

P2-105

Restrictive enlargement of pulmonary annulus at surgical repair of tetralogy of Fallot: 10 year Follow Up study

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Objectives: Since 1996 our center follows a uniform strategy of restrictive enlargement of the pulmonary annulus at surgical repair of tetralogy of Fallot (ToF). A transannular patch (TAP) is only used if the z score of the pulmonary annulus (PV) is < -4 . The rate of TAP was significantly reduced accepting a significantly smaller PV. Whether this strategy leads to reduction of pulmonary insufficiency (PI) and re-operation rate in the long-term has not been studied.

Methods: 95 ToF patients who had their repair between 1996 and 2006 were included in the study. Clinical, echocardiographic, ECG and cardiac MRI data were collected. The cohort was compared to a historic cohort of 110 patients, who had their repair between 1975 and 1996.

Results: 6 patients were lost to Follow Up. Follow Up since repair was 12.6 (5.9-19.4) years. 28 patients (31.4%) needed a TAP. Patients were in a good clinical condition (NYHA (1/2): 78/11) with a mean QRS of 130 ± 21 ms. On echocardiography all patients showed a mild pulmonary stenosis (PS) with a mean V_{max} 2.4 ± 0.63 m/s, while 38 % showed moderate or severe PI (PI (none/I°/II°/III°: 17/37/32/1). CMR derived volumes were: EDVi 110.4 ± 20.9 ml/m², ESVi 55.6 ± 15.8 ml/m² and EF 48.8 ± 12.1 %. 7 patients needed a re-operation for PS (7.9%) and 5 for PI (5.6%). In 3 patients the pulmonary valve had to be replaced (PVR) in the first re-operation, altogether 10 PVRs were performed in 5 patients. Freedom from re-operation of the PV was 89.3% at 10 years Follow Up. In the historic cohort (69 %TAP) significantly more patients needed a re-operation for PI (5/89 vs. 20/110, $p=0.005$).

Conclusion: The re-operation rate for pulmonary insufficiency is significantly lower in patients with a restrictive enlargement of the pulmonary annulus compared to a historic cohort. To proof whether this result holds true when compared to a cohort of patients operated in the same time period but without following a uniform strategy a control group from the Kompetenznetz Angeborene Herzfehler will be recruited.