



TRANS-CATHETER RVOT REHABILITATION IN A RESUSCITATED NEONATE FOR PULMONARY ATRESIA/INTACT VENTRICULAR SEPTUM

Bhushan Kashinath Chavan,¹, Charan Reddy,², Suresh Kumar,³

¹ Mgm Hospital, Apollo Hospital, Navi Mumbai - 410209; Interventional Paediatric Cardiologist; , Child Cardiology, ² Apollo Hospitals; Cardiology, ³ National Heart Centre - Royal Hospital; Believers International Heart Centre; Paediatric Cardiology

History and physical:

A two-week-old neonate (weight 3.5kg) with duct- dependent pulmonary circulation on Prostaglandin E1 infusion and unstable saturations was received in ER. The baby was tachypnoeic, with an oxygen saturation of 85%, and had loud continuous murmur at the left upper sternal border. Chest X-ray showed significant cardiomegaly with reduced vascularity. Electrocardiogram showed sinus rhythm with right axis deviation, poor RV forces and frequent ventricular premature beats. Echocardiography showed valvar pulmonary atresia with intact interventricular septum (PAIVS), tripartite right ventricle with good size pulmonary arteries, large patent ductus arteriosus (PDA) to left pulmonary artery and normal coronaries. The baby was taken up for Trans-catheter perforation of the pulmonary valve under general anaesthesia. The baby had cardiac arrest due to ventricular fibrillation soon after getting femoral access. DC Cardioversion led to severe bradycardia warranting pacemaker support. The baby eventually regained sinus rhythm. The pacemaker was removed and the procedure was continued. After initial angiogram multiple attempts to enter the right ventricle failed. The procedure was abandoned and the baby shifted to paediatric ICU for stabilisation. Over the next few days the baby recovered from acute renal injury and showed no neurologic deficit. It was decided to have another attempt for Trans catheter valve perforation.

Imaging:

Under general anaesthesia, 5F right femoral arterial access and 6F right jugular venous access were secured. Aortogram in the lateral view imaged the PDA well. Using Right Judkins 5F catheter (JR), the PDA was crossed using 0.035 "Terumo wire and the catheter positioned just above the pulmonary valve. Using a micro catheter and the hard end of a 0.014" coronary wire (Run-through), the pulmonary valve was pierced. The micro catheter was pushed over the wire. The wire was removed and catheter position in RV cavity was confirmed using pressure monitoring. Using 5F snare from the jugular access, the wire was snared from the RV cavity and exteriorised from the neck to form an AV loop. Thereafter sequential dilatations of the pulmonary valve was done using non-compliant balloons- 3.5mm x15 mm followed by 5mm x 15mm. Finally Mini-tyshak 7mm x4cm balloon was used to completely dilate the valve. Saturations improved to high 80s and transthoracic echo confirmed a well opened pulmonary valve with moderate pulmonary regurgitation.

Ductal stenting was not considered necessary due to favourable outcome. After removal of access sheaths, the baby was shifted to intensive care unit. Extubation was done the next day and neonate was ready for discharge in a week.

Indication for intervention:

Severe hypoxia due to PAIVS-treatment by Trans catheter intervention.

Learning points of the procedure:

Transcatheter RVOT perforation is a lifesaving procedure in the critically ill neonate with PAIVS. Ductal stenting-not required in this baby-may be needed as an additional procedure, if saturations are not maintained after opening the RVOT.



Fig 1: Transthoracic echo image (modified parasternal view) showing thick hypertrophied right ventricle with septal bowing and valvar pulmonary atresia.

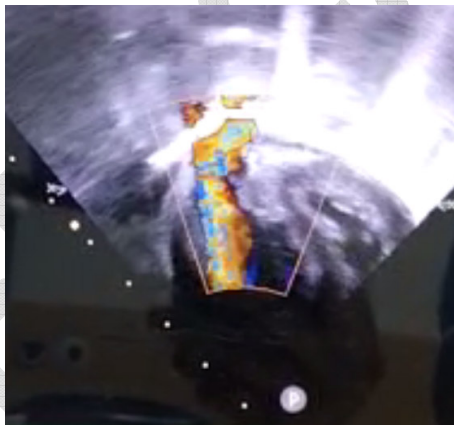


Fig 2: Post procedure transthoracic sub-costal echo image showing well opened pulmonary valve with moderate pulmonary regurgitation.