



ACC.15

TCT@ACC-12 | innovation in intervention

A1181
JACC March 17, 2015
Volume 65, Issue 10S

Non Invasive Imaging (Echocardiography, Nuclear, PET, MR and CT)

T1 MAPPING AND QUANTIFICATION OF DIFFUSE MYOCARDIAL FIBROSIS IN PATIENTS WITH VENTRICULAR TACHYCARDIA

Poster Contributions

Poster Hall B1

Saturday, March 14, 2015, 3:45 p.m.-4:30 p.m.

Session Title: Non Invasive Imaging: CMR and Myocardial Tissue Characterization

Abstract Category: 18. Non Invasive Imaging: MR

Presentation Number: 1137-046

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Background: T1 mapping allows for accurate assessment of diffuse myocardial fibrosis. The relationship between diffuse fibrosis based on T1 mapping and ventricular tachycardia (VT) is unknown.

Methods: Patients were referred for CMR evaluation of new-onset cardiomyopathy (CMP). 10 patients with a history of VT and 11 EF-matched controls with non-ischemic CMP were enrolled. No patients had a history of hypertrophic or restrictive CMP. Patients with VT had documented sustained monomorphic VT (including idiopathic VT), polymorphic VT, or ventricular fibrillation. Using 1.5T MR scanner, non-contrast T1 mapping images of LV were acquired by using slice-interleaved T1 (STONE) sequence.

Results: On LGE MRI, 3 VT patients and 1 control subject had myocardial enhancement. On segment-based analysis, after excluding 8 segments with positive LGE, T1 value was significantly higher in VT patients (153 segments) compared to control subjects (175 segments) (1137 ± 87 vs. 1110 ± 57 ms; $P < 0.001$) (Figure). There was no significant difference between the two groups in terms of LVEF (47 vs. 51%; $p = 0.62$), LV end-diastolic volume index (106 vs. 100 mL/m²; $p = 0.76$), or LV mass index (54 vs. 58 g/m²; $p = 0.76$).

Conclusion: Patients with a history of VT had significantly higher T1 value when compared to EF-matched controls despite similar LV anatomy. T1 mapping might provide an accurate and non-invasive assessment of subclinical myocardial dysfunction in patients with non-ischemic cardiomyopathy with potential substrate for VT.

Figure: (Top) Mapping image of a 65 year-old man with VT and abnormal T₁ in the 16-segment analysis; (Bottom) Mapping image of a 51 year-old patient without VT

