An old surgical approach renewed: Pulmonary Artery Banding for treatment of Left Ventricular Dilated Cardiomyopathy

Pediatric Heart Center, Justus-Liebig University Giessen, Germany

Background Dilated cardiomyopathy (DCM) in childhood has a considerable morbidity and mortality. Based on the experience of Pulmonary artery banding (PAB) in patients with sub-aortic right ventricle, we adopted this old surgical approach of PAB in young patients with left ventricular dilated cardiomyopathy (LV-DCM) with preserved right ventricular function.

Methods: A retrospective single center observational study; evaluation of transcatheter dilatable surgical PAB in infants and young children with LV-DCM.

Results: Since April 2006 17 infants and two toddlers with LV-DCM who were referred to our centre for Heart Transplant received a PAB. Five of the patients underwent additional mitral valve repair or replacement, repair of a left-sided Anomalous Pulmonary Vein Return, re-implantation of an ALCAPA. All patients had been on catecholamines. There was no hospital mortality. All patients showed clinical improvement.

In the 12 patients without additional operation the pressure gradient across the PAB increased significantly within 3-6 months. The LV ejection fraction increased from 15% (median) pre-PAB to 43% at discharge home, and 47%, 3-6 months later. The median LVEDD z-score decreased (p>0.001) from +7.3 to +3 and +1.3, respectively. Plasma B-type natriuretic peptide levels decreased, corresponding to the functional class improvement (P<0.001). Eight children were subsequently (partially) de-banded by trans-catheter technique and are currently functional class 1. Two patients with non-compaction DCM deteriorated 5 and 6 months after PAB-de-banding and died. One of the five patient with additional cardiac surgery died during the follow-up.

Conclusion: In young children with LV-DCM and preserved right ventricular function, PAB can lead to an improvement of left ventricular and mitral valve function by ventricular interaction and might offer a way to delay or even prevent transplant.