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Pronostic factors after arterial switch operation for transposition of the great arteries in children

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The objective of this study was to assess long-term outcome and factors associated with mortality in children after arterial switch operation (ASO) for transposition of the great arteries (TGA).

Material and methods : retrospective analysis of all ASO performed from 2000 to 2016 in patients with TGA. Demographics, clinical and biological data, surgical techniques, echocardiographic measurements, and outcomes were collected. Pronostic factors for mortality were assessed.

Results : 364 patients were included (263 males). Antenatal diagnosis was made in 60,4%. Birth weight was $3207,5 \pm 511,2$ g, gestational age was $39,1 \pm 1,6$ weeks. Intramural coronary artery was present in 24 cases (6.6%). Long term follow-up was $9,2 \pm 4,8$ years. Rashkind procedure was performed in 88.7% of the cases. Ventilatory support was needed in 56% and prostaglandins in 85% preoperatively. ASO occurred at the age of $7,44 \pm 6,26$ days (1 to 56) and $5,6 \pm 4,6$ days after admission. Bypass duration was $123,1 \pm 33,3$ mn. Overall and postoperative hospital stay were respectively $19,9 \pm 8,6$ and $14,4 \pm 7,3$ days. Survival rates were 95.3% at 1 month, 94.8% at 3, 6 and 12 months and 94.5% at 2.5 years and up to 18 years after surgery. Twenty patients died (5.5%): 17 early postoperatively (4.7%). Time from surgery to death was $64,2 \pm 207,9$ days (0 to 919). Long-term events occurred in 49.6% of the patients: pulmonary stenosis, aortic or mitral regurgitation, residual shunt, coronary lesions (1.7%), arrhythmias (5.5%), cardiac failure. Freedom from late reintervention was 99.7%, 97.4%, 96.2% at 1, 3 and 6 months, 95.9%, 95%, 92.3% and 90.3% at respectively 1, 2, 5 and beyond 8 years after ASO. No Rashkind, postoperative ECMO support, delayed chest closure, bypass duration, troponine level and small birth weight were significant predictive factors of mortality (respectively $p=0.006$, $p<0.0001$, $p=0.0007$, $p<0.0001$, $p=0.001$ and $p=0.044$). Antenatal diagnosis, gender, gestational age, preoperative ventilatory support, prostaglandin infusion, and SpO₂, coronary arteries anatomy or age at surgery were not associated with death.

Conclusion : This study showed that Rashkind procedure may have a favourable impact on prognosis of neonates with TGA. Postoperative ECMO support and troponine level, and small birth weight were associated with worse outcome.