

### Clinical course long after atrial switch: a novel risk score for serious clinical events

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**Background:** Patients after atrial switch surgery for transposition of the great arteries (TGA-AtrSO) experience serious clinical events during adulthood, mainly heart failure and arrhythmias, but data on the emerging risks remain scarce.

**Purpose:** To assess the risk for events during the clinical course in adulthood of TGA-AtrSO patients and provide a novel risk score for event-free survival.

**Methods:** We reviewed medical records of TGA-AtrSO patients from five hospitals. Endpoints were all-cause mortality, heart failure (HF), defined as HF hospitalizations, heart transplantation, ventricular assist device implantation, or HF-related death, and symptomatic ventricular arrhythmias (VA). Predictors for event-free survival were examined to construct a prediction model using bootstrapping techniques.

**Results:** We followed 169 TGA-AtrSO patients (60% Mustard, age 28 [IQR 24–36] years) for 13 [IQR 9–16] years, during which 17 (10%) died, 34

(20%) had HF events, and 15 (9%) had VA events. Five-year risk of mortality, first HF event, and first VA increased from 1% each at age 25, to 7% (95% CI 4–10%), 17% (95% CI 10–25%), and 4% (95% CI 2–8%), respectively, at age 50. A prediction model combining age >30, prior VA, age >1 year at repair surgery, QRS duration >120ms, ≥mild LV dysfunction, and severe tricuspid regurgitation discriminated well between patients at low (<5%), medium (5–20%) and high (>20%) 5-year risk (optimism corrected C-statistic=0.84). Observed 5- and 10-year survival in low-risk patients were 100% and 99%, compared to only 45% and 19% in high-risk patients.

**Conclusion:** The clinical course of atrial switch patients increasingly consists of serious clinical events, especially heart failure. A novel risk score stratifying patients as low, medium, and high risk for event-free survival is presented, providing information on absolute individual risks which may support decisions for pharmacological and interventional management.

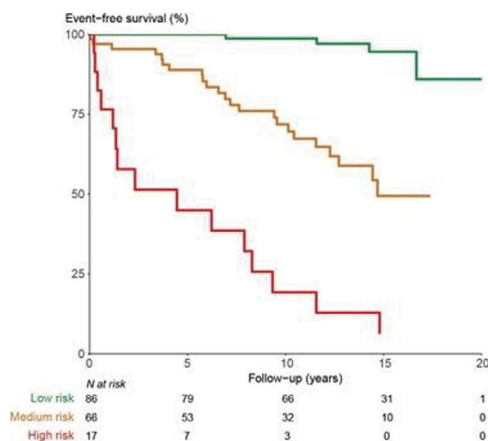


Figure 1. Observed event-free survival of patients with predicted low risk (<5% in 5 years), medium risk (5–20% in 5 years) and high risk (>20% in 5 years).