

Poster presentation

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## Unique technique of strain analysis using image tracking method for tagging MRI and non-tagged cine SSFP images: validation by using Pig Model with myocardial infarction

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from 13th Annual SCMR Scientific Sessions  
Phoenix, AZ, USA. 21-24 January 2010

Published: 21 January 2010

*Journal of Cardiovascular Magnetic Resonance* 2010, **12**(Suppl 1):P246 doi:10.1186/1532-429X-12-S1-P246

This abstract is available from: <http://jcmr-online.com/content/12/S1/P246>

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### Introduction

Assessment of cardiac function is essential for the assessment of the patients with cardiovascular diseases. Especially strain analysis using tagging MRI is extremely valuable for the assessment of the regional cardiac function. However, this analysis using tagging MRI is limited by tag fading and complicated analysis methods.

### Purpose

We developed the software of strain analysis using image tracking for non-tagged standard steady state free precession (SSFP) cine MRI. The purpose of this study was to compare strain analysis by image tracking of SSFP cine MRI to HARP analysis of tagging MRI by using Pig model with myocardial infarction.

### Methods

In four pigs with myocardial infarction, strains were measured in short axis view and long axis view of left ventricle, using automated tracking of image pattern (ZIOSoft Inc) visible in tagging MRI and non-tagged cine MRI. Left ventricle strains by our software were compared to measures with conventional tagging MRI by HARP (Diagnosoft Inc). Analyses were performed on the identical location of middle and base LV slices. Average Ecc was compared via Spearman rank correlation and Bland-Altman comparison of methods in each segmented region.

### Results

Our automated tracking system using image pattern precisely detected inner and outer contour of left ventricle and strain values were calculated in each segmented region. There was an excellent correlation and agreement for strain by HARP and strain by image tracking Ecc analysis of tagging MRI ( $r = 0.85$ ,  $P < 0.0001$  and  $-0.3 \pm 5.2$ ) and non-tagged cine MRI ( $r = 0.61$ ,  $P < 0.0001$  and  $0.8 \pm 8.8$ ), respectively.

### Conclusion

Strain analysis using our image tracking method is a feasible for the assessment of non-tagged SSFP cine MRI as well as tagging MRI, indicating a new unique approach for clinical comprehensive assessment of regional cardiac function.