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# Non Invasive Imaging

## NON-INVASIVE CHARACTERIZATION OF CHRONIC MYOCARDIAL INFARCTIONS USING T1 MAPPING BASED CARDIOVASCULAR MAGNETIC RESONANCE AT 3T WITHOUT EXOGENOUS CONTRAST AGENTS

Poster Contributions
Hall C
Sunday, March 30, 2014, 9:45 a.m.-10:30 a.m.

Session Title: CMR in Ischemic Heart Disease
Abstract Category: 17. Non Invasive Imaging: MR
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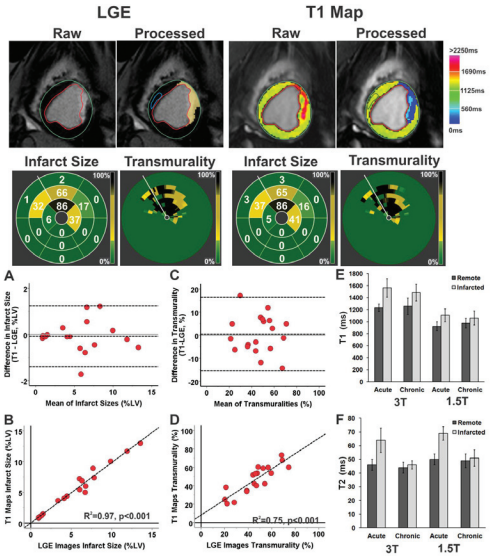
**Background:** Late Gadolinium Enhancement (LGE) Cardiovascular Magnetic Resonance (CMR) for characterizing myocardial infarctions (MIs) requires gadolinium infusion which is contraindicated in 40% of MI patients due to chronic end-stage kidney disease. In a canine model, we tested the hypothesis whether contrast-free T1 mapping at 3T can characterize chronic MIs with high diagnostic accuracy.

**Methods:** Canines (n=29) underwent CMR on day 7 (acute; AMI) and month 4 (chronic; CMI) post-reperfused MI. Infarct location, size (IS) and transmurality (IT) were compared between contrast-free T1 maps and LGE images at 1.5T and 3T. Resolution of edema between AMI and CMI was examined using contrast-free T2 maps.

**Results:** At 3T, T1 maps overestimated IS and IT in AMI relative to LGE images ($p<0.01$ for both cases). However, T1 maps and LGE images were not different for measuring IS ($p=0.61$) and IT ($p=0.81$) in CMI at 3T. At 1.5T, T1 maps underestimated IS and IT relative to LGE images in AMI ($p<0.01$ for both cases) and CMI ($p<0.01$ for both cases). Relative to the remote myocardium, T1 of the infarcted myocardium was elevated in CMI ($p<0.01$) and AMI ($p<0.01$); and T2 of the infarcted myocardium was elevated in AMI ($p<0.01$), but not in CMI ($p=0.19$) at both 3T and 1.5T. Masson's Trichrome staining showed replacement fibrosis within CMI territories. CMI detection sensitivity and specificity of T1 CMR at 3T were 95% and 97%, respectively.




**Conclusions:** Contrast-free T1 maps at 3T can characterize CMI with high diagnostic accuracy.