D-Transposition of the Great Arteries: single-center experience with arterial switch operation in the current era

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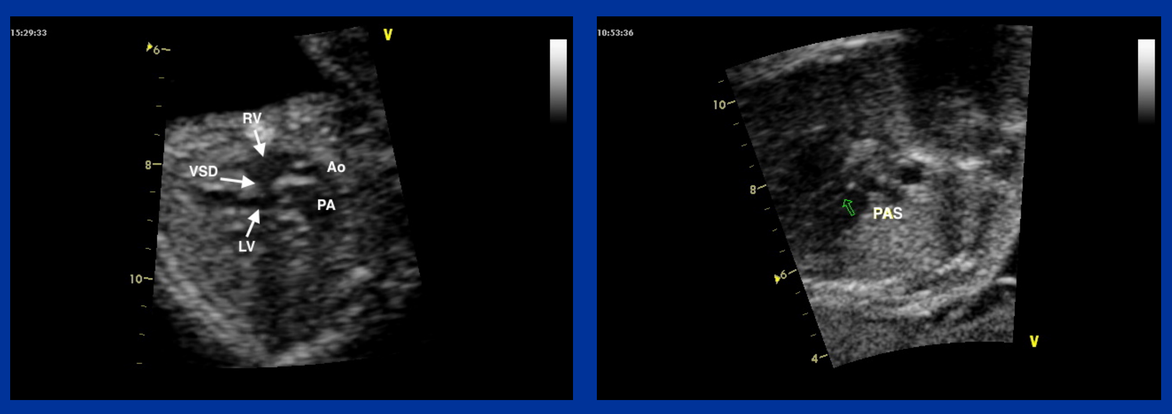
Introduction:
The neonatal arterial switch procedure has become the technique of choice for babies with transposition of the great arteries, including transposition with intact ventricular septum, with ventricular septal defect with or without aortic arch hypoplasia, with Taussig-Bing anomaly and with complex coronary artery variants.

Materials and methods:
Between 2010 and 2016, 126 consecutive patients who underwent ASO for D-TGA or Taussig-Bing anomaly were included in this study. The median age at the operation was 8 (1-28) days, and 96 patients (75 %) underwent ASO less than 2 weeks. The median weight was 3.2 kg and minimal weight 1,5 kg (Table 1).

	D-TGA
Patients	126 (♂79, ♀47)
Age (days)	1-28 (8,1 ± 6,4)
Weight (kg)	1,5-4,9 (3,2±1,1) Weight <2,5 - 5 babies
Balloon atrial septostomy	11 (8,7%)
Anatomy	Simple TGA - 89 Complex TGA - 31 Taussig-Bing - 6
Coronary anatomy	Normal - 119 Intramural - 5 Single ostium - 1
Concomitant surgery	2 babies: - resection of Meckel's diverticulum - oesophageal pasty

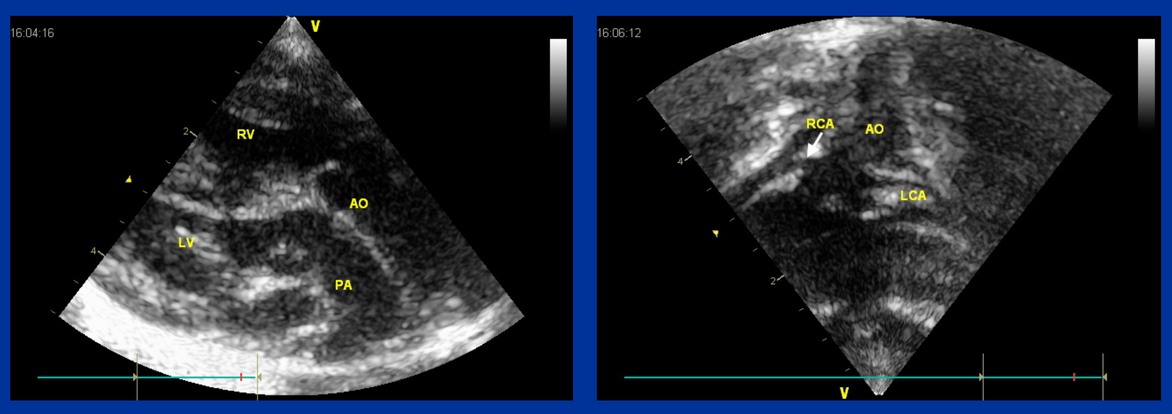
Table I. Preoperative data

Eighty two patients with either simple (n=54) or complex forms (n=22) of TGA, diagnosed prenatally (Pic.1 a,b).



