



SINGLE STAGE DEVICE CLOSURE OF LARGE HYPERTENSIVE BORDERLINE OPERABLE DUCTS

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History and physical:

A 13 year old girl weighing 20 kg with history of effort intolerance was admitted for treatment of congenital heart disease. She had history of congestive heart failure in early infancy which improved over period of time. On examination she had no dysmorphism , no clubbing and cyanosis (spo2: 95%). On clinical examination she had precordial bulge with no cardiomegaly ,normal S1 and loud single S2 with long early diastolic murmur in left upper sternal border .Her chest Xray showed normal cardiothoracic ratio with prominent pulmonary bay with normal lung vascularity .The ECG showed no signs of volume overload .2D Echo was suggestive of large tubular hypertensive PDA to LPA measuring (12mm) at the narrowest portion with left to right shunt with near equalisation of diastolic pressures.

Imaging:

She was taken for cardiac catheterisation under general sedation and planned for device closure , if operable in the same setting with informed consent .Two femoral venous access 6F each and one single arterial access 6F was secured .Right heart catheterisation was done to assess operability. No significant step up between SVC and PA was documented. The pre aortic and PA pressure were documented which were nearly equal [aorta : 100/50(80) ; PA 78/43(57) }. Aortogram was done in straight lateral and RAO view which showed large tubular PDA. It was decided to go ahead with device occlusion of the duct .Using 10F long sheath across the duct ,Cocoon duct occluder (Vascular Concepts) 16x18mm was positioned across the duct .Their was separation of the aortic and PA diastolic mean pressures by 24 mmHg {aorta : 100/60(80) ; PA 78/39(56)} . Repeat angiogram done showed complete occlusion of the duct with smooth flow in arch and LPA. On echo confirmation, the device was released . She was discharged on twice daily doses of sildenafil. Her eight month follow up showed good weight gain (40 kg) , good effort tolerance and echo suggestive of regressed pulmonary artery pressures { mean PA pressure from PR trace 33 mm hg} with good biventricular function. Indication for intervention: Large hypertensive tubular PDA with near equalisation of the diastolic pressures with normal saturation and borderline operability.

Learning points of the procedure:

Device occlusion of large tubular PDA works like balloon occlusion test during catheterisation. Adequate oversizing and proper intraductal positioning is the key to success for these subset of ducts.



Fig 1: Screen shot image of the pressure data post device occlusion of the PDA suggestive of separation of the Aortic and the PA pressures. The upper arterial trace is aortic pressure and the lower trace is pulmonary pressure with definite fall in the diastolic pressures.



Fig 2: Eight month follow up echo image of continuous doppler at the pulmonary valve to measure the mean PA pressure using PR trace.

