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Non Invasive Imaging

LATEST MECHANICAL ACTIVATION MAPPING BY THREE DIMENSIONAL STRAIN ECHOCARDIOGRAPHY AND FEASIBILITY OF FUSION IMAGING WITH FLUOROSCOPY TO GUIDE LEFT VENTRICULAR LEAD POSITIONING FOR CARDIAC RESYNCHRONIZATION THERAPY

Oral Contributions

Room 146 B

Saturday, March 29, 2014, 8:45 a.m.-9:00 a.m.

Session Title: Expanding the Horizons of Echocardiography

Abstract Category: 15. Non Invasive Imaging: Echo

Presentation Number: 906-06

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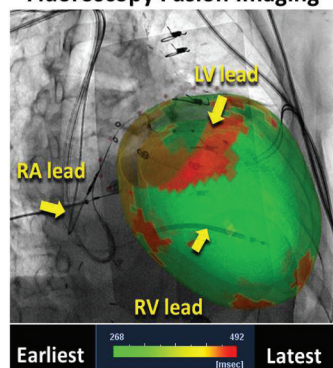
Background: Guidance of the left ventricular (LV) lead toward site of latest mechanical activation by speckle tracking echo improves outcomes for cardiac resynchronization therapy (CRT).

Methods: We used a novel 3D speckle tracking echo approach (Toshiba Corp.) in 30 heart failure patients for CRT with ejection fraction (EF) $\leq 35\%$ and QRS 157 ± 24 ms. 3D peak strain was color coded with green as earliest and red as latest. The first aim in 30 patients was to assess EF and end systolic volume index (ESVI) at 6 and 12 months after CRT with respect to LV lead position. The second aim in two patients was to demonstrate the feasibility of fusion imaging of the 3D echo map with fluoroscopy and coronary venography (Prototype System, Infinix-i, Toshiba Corp.).

Results: Of 27 patients with 3D strain data (90%), LV lead position was concordant with latest activation in 10 (37%) and discordant in 17 (63%). Patients with concordant LV leads had greater improvements in EF and ESVI after CRT at both 6 and 12 mo. (22 ± 4 to $36 \pm 11\%^*$ and $43 \pm 11\%^*$ and 91 ± 39 to 53 ± 20 ml/m $^2^*$ and 44 ± 22 ml/m $^2^*$ (* $p < 0.05$)). 3D Fusion imaging successfully visualized the relation between LV lead position and latest activation site.

Conclusions: Fusion imaging of 3D strain echo mapping was feasible and concordance of LV lead with the site of the latest activation was associated with greater improvements in EF and LV volumes and has promise for clinical application.

3D Echo Mechanical Activation Fluoroscopy Fusion Imaging



End Systolic Volume Index After CRT

