ACC.12
61st Annual Scientific Session & Expo
ACC-i2 with TCT innovation in intervention

E914
JACC March 27, 2012
Volume 59, Issue 13

Heart Failure

ASSESSING GLOBAL SCAR BURDEN USING ECHOCARDIOGRAPHY IN PATIENTS UNDERGOING CARDIAC RESYNCHRONIZATION THERAPY: A COMPARISON OF 2D AND 3D SPECKLE TRACKING WITH CARDIAC MAGNETIC RESONANCE IMAGING

ACC Moderated Poster Contributions
McCormick Place South, Hall A
Monday, March 26, 2012, 9:30 a.m.-10:30 a.m.

Session Title: Optimizing the Benefit of Cardiac Resynchronization Therapy
Abstract Category: 13. Heart Failure: Therapy
Presentation Number: 1221-365

Authors: *Anna Kydd, Fakhar Khan, Liam McCormick, Deepa Gopalan, Munmohan Virdee, David Dutka, Addenbrooke's Hospital, Cambridge, United Kingdom, Papworth Hospital, Camrbidge, United Kingdom*

Background: Global scar burden is recognized as an important factor in determining response to cardiac resynchronization therapy (CRT). Cardiac magnetic resonance imaging (CMR) remains the gold standard for scar quantification. Myocardial deformation imaging, using 2D speckle tracking, correlates with scar burden and transmurality. The role of 3D speckle tracking, with potential benefits over 2D techniques, is not defined. The aim of this study was to compare strain values from 2D and 3D speckle tracking with global scar burden on CMR, and relate this to response following CRT.

Methods: 30 patients (23 ischaemic, 7 non-ischaemic), referred for CRT (QRS >120ms, EF <35%, NYHA class III/IV), underwent 2D speckle tracking echocardiography (echo) and CMR prior to device implantation. 10 of thes patients were also assessed with 3D speckle tracking in addition to 10 normal controls (Vivid 7 GE Ultrasound system, EchoPac). 2D echo evaluation was repeated 6 months after CRT. Response was defined as >15% reduction in LV end systolic volume. Scar burden was quantified based on extent and transmurality of hyperenhancement (Q Mass, Medis) and compared with 2D global circumferential strain (GCS), global radial strain (GRS), global longitudinal strain (GLS) and 3D global strain parameters.

Results: 2D GLS correlated with total scar burden (%) on CMR ($r= 0.5$ $p<0.05$). At follow up GLS was not significantly different between responders (-8.45 ± 1.07 $n= 19$) and non-responders (-5.8 ± 1.15, $n=11$, $p=0.15$). 2D GCS and GRS correlated poorly with scar burden and did not differentiate responders from non-responders. All parameters of 3D global strain were significantly reduced in the patient group compared with normal controls. 3D GCS, GLS, and global area strain (GAS) correlated with extent of global scar. The correlation was strongest for 3D GCS ($r =0.922$, $p<0.05$). 3D GLS, GRS, and GAS were all significantly higher in responders when compared with non-responders ($p<0.05$; $p<0.01$; $p<0.05$).

Conclusions: 3D speckle tracking is feasible and demonstrated a stronger correlation with scar burden that 2D strain parameters in this study. 3D GLS, GRS and GAS parameters may independently predict response to CRT.