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

E1179
JACC March 27, 2012
Volume 59, Issue 13

# Imaging

## RIGHT TO LEFT VENTRICULAR APICAL CONTRACTION INTERVAL--A NEW INDEX OF VENTRICULAR DYSSYNCHRONY DERIVED FROM SPECT GATED BLOOD POOL RADIONUCLIDE VENTRICULOGRAPHY

ACC Moderated Poster Contributions
McCormick Place South, Hall A
Saturday, March 24, 2012, 9:30 a.m.-10:30 a.m.

Session Title: Evaluation of Left Ventricular Dyssynchrony by Myocardial Perfusion Imaging
Abstract Category: 23. Imaging: Nuclear
Presentation Number: 1107-357

Authors: *Andrew Van Tosh, Kenneth J. Nichols, Mark Goldman, Kathy Muratore, Christopher J. Palestro, Nathaniel Reichek, St. Francis Hospital--The Heart Center, Roslyn, NY, USA, North Shore-LIJ Health System, New Hyde Park, NY, USA*

**Background:** Left ventricular dyssynchrony (LVD) is an important determinant of prognosis in heart failure (CHF) pts. and can be treated with biventricular pacing (BiV). Noninvasive imaging parameters have failed to predict clinical response to BiV. Phase analysis of SPECT radionuclide ventriculography (RNV) can identify apical aneurysms (Nuc Med Comm 2010;31:881), but use of RNV parameters for analysis of LVD has been limited.

**Methods:** We evaluated 91 pts (70M, age 67+13) with CHF who had RNV and 12-lead ECG. RNV data were analyzed using an established method (Int J CV Imag 2008;24:717) to determine regional contraction phase (time to peak contraction normalized to RR interval, expressed as %RR) of 17 LV and 17 RV segments. We calculated ejection fraction, Z-score (an accepted index of phase standard deviation and LVD; Z>2.0 is abnormal), and apical phase lag (APL), the time delay, in %RR, from RV to LV apical peak phase. ECG QRS morphology and duration were also measured.

**Results:** LV Z-score correlated inversely with LV EF (r= -0.56, p<0.0001), and RV Z-score with RV EF (r= -0.55, p<0.0001). Z-score correlated weakly with QRS duration, but did not achieve statistical significance (r=0.19, p=0.07). APL correlated with QRS duration (r=0.34, p=0.002 ) and less so with LV EF (r= -0.19, p=0.07). APL in pts with normal QRS duration and LV EF>35% averaged -0.02%RR, for no delay in RV vs. LV apical peak phase. By ROC analysis, APL>5% was considered abnormal. Pts were divided into two groups based on whether they would qualify for BiV. Group I: (35 pts with LVEF <35% and QRS>0.12 sec.) and Group II (56 pts who did not meet LVEF or QRS criteria). APL successfully separated Group I from Group II pts (6.0+7.7 vs. 0.3+6.7, p<0.001). ROC analysis indicates that an APL>5.0 was superior to a Z-score (p<0.02) in separating Group I from Group II pts,

**Conclusions:** Phase analysis of RNV is useful in detecting LVD in pts being evaluated for CH). APL, a new index of LVD, may be superior to Z-score in identifying patients with sufficient LVD to qualify for BIV. Prospective studies are needed to determine whether APL can successfully predict clinical response to BiV in CHF pts.