Adults after Arterial Switch Operation for Transposition of the Great Arteries: the role of complex anatomy

Jan Affolter[1], Francisco Javier Ruperti-Repilado[2*], Judith Bouchardy[3,4], Harald Gabriel [5], Simon F. Stämpfli[6], Reto Engel[7], Markus Schwerzmann[2], Matthias Greutmann[8], Daniel Tobler[1]*

1. Division of Cardiology, University Hospital of Basel, Basel, Switzerland

2. Center for Congenital Heart Disease, Cardiology, University Hospital Inselspital, University of Bern, Switzerland

3. Department of Cardiology and Cardiac Surgery, University Hospital Lausanne, Lausanne, Switzerland

4. Division of Cardiology, University Hospital Geneva, Geneva, Switzerland

5. Medical University of Vienna, Department of Cardiology, Adult Congenital Heart Disease Program, Vienna, Austria

6. Heart Centre Lucerne, Luzerner Kantonsspital, Lucerne, Switzerland

7. Department of Cardiology, Kantonsspital St Gallen, St Gallen, Switzerland

8. University Heart Center, Department of cardiology, University of Zurich, Switzerland

* These authors contributed equally to the study design, data interpretation, and manuscript preparation and are, therefore, first shared authors.

Corresponding author:

Daniel Tobler, MD
University Hospital Basel
Petersgraben 4
4031 Basel
daniel.tobler@usb.ch
+41 61 265 52 14

Abstract

Introduction: Adults after the arterial switch operation (ASO) for transposition of the great arteries (TGA) are an evolving novel cohort in adult cardiology clinics. The aim of this study is a better understanding of residual lesions in adulthood and complications during follow-up.

Methods: Adults after the ASO enrolled in the Swiss Adult Congenital Heart disease Registry (SACHER) were included. We analyzed demographic characteristics, cardiac function, cardiac anatomy, surgical and medical history, cardiac imaging, cardiovascular fitness, laboratory parameters and cardiac related interventions during follow-up. Baseline characteristics and outcomes were stratified between complex (with ventricular septal defect) and simple (with intact intraventricular septum) TGA.

Results: In total, 149 patients (99 simple TGA and 50 complex TGA; mean age 24 years; 71% male) were included in the analysis. At baseline, patients with complex TGA have had more interventions related to the left ventricular outflow tract (LVOT) (16% vs 3%, p=0.01)) and cardiac devices (10% vs 2%, p=0.03). Functional cardiac status was similar between groups with no difference in NYHA class. On the ECG, the QRS duration was longer in the complex group (106 [94-140] vs 96 [90-105] ms, p=0.001). Median follow-up was 27 (15-46) months. During follow-up, patients with complex TGA had more cardiac interventions compared to patients with simple TGA (7 (12%) vs 4 (4%), p=0.03). One patient with complex TGA died. A progression in QRS duration was observed during follow-up in both groups (∆median [ms] of 4, p=0.001 and 2, p=0.007 for simple and complex, respectively) whereas the other parameters of cardiac function remained unchanged.

Conclusion: Patients with complex TGA and prior ASO have more cardiac re-interventions in early adulthood compared to those with simple TGA. The role of QRS duration and the presence of concomitant LVOT obstructions needs to be further investigated in larger cohorts with longer follow-up.

Key words: Transposition of the great arteries, arterial switch operation