

Bi-ventricular repair of Double Outlet Left ventricle - Experience and Review of Literature

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Abstract

Double-outlet left ventricle (DOLV) is a rare congenital cardiac anomaly. The aorta and the main pulmonary arterial trunk arises predominantly from the left ventricle(LV) and is associated with a malaligned ventricular septal defect(VSD), various degrees of hypoplasia of the right ventricle, and presence or absence of pulmonary stenosis. Bi-ventricular repair is the preferred treatment option whenever possible. Various techniques for bi-ventricular repair have been described. The best option for DOLV correction is by translocating the pulmonary root to the right ventricle(RV)[1]. In this series, we report four patients who underwent biventricular repair of DOLV in our institute with excellent outcomes. All patient details were collected from the institute patient record system. Echocardiographic data were obtained from the records. Intraoperative charts were reviewed for further information on the surgical procedure and cardiopulmonary bypass. Postoperative data included survival, functional status and followup echocardiography. Of the four children, three underwent pulmonary root translocation and one child underwent Reparation al etage Ventriculaire(REV) procedure. There was no mortality and all children are in stable clinical condition in the recent follow-up and no re-operations or interventions were required following primary surgical correction. Thus DOLV is anatomically and surgically a challenging subset. Pulmonary root translocation in this anatomy is technically challenging but safe and superior option when compared to other alternative surgical procedures and it can be performed with excellent results, even in infants.

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DOLV new.edited.pdf available at <https://authorea.com/users/324378/articles/452589-bi-ventricular-repair-of-double-outlet-left-ventricle-experience-and-review-of-literature>

Table 1 Patient characteristics and Intra-operative details

PT. NO	AGE	SEX	PREOP DIAGNOSIS	INTRAOP MORPHOLOGY	VSD	CORONARY ANATOMY	PROCEDURE DONE	CPB TIME (MIN)	CROSS-CLAMP TIME (MIN)
1	1 MON	F	dTGA WITH 6MM MUSCULAR VSD, MILD PR, SEVERE PAH	DOLV WITH SIDE BY SIDE GREAT ARTERIES, AORTA TO THE RIGHT OF PA	SUBAORTIC	1R2LCX	VSD CLOSURE WITH PULMONARY ROOT TRANSLOCATION	383	230
2	12Y	M	DORV WITH SEVERE PS, GOOD PA ANATOMY	DOLV WITH SIDE BY SIDE GREAT ARTERIES, AORTA TO THE RIGHT OF PA	SUBAORTIC	1RLCX	VSD CLOSURE WITH PULMONARY ROOT TRANSLOCATION	234	190
3	3Y	M	DORV WITH SEVERE PS, GOOD PA ANATOMY, LAD CROSSING RVOT	DOLV WITH SIDE BY SIDE GREAT ARTERIES, AORTA TO THE RIGHT OF PA, PULMONARY VALVE BICUSPID & STENOTIC	SUBAORTIC	1LCX2R	VSD CLOSURE WITH REV PROCEDURE WITH MONOCUSP RECONSTRUCTION OF RVOT	173	129
4	2 MON	F	dTGA WITH SIDE BY SIDE GREAT ARTERIES, LARGE SUBAORTIC VSD, MILD PR	DOLV WITH SIDE BY SIDE GREAT ARTERIES, AORTA TO THE RIGHT OF PA	SUBAORTIC	1LR2CX WITH DOUBLE LOOPING OF CORONARY AROUND PA	VSD CLOSURE WITH PULMONARY ROOT TRANSLOCATION	214	152

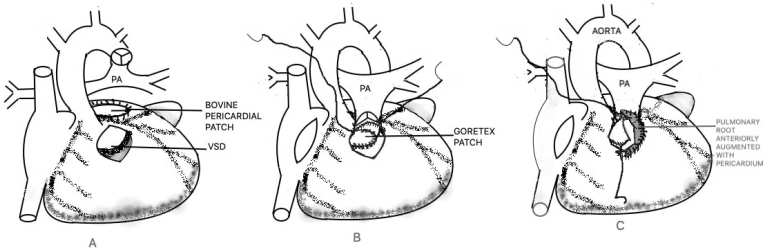
Table 2 Latest follow-up Echocardiographic Findings

Patient no.	RVOT GRAD PEAK (mmHg)	PR	TAPSE	RVSP	LVOT GRAD	LV EF	ROSS MOD- IFIED SCORE	FOLLOWUP (MONTHS)
1	12	2	19	25	16	68	1	17
2	10	1	18	35	16	70	1	15
3	22	2	18	28	10	66	2	12
4	16	NIL	20	45	15	68	1	10

PR – PULMONARY INCOMPETENCE, TAPSE – TRICUSPID ANNULAR PLANE SYSTOLIC EXCURSION, RVSP – RIGHT VENTRICLE SYSTOLIC PRESSURE, LVOT GRAD – LEFT VENTRICLE OUTFLOW TRACT GRADIENT, LVEF – LEFT VENTRICLE EJECTION FRACTION

Table 3 Literature review of Pulmonary root translocation

Author/year	NUMBER OF PATIENTS	VSD	PULMONARY OUTFLOW OBSTRUCTION	GREAT ARTERIES RELATIONSHIP	CORONARY ANOMALIES	PROCEDURE DONE	OUTCOME
Chiavarelli et al. 1992	1	Subaortic	YES	S, D, D	YES	PULMONARY ROOT TRANSLOCATION	UNEVENTFUL
DeLeon et al. 1995	2	Subaortic	YES	S, D, D	YES	PULMONARY ROOT TRANSLOCATION	UNEVENTFUL
McElhinney et al. 1997	3	Subaortic	YES	S, D, D	NO	PULMONARY ROOT TRANSLOCATION	UNEVENTFUL
Ootaki et al. 2001	2	Subaortic	YES	S, D, D	NO	PULMONARY ROOT TRANSLOCATION	UNEVENTFUL



Pulmonary Root translocation technique. A shows harvesting of pulmonary root and closure of the defect in the LV with pericardial patch. B shows VSD closure using gore-tex patch. C shows reconstruction of RVOT using pulmonary root.

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