

Does Tissue Motion Annular Displacement of the Tricuspid Valve measuring by two dimensional Speckle Tracking Echocardiography Predict the Right Ventricular Ejection Fraction?

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Background

Now magnetic resonance imaging (MRI) has become new gold standard for determining the right ventricular ejection fraction. A few of previous studies showed that mitral valve tissue motion annular displacement (TMAD) measured by two dimensional speckle tracking echocardiography (2DSTE) is a simple, effective, and highly reproducible method of assessing the left ventricular ejection fraction in normal children. We performed TMAD for tricuspid valve in patients with repaired Tetralogy of Fallot (TOF) patients and healthy peers. We try to determine any correlation between cardiac MRI (cMRI) derived right ventricular ejection fraction and tricuspid valve TMAD measurements.

Method

The study consisted of 20 patients with repaired TOF and 22 age and body surface area matched healthy peers. Tissue motion annular displacement was measured by 2DSTE. Septal, lateral and midpoint displacement of the tricuspid valve was measured. Right ventricular ejection fraction was determined by cMRI in 12 of study patients. Correlation analysis was performed to evaluate the relationship between cMRI derived right ventricular ejection fraction and percentage of TMAD measurements in patients with repaired TOF.

Results

The mean ejection fraction derived from cMRI was 43.6 ± 9.11 % in 12 of study patients. We found a negative correlation between tricuspid TMAD midpoint measurements and cMRI-derived ejection fraction ($r = -0.68$, $p = 0.016$). We found significantly difference between study and control groups in terms of septal (10.92 ± 4.57 and 8.07 ± 4.02 , respectively) ($p = 0.039$), lateral (7.40 ± 4.14 and 12.24 ± 3.31 respectively) ($p < 0.01$) and percentage of total change (11.01 ± 5.13 % and 14.09 ± 4.19 %, respectively) ($p = 0.041$) values.

Conclusion

Tissue motion annular displacement of the tricuspid valve is a simple, effective, and highly reproducible method of assessing the ejection fraction of right ventricle in patients with TOF. It has an highly strong negative correlation with cMRI-derived ejection fraction.