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A 10-year experience with arterial switch operation in a single medium-volume institution: improving outcomes over the years

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BACKGROUND. Several factors have been identified as carrying additional risk in patients with transposition of great arteries (TGA) following arterial switch operation (ASO). Due to the evolving surgical strategies/perioperative management, the purpose was to analyse the outcomes and morbi-mortality trends at our institution.
PATIENTS/METHODS. Between 2006-2015, 115 ASO were performed [age 11+/-7 days (range 1-150); weight 3.2+/-0.3 kg (range 1.8-7.4)]. “Simple”-DTGA 59.1% (n=68); DTGA+CIV/DORV 30.4% (n=35); Taussig-Bing 8.7% (n=10); DTGA+partial AVSD 0.8% (n=1); DTGA+hypoplastic aortic arch 0.8% (n=1). Surgical era/impact of preoperative factors on early mortality and follow-up analysis were conducted.
RESULTS. Single-stage repair was performed (all patients). The coronary pattern was: normal (type A/D) (80.8%,n=93), single coronary artery (9.5%,n=11), intramural pattern (3.4%,n=4), inverted pattern (0.8%,n=1), single sinus pattern (2.6%,n=3), others (2.6%,n=3). Cardiopulmonary bypass time: 212.6+/-34.5 min (range 134-448). Aortic-cross-clamping time: 111.9+/-23.2 (range 55-270). Peri-/postoperative ECMO: 17 patients (14.7%). PICU stay: 18+/-4.5 days (range 5-179). Mechanical ventilation duration: 192+/-87.8 hours (range 48-1752). Delayed sternal closure: 62.6%. 30-day mortality: 13% (n=15) (causes: severe ventricular dysfunction and/or refractory hypoxemia). 30-day mortality was influenced by surgical era and factors showed in the table. In-hospital percutaneous procedures (6 in 5 patients, 4.3%): ballooning (neopulmonary/PA’s/neoaorta) (n=5), coarctation stenting (n=1). In-hospital reinterventions (8 in 5 patients, 4.3%): left coronary artery reconstruction (n=1), aortic/mitral repair (n=3), mitral replacement (n=2), LV-free-wall rupture repair (n=1), pacemaker implantation (n=1). Median in-hospital stay: 28.8+/-9.3 days (range 11-128). Median follow-up: 59.1+/-31.8 months (range 2-120). Overall survival (100 hospital survivors): 99%; one mortality case 3 months following ASO (severe biventricular dysfunction). Freedom from catheter-based interventions at 2, 5 and 8 years: 91%, 76% and 73% [ballooning/stent RVOT (n=12)]. Freedom from re-interventions at 1 and 5 years: 94% and 89% [RVOT/PA patching (n=4)]. Significative lesions (last follow-up): 13 patients: moderate aortic/pulmonary regurgitation (n=7), moderate PA’s stenosis (n=2), multiple VSD (n=2), moderate supravalvar pulmonary stenosis (n=1).
CONCLUSIONS. Early outcomes following ASO have improved in recent years. Older patients or those with associated lesions/abnormal coronary pattern may not be at increased risk of death at medium-volume institutions in the current era. Medium-term outcomes are excellent, but follow-up focused on right-sided lesions is needed.

Variables – 30-day mortality, n (%)	2006-2010	2011-2015	p
Age >21 days	2 (2.7)	0 (0)	0.04
Associated cardiac/great vessels lesions	5 (6.9)	2 (4.6)	0.038
Abnormal coronary pattern	4 (5.5)	0 (0)	0.0021