after repair of TOF (mean age at surgery 1.3 ± 1.3 years) were prospectively assessed by cardiovascular magnetic resonance imaging (3-T MR scanner, Siemens, Erlangen, Germany). Residual RVOTO on echocardiography was defined as a peak systolic RVOT gradient ≥ 25 mmHg.

Results: Patients with RVOTO (n = 29; mean gradient 39.5 ± 11.9 mmHg) had significant less pulmonary regurgitation (PR) (25.2 ± 10.6 % vs. 30.8 ± 9.3 %; p < 0.05) compared to patients without RVOTO (n = 24; mean gradient 15.4 ± 7.0 mmHg). Children with RVOTO had significant smaller RV enddiastolic (94.0 ± 2.6 ml/m2 vs. 104.0 ± 20.7 ml/m2; p < 0.05) and endsystolic (42.9 ± 20.0 ml/m2 vs. 48.9 ± 13.2 ml/m2; p < 0.05) volumes compared to patients without RVOTO, while RV ejection fraction did not differ between the two groups (EF 55.5 ± 8.4 % vs. 54.0 ± 6.6 %; p = n.s.). Restrictive physiology, assessed by late diastolic forward flow in the main pulmonary artery, was equally distributed within both groups (31% vs. 25%; p = n.s.).

Conclusions: According to our data, residual RVOTO after repair of TOF does not affect RV function, while RV dimensions and the degree of PR are more favourable in the long-term follow-up of those patients. These results confirm the beneficial effects of the current strategy in repair of TOF.