



A twenty Year Experience of Arterial Switch Repair by Direct Anastomosis Retaining a Normal Position of the Pulmonary Bifurcation



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Objectives

The arterial switch operation (ASO) has become the procedure of choice for correction of transposition of the great arteries (TGA) since its introduction by Jatene in 1976. The standard technique for reconstruction of the neopulmonary artery involves translocation of the pulmonary bifurcation to lie in front of the aorta (the Lecompte manoeuvre). This requires extensive mobilisation of proximal branch pulmonary arteries and is associated with a significant incidence of pulmonary artery stenosis (PAS). We have reviewed our experience with ASO, utilizing direct pulmonary artery anastomosis, avoiding the routine use of the Lecompte manoeuvre.

Methods

From October 1990 to March 2010, 101 patients underwent correction of TGA, using the ASO in our institution. Patients' characteristics are shown in **Table 1**. The operative steps of the repair technique used in most patients is shown in the **Figure**. In some patients the repair was modified to suit individual anatomical characteristics. Follow up was 100% complete. Surviving patients were assessed for PAS, aortic incompetence, coronary ischaemia and functional class.

Table 1
Baseline Patients' Characteristics

Variable	Number
Sex:	
Male	67 (66.3%)
Female	34 (33.7%)
Age at Operation (days)	12 (2-718)
Diagnosis:	
. TGA, IVS	62 (61.4%)
. TGA, VSD	27 (26.7%)
. TGA, VSD, coarctation	3
. TGA, DORV	4
. TGA, DORV, coarctation	4
. TGA, DORV, IAA	1

Table 2
Surgical procedures before and at ASO

Procedure	Number
Before ASO:	
Aortic arch reconstruction + PA banding	1
Repair of coarctation	1
Repair of interrupted aortic arch + PA banding	1
At ASO:	
VSD closure	23
VSD Closure + aortic arch repair	3
Repair of aortic coarctation	2

Results

There were 8 early (7.92%) and 2 late (1.98%) deaths. Of those who died, 6 were TGA with IVS, 3 were TGA with VSD and one patient had TGA with DORV. Five patients underwent reoperations (**Table 3**). Significant pulmonary artery stenosis has occurred in four of 91 surviving patients (4.4%). Pressure gradients ranged from 42 to 90 mmHg prior to a total of six reinterventions. The remaining 87 patients show a mean pulmonary pressure gradient of 15 mmHg (range 0 – 36). Aortic regurgitation was trivial in 27 patients, and mild to moderate in 9 patients. Eighty eight patients (97%) were in functional class 1 with no symptoms or signs of ischaemia.

Table 3
Re-interventions following the ASO

Re-intervention	Number
Repair of DORV, Relief of RVOT Obstruction and resection of subaortic stenosis	1
Resection of Subaortic Stenosis	1
Repair of coarctation	1
Resection of supravalvular pulmonary stenosis and mitral valve repair	1
Relief of LVOTO, revision of VSD patch and insertion of PPM	1
Balloon Dilatation of Pulmonary Stenosis	4

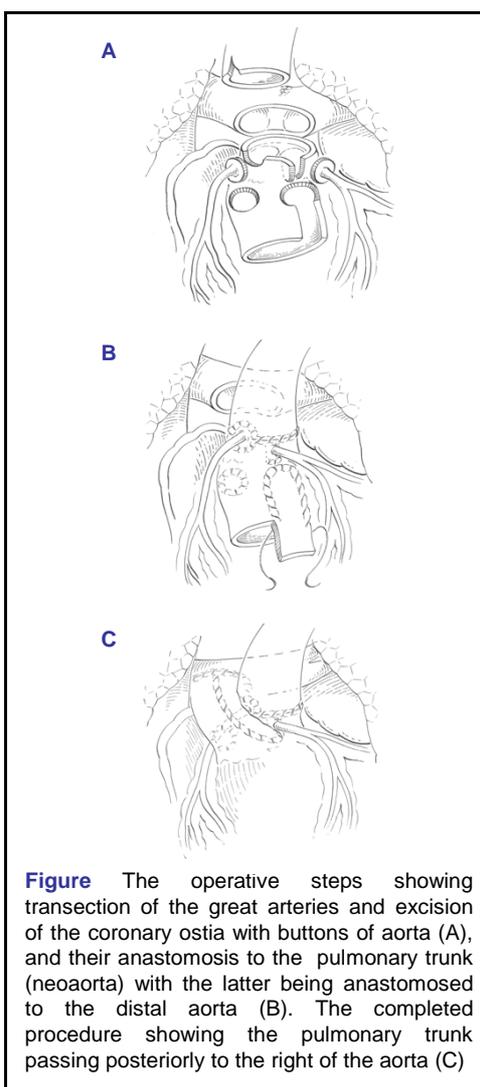


Figure The operative steps showing transection of the great arteries and excision of the coronary ostia with buttons of aorta (A), and their anastomosis to the pulmonary trunk (neoaorta) with the latter being anastomosed to the distal aorta (B). The completed procedure showing the pulmonary trunk passing posteriorly to the right of the aorta (C)

Conclusion

The arterial switch repair by direct anastomosis, retaining a normal position of the pulmonary bifurcation is feasible with an acceptable mortality and a low incidence of significant pulmonary artery stenosis.