

Early Electrocardiographic Changes in Patients with Tetralogy of Fallot After Surgical Repair with Monocusp Pulmonary Valve

Ljung L. (1), Jeremiasen I. (1), Rosenkvist C.J. (1), Maxedius A. (1), Sjöberg G. (2), Hanseus K. (1), Liuba P. (1)

1) Cardiology, Pediatric Heart Center, Skåne University Hospital, Lund, Sweden

2) Pediatric Cardiology, Karolinska University Hospital Stockholm, Sweden

Background: Surgical repair of Tetralogy of Fallot (TOF) with right ventricular outflow tract (RVOT) enlargement with transannular patch (TAP) results in pulmonary regurgitation (PR) with subsequent increasing RV volume load and need for later pulmonary valve replacement. These changes are typically associated with progression of QRS and QTc duration, which are predictive for long-term adverse events. RVOT reconstruction with monocusp pulmonary valve has been increasingly used during the past decade in the attempt to improve early postoperative recovery and delay PR particularly during the first years after surgery.

Objective: To assess whether repair of TOF with monocusp pulmonary valve influences the progression of QRS and QTc duration during the first two years after surgical repair of TOF.

Methods: We performed a retrospective survey of all patients with TOF who underwent surgical repair between 1998-2014, who had conventional electrocardiograms available (A) before surgery, (B) upon postoperative discharge and (C) and at 18-24 months after surgery, and who did not require reoperation during this period. Demographic, clinical, surgical and electrocardiographic data were obtained. Data are median and range.

Results: In total, 93 patients who fulfilled the above criteria were included. There was no mortality. Of these, 34 patients (median age/weight at repair:4.8 months/6.9 kg) underwent pulmonary valve-sparing repair, 30 patients (median age/weight:5.2 months/6.7 kg) underwent TAP repair, and 29 patients (median age/weight:5.3 months/6.5 kg) had repair with TAP and monocusp. There were no differences between the groups in QRS and QTc durations preoperatively or upon discharge after repair ($p>0.15$). At 18-24 months, both QRS and QTc durations were greater in the monocusp group ($p<0.05$ for QRS and $p<0.01$ for QTc). The percentage change in QRS and QTc durations from the early postoperative time were increased in the monocusp group as compared to the other groups ($p<0.05$ for both).

Conclusion: Surgical repair of TOF with TAP and monocusp pulmonary valve appears to be associated with adverse changes in QRS and QTc durations during the first years after repair.