IMAGING AND DIAGNOSTIC TESTING

QUANTIFICATION OF LEFT ATRIAL (LA) STRAIN BY MULTIMODALITY TISSUE TRACKING FROM MAGNETIC RESONANCE IMAGING (MRI) - VALIDATION AND RELATIONSHIP TO AGING

ACC Poster Contributions
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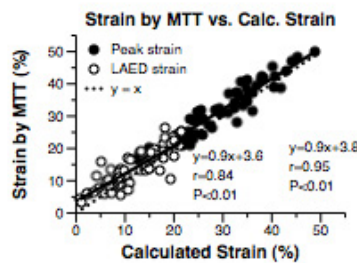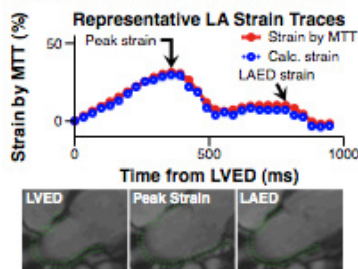
Background: Assessment of LA function is important but challenging due to lack of appropriate non-invasive measures. We have introduced multimodality tissue tracking (MTT) as a new automated pixel-based pattern matching technique for quantification of cardiac and vascular deformation. We investigated if LA strain can be quantified by MTT analysis of MRI cine and if LA strain is related to aging.

Methods: In 30 volunteers (age 46±12) LA strain was quantified by MTT analysis. As a reference method, LA strain was calculated frame-by-frame from manual endocardial delineation. Magnitude and timing was measured at LV end-diastole (ED), peak strain, and at LAED in 2- and 4-ch views. Passive LA strain was defined as the difference between peak- and LAED strain. LV mass and volumes were calculated from LV short-axis stacks obtained by MRI.
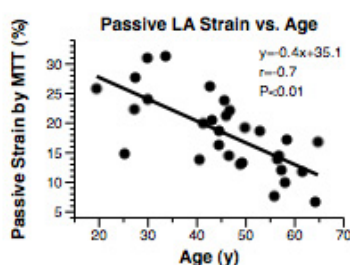
Results: Pooled analysis showed excellent correlation and agreement for magnitude (mean d; -2.1±3.0%), and for timing (R=0.97, P<0.01; -0.9±33.2ms) of LA strain. We observed a close correlation between passive LA strain and age. In a regression analysis passive LA strain was associated with age independent to LV mass- and LVED volume index.

Conclusion: We have demonstrated that the magnitude and timing of LA strain can be accurately quantified by MRI. Furthermore, ageing is associated with a reduction in passive LA strain, indicating a stiffening of the atrial wall. MTT MRI analyses has the potential of becoming a powerful non-invasive tool for comprehensive assessment of LA function.