

Influence of pulmonary valvulation in adults with Tetralogy of Fallot on left ventricular function

Gouton M., Bakloul M., Chalard A., Boussel L., Metton O., Henaine R., Ninet J., Bozio A., Di Filippo S. Hôpital Cardio-Vasculaire et Pneumologique Louis-Pradel, Lyon, France

The impact of pulmonary valvulation in adults with repaired Tetralogy of Fallot and significant pulmonary regurgitation on RV volume and function has widely been studied. However its influence on LV function is less clear. The aim of this study is to compare LV function prior and after pulmonary valvulation.

Material and Methods: Clinical status, physical ability (Max VO₂), ECG and 24h-ECG, echocardiography data including RV and LV diameters and systolic function, RMN when available, were analyzed before and after pulmonary valvulation in adults with surgically corrected Tetralogy of Fallot.

Results: 49 GUCH patients, who underwent repair of Tetralogy of Fallot from 1970 to 1999, were included in the study: 29 needed a previous palliative shunt, 38 had an infundibulo-transannular patch. Pulmonary valvulation was performed at a mean of 24 years after corrective surgery (mean age at initial surgery and at valvulation respectively: 5.5 and 29.4 y). Mean follow-up after valvulation was 1.5 y. No patient was lost to follow-up, no death occurred. Although NYHA status improved (from 1.9 to 1.1), physical ability did not changed with maximal power level of 120 Watts before and 125 Watts after valvulation (NS) and max VO₂ 20.8 versus 21.5 ml/min/kg (NS). ECG showed no difference in QRS duration (158 vs 155 ms), but 24h-ECG showed decrease in significant arrhythmias (atrial fibrillation or flutter, polymorph ventricular premature beats or ventricular tachycardia).

Echocardiographic records showed decreased RVEDD (41 vs 29 mm, $p < 0.0001$), increased LVEDD (43 vs 47 mm, $p = 0.001$) and increased LV shortening fraction (31 vs 36 %, $p = 0.01$). RMN analysis similarly demonstrated decreased RV volumes (diastolic 172 vs 94 ml/m², $p < 0.0001$ and systolic 113 vs 62 ml/m², $p = 0.01$) but unchanged RV ejection fraction, and increased LV diastolic volume (58 vs 67 ml/m², $p = 0.02$) and LV ejection fraction (55 vs 61 %, $p = 0.04$).

Conclusion: Pulmonary valvulation in Fallot patients with significant pulmonary regurgitation does not yield to improve objective physical ability, QRS duration, RV function, but contributes to ameliorate subjective physical status and has a favorable impact on RV volumes, LV function, and the occurrence of severe arrhythmias.