

## MP2-2

### **Impaired Cardiac Mechanics in a Large Population of Children with Heart Transplantation: A Speckle Tracking and Three-Dimensional Echocardiography Study**

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**Background:** Cardiac dysfunction is a life threatening condition in heart transplanted kids. The purpose of our study was to evaluate advanced echocardiographic indices of cardiac function in a sample of pediatric heart transplant.

**Methods:** 60 pediatric patients with stable cardiac transplantation and 60 matched healthy controls were included in the study. All individuals underwent transthoracic echocardiographic examination including tissue Doppler, 2D-speckle tracking and three-dimensional echocardiography. 2D-Speckle tracking analysis was used to obtain measures of left ventricular radial, circumferential and longitudinal strain, and to derive left ventricular twist and torsion. Three-dimensional echocardiography was used to measure left ventricular volumes, ejection fraction and to evaluate left ventricular systolic synchrony.

**Results:** No differences were observed between the two groups in left ventricular volumes, left ventricular ejection fraction, or right ventricular fractional area change. However, transplanted patients showed lower values of longitudinal systolic excursion of valvular planes at both the mitral and the tricuspid valve level, as well as higher mitral E/E' ratio (all  $p < 0.05$ ). Cardiac radial strain was similar between groups, while a significant net reduction in both global left and right ventricular longitudinal strain as well as in left ventricular global circumferential strain could be observed between the two groups (all  $p < 0.05$ ). In addition reduced left ventricular twist and torsion was found in patients with cardiac transplantation as compared to normal subjects ( $p < 0.01$ ) mainly due to a significant reduction in basal rotation ( $p < 0.05$ ). Eventually, in 20% of our cardiac transplant patients - and none of the controls - overt systolic dyssynchrony was observed.

**Conclusion:** even in the absence of acute rejection and in the presence of a normal ejection fraction, children with transplanted heart show a significant reduction in subclinical markers of biventricular function. Additional prognostic studies are needed to establish whether these abnormalities predict the incidence of future development of clinically evident cardiac dysfunction.