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**RV-dysfunction - Does it affect left ventricular torsion?**

*Laser KT. (1), Hauffe P. (1), Aslan I. (1), Uges G. (1), Körperich H. (2), Beck C. (1), Haas N. (1), Sandica E. (1), Kececioglu D. (1)  
Center of Congenital Heart Disease (1); Inst. for Radiology, Nuclear Med. and Molecular Imaging (2), HDZ-NRW, Bad Oeynhausen, Germany*

**Background:** Right ventricular dysfunction can induce changes in left ventricular deformation by RV/LV interaction. We investigated the influence of changes in RV-loading conditions as well as RV-Pacing on LV-rotation.

**Methods:** 20 patients with ASD (median 8y), 18 patients with valvular pulmonary stenosis (PST, median 2.9y) and 50 patients with chronic RV-pacing (PM, median 14y) were examined with a Vivid 7 ultrasonic device. Patients undergoing interventions were examined 4 hours after the procedure again. Healthy children served as body-surface area matched controls. Maximal torsion and other rotational values were determined by speckle-tracking (Echopac, 2D-Strain, GE). For statistical analysis a Student's T-Test was used.

**Results:** In patients with ASD maximal torsion was elevated before intervention in comparison to healthy controls ( $17.8 \pm 8.4^\circ$ ,  $p < 0.05$ ) and dropped significantly after intervention ( $11.3 \pm 5.4^\circ$ ,  $p < 0.01$ ). Similar results were obtained by relief of PST ( $14.8 \pm 5^\circ$  vs  $10.3 \pm 5.3^\circ$ ,  $p < 0.05$ ). In contrast to healthy children PM-patients had their peak basal rotation before peak apical rotation ( $p < 0.05$ ) resulting in a decreased delay between apical and basal rotation ( $-2.0 \pm 33\%$  vs  $16.9 \pm 14.7\%$  of cardiac cycle,  $p < 0.0001$ ).

**Conclusions:** Curation of RV volume- or pressure-overload by ASD-closure or balloon dilatation of PST is followed by normalization of LV rotational deformation. Electrical abnormal RV cardiac stimulation can influence LV torsion by reversing the timing of basal and apical peak rotation making it an interesting tool for the investigation of dyssynchrony.