GLOBAL CIRCUMFERENTIAL STRAIN BY CMR FEATURE TRACKING OR ECHOCARDIOGRAPHIC SPECKLE TRACKING STRONGLY PREDICTS CLINICAL OUTCOMES IN PATIENTS WITH SYSTOLIC HEART FAILURE

Poster Contributions
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Authors: Stephanie C. Haberman, Toshinari Onishi, Daniel Ludwig, Erik Schelbert, John Gorcsan, University of Pittsburgh, Pittsburgh, PA, USA

Background: Prediction of prognosis in patients with systolic heart failure (HF) is of clinical importance.

Objective: To test the hypothesis that global circumferential strain (GCS) as a new measure of left ventricular (LV) function may predict prognosis using novel cardiac magnetic resonance (CMR) Feature Tracking analysis or echocardiographic speckle tracking.

Methods: We studied 120 consecutive HF patients, aged 59±16 yrs, referred for CMR with ejection fraction ≤35%; 90 also had echocardiography. GCS was determined from mid-LV short axis images using Feature Tracking software (TomTec Corp.) applied to routine DICOM CMR images and speckle tracking applied to echo images. Long-term outcome events were predefined as death, transplant or LV assist device (LVAD) over 1.5 years.

Results: Group mean GCS was 8±4% by CMR feature tracking and was similar by echo speckle tracking 11±7%. There were 25 unfavorable events: 17 deaths, 2 transplants, and 4 LVADs. Using receiver operator characteristic curve analysis for event-free survival a GCS cut-off of 6.5% was determined. GCS < 6.5% was highly significantly associated with poor clinical outcomes: CMR hazard ratio (HR) of 3.06 with a 95% CI of 1.35 - 6.94, p=0.0076, and echo HR of 5.07 with a 95% CI of 1.79 - 14.37, p=0.0023.

Conclusions: GCS is a novel non-invasive imaging approach that may be successfully applied to routine clinical CMR and echo images that predicts survival in patients with systolic HF, and has promise for clinical utility.