Pic.1 Prenatal ECHO. a- simple TGA, b- TGA with PAS

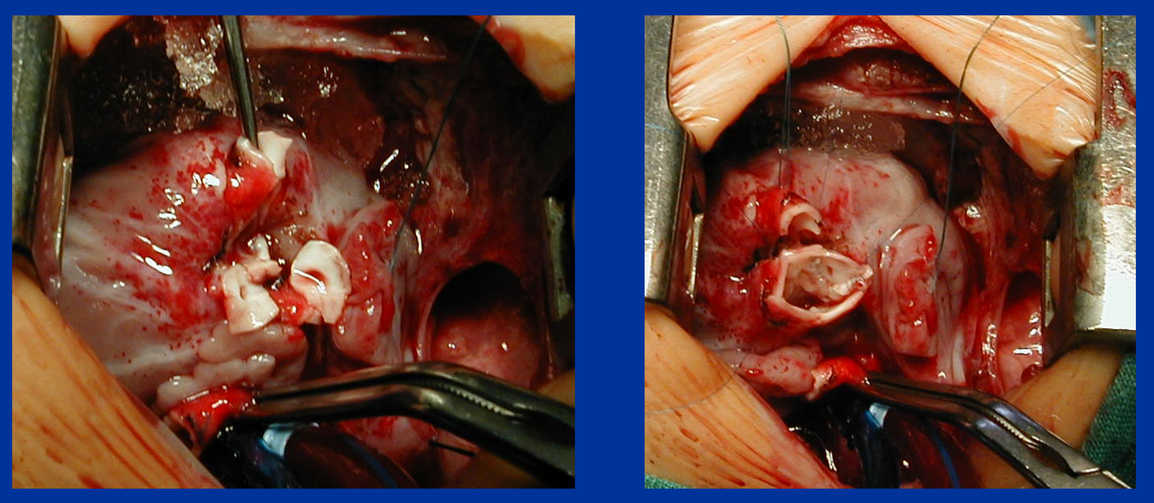
ECHO was the most important diagnostic tool in evaluation of anatomy, including anatomy of CA (Pic2.)



Pic.2. Postnatal ECHO.

Balloon atrial septostomy was performed in 11 cases. The patients were divided into groups: simple TGA (n = 89), complex TGA (n =31) included those who had TGA with VSD or other anomalies, and Taussig-Bing anomaly with aortic arch obstruction (n = 6). Intramural coronary arteries were detected in 5 of them and single coronary artery in 2 babies. In two cases previously was performed abdominal surgical procedures: resection of Meckel's diverticulum and esophageal plasty.

All patients with TGA underwent an arterial switch procedure ± VSD closure and arch repair (Pic.3). The trap-door technique of coronary artery transplantation was used in 81% of cases. In cases of unusual coronary anatomy, aortocoronary flap technique (n=4) and Individual coronary button technique with unroofing (n=3) was used.



Pic. 3. Arterial Switch operation. Translocation of coronary arteries

Results:
Median follow-up duration was 29 (0.2-72) months. There were 4 (3,1 %) in-hospital deaths - 2 patient with complex coronary anatomy and 2 babies with aortic arch obstruction repair (Table2). There was no late deaths.

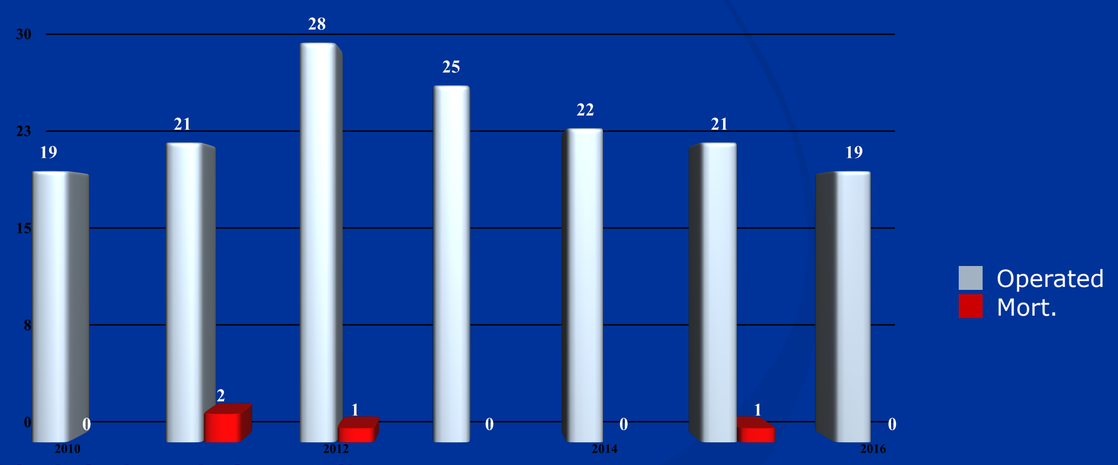


Table 2. In-hospital mortality

7 patients (5.7 %) required reintervention during follow up: AV insufficiency repair - 1, ASD closure - 1, PA plasty - 1, PA stenting - 1 and PA ballon angioplasty in 3 patients.

Conclusion:
Prenatal diagnosis and early neonatal clinical suspicion with adequate measures in the first hours after birth are essential to reduce the early mortality in TGA. ASO can be performed with a low risk of early mortality and satisfactory long-term outcomes. Close long-term surveillance is mandatory to detect hemodynamic changes.