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Hybrid procedure to postpone succesful biventricular repair in left heart obstructive lesions with borderline left ventricle.

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Background: In neonates with small left heart lesions, the decision of single ventricle vs biventricular circulation is difficult. Critical morphologic criteria (Rhodes score/ LV adequacy score <0.35 , aortic annulus $<6\text{mm}$, mitral annulus $<9\text{mm}$, LV volume $<25\text{ml}/\text{m}^2$) or physiologic considerations (antegrade flow in ascending aorta, bidirectional shunt at ductal level) were defined to predict risk/success for biventricular repair. To postpone this decision and use the growth potential of left heart structures, neonatal hybrid palliation (bilateral PA banding, stenting duct) can be performed in high risk neonates.

Aims: evaluate results of biventricular repair in high risk neonates after neonatal hybrid palliation for left heart obstructive lesion with small left heart.

Patients and Methods: retrospective study, $n=7$, mean birthweight 3,3 kg. Diagnoses: critical coarctation, arch hypoplasia $n=5$, + VSD in 2, parachute MV and mild MS in 1; critical aortic stenosis $n=2$, + coarctation in 1. All had duct dependent systemic circulation. Mean aortic annulus 4.6mm (4-6mm), mitral annulus 6.7mm (3,7-10mm), LV volume 20.2 ml/m² (14-33ml/m²), LV adequacy Rhodes score -2.8, precluding biventricular repair. Hybrid palliation was performed: bilateral PA banding and stenting of the arterial duct, +/- atrial septostomy ($n=3$).

Results: Neonatal hybrid palliation was successful in all 7 patients obtaining adequately balanced circulations. In 2 patients with critical AS a balloon valvuloplasty was performed. At a mean age of 6.2 mths left heart structures had grown: mean aortic annulus 8,7mm, mean mitral annulus 9,8mm, LV volume 25ml/m². Biventricular repair was achieved in all patients: aortic arch reconstruction, PA debanding, duct closure ($n=7$)+VSD closure in 2 pts.

Conclusions: hybrid procedure allows to postpone the decision of uni- versus biventricular repair in small left heart lesions. Loading conditions after birth with increased LA and LV filling may alter LV volume and size of LVOT and MV, so that successful biventricular circulation can be achieved at an older age with lower risk.