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Comprehensive Surgical Management of Double Outlet Right Ventricle in an Eight-Year-Old: A Case Report

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Abstract: ***This case represents both the complexity and the potential for recovery in congenital heart defects when timely and precise surgical intervention is undertaken. An eight-year-old boy with a history of cyanosis since birth, recurrent respiratory tract infections, and exertional breathlessness was diagnosed with double outlet right ventricle (DORV) featuring a large subaortic ventricular septal defect, severe valvar pulmonary stenosis, and overriding aorta. Preoperative evaluation revealed right atrial and ventricular dilatation with preserved left ventricular function. The surgical approach involved median sternotomy, cardiopulmonary bypass, and tailored reconstruction, including bovine pericardial tunneling of the left ventricle to the aorta, resection of obstructive right ventricular outflow tract muscle bundles, and augmentation with an autologous patch. Notably, the postoperative course was stable, and the patient was discharged with improved hemodynamics and no complications. This suggests that, despite the inherent risks in such complex congenital cases, meticulous operative planning and execution can lead to favorable outcomes comparable to those reported in specialized pediatric cardiac centers.***

Keywords: double outlet right ventricle, congenital heart surgery, pediatric cardiology, ventricular septal defect, pulmonary stenosis

1. Case Study

8 Years old boy came with complaints of breathing difficulty on exertion.

H/o Cyanosis + on and off since birth

H/o recurrent respiratory tract infection +

Birth history
Born out of Non Consanguineous marriage
FTNVD, Birth weight 2.6 Kg
Vaccinated Upto Date

Maternal History
No H/o of DM/ SHT / CAD / RHD
No H/o fever, smoking, alcohol

Developmental History
Social Smile 2 Months
Pincer grasp – 9 Months
Walking 1 Year
Family & Personal Histroy
Nil Relevant
O/E
Patient Conscious Central Cyanosis +
Oriented Height - 125
CVS S1S2 + Weight 20
ESM + BMI - 12.8
RS Clear MAC - 11 cm
Arms span 120
Upper segment 65
Lower segment 60

Echo - RA, RV Dilated
Large sub aortic VSD
50% Overriding of Aorta
Severe Valvar PS
Velocity 46m/s
gradient 85mmhg
normal LV function
Diagnosis
DORV
Advised Surgery

After obtaining high risk informed consent he was taken up for surgery

Under general anesthesia median sternotomy, Pericardium opened to the left of the midline after rewiring thymus. Aorta bicaval cannulation for cardiopulmonary bypass (CPB). Left SVC cannulated separately and connected to vent line. SVC and IVC snared with umbilical tapes. Right atriotomy, large VSD. Overide of >70% of aortic valve. Bovine pericardial tunnel of LV to aorta with interrupted 5-0 prolene pledgetted sutures. Muscle bundles in RVOT resected after excising a biscuspid, stenotic, dysplastic pulmonary valve. Augmentation of RVOT / MPA done with autologous patch, PFO left open. Heart began to beat in sinus rhythm. Weaned off CPB, RV-PA gradient < 10, RVP < ½ systolic pressure. Decannulated after reversal of heparin. Heamostasis achieved. Sternum approximated with 5 ethibond sutures over with 2 pleural drains. Chest wound closed in layers. Patient transferred to ICU in a stable haemodynamic condition.

Rest of postoperative period was uneventful. Patient discharged with stable vital signs.

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