Journal of Cardiovascular Magnetic Resonance

ORAL PRESENTATION　　　　　　　　　　　　　　　　　　　　**Open Access**

3.0T motion-corrected single-shot phase sensitive inversion recovery (PSIR) late gadolinium enhancement (LGE) in free-breathing patients compared with conventional segmented breath-held LGE

Lu Lin[1], Yining Wang[1], Jian Cao[1*], Lingyan Kong[1], Jing An[2], Tianjing Zhang[2]

Background
Novel motion-corrected single-shot phase sensitive inversion recovery (PSIR) late gadolinium enhancement (moco-LGE) cardiovascular MR in 3.0T system may have advantages over conventional segmented breath-held LGE (bh-LGE), especially for vulnerable patients with arrhythmia or respiratory motions.

Methods
In a consecutive cohort of 58 patients referred for clinical enhanced cardiac MR, bh-LGE and moco-LGE were collected contemporarily with identical image parameters using a 3.0T scanner. The moco-LGE was acquired just after the bh-LGE while the patients were asked to breathe freely. Images were randomized and scored for image quality (1-very poor and not analyzable, 2-poor, 3-acceptable, 4-good, 5-very good) and diagnostic confidence for myocardial LGE (1-low confidence, 2-some confidence, 3-high confidence) separately base on the American Heart Association 17-segmented model. In patients with diagnostic image quality and definite LGE with identifiable margin, the myocardial LGE mass was quantified. Paired t test was used to compare the image quality, diagnostic confidence. Linear regression and correlation plots were used to compare LGE mass.

Results
55 patients had regular heart rate (HR), the mean HR was 78±14 beats per minute (bpm). The other 3 patient

had irregular HR including atrial fibrillation and atrial flutter. In all the patients, the moco-LGE with free-breathing had similarly high image quality (3.9±0.9 vs 3.7±0.9, P=0.410), and diagnostic confidence (2.8±0.3 vs 2.7±0.4, P=0.743) compared with bh-LGE. A total of 16 patients with marked image artifacts in bh-LGE for arrhythmia or respiratory motion, moco-LGE had significantly higher image quality (3.8±0.8 vs 3.0±0.9, P=0.000) and confidence(2.8±0.2 vs 2.4±0.4, P=0.000). The myocardial LGE mass was quantified and compared in 22 patients, the results correlated highly (R^2=0.95, P=0.000) without bias.

Conclusions
In general, moco-LGE and bh-LGE have similar image quality and myocardial LGE quantification. In vulnerable patients with marked artifacts of bh-LGE, moco-LGE

Figure 1

BioMed Central

probably has higher image quality and diagnostic confidence.

Funding

N/A.
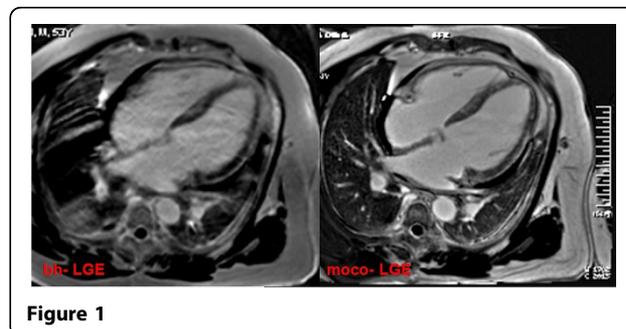
Authors' details
[1]Radiology, Peking Union Medical College Hospital, Beijing, China. [2]Siemens Shenzhen Magnetic Resonance Ltd., Beijing, China.