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Meeting abstract

1142 A new approach towards improved visualization of myocardial edema using T2-weighted imaging

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Background

Imaging edema with T2-weighted STIR (Short T1 Inversion Recovery) often results in poor image quality due to low signal-to-noise ratio (SNR) and cardiac motion sensitivity. An alternative option is to image with AASPIR (Asymmetric Adiabatic Spectral Inversion Recovery) [1,2] turbo spin echo (TSE). Non-selective spectral excitation of only the fat signal may improve SNR and reduce motion sensitivity. Therefore, we assessed image quality and signal intensity of AASPIR compared with STIR for cardiovascular magnetic resonance (CMR) imaging of the myocardium.

Methods

We studied 30 patients (21 males, 46 ± 17 years), referred for cardiovascular magnetic resonance scans for myocardial tissue characterization using both STIR and AASPIR preparations for T2-weighted TSE imaging. All images were acquired with a 1.5 T scanner (Avanto, Siemens Medical Solutions, Erlangen, Germany). Image acquisition was performed in basal and mid-ventricular short axis slices, and apical slices were acquired only if good image quality could be obtained. Signal intensity (SI) of left ventricular myocardium was normalized to skeletal muscle, generating a T2 signal intensity ratio (SIR). Moreover, the SI of myocardium was related to noise, as defined by the mean SI of a region of interest anterior to the chest wall, generating a SNR. Two independent observers assessed image quality and artifact suppression using a 5-class score system.

Results

AASPIR showed a higher SNR for basal (42.4 vs. 27.0, $p < 0.001$), and mid- (52.8 vs. 31.2, $p < 0.001$), and apical (55 vs. 27.0, $p < 0.001$) ventricular myocardium (Figure 1), a higher image quality and a more consistent suppression of artifacts (Figure 2). SIR did not differ between STIR and AASPIR imaging (1.633 vs. 1.626, $p = 0.845$).

Conclusion

Our findings support the implementation of an AASPIR instead of a STIR sequence for T2-weighted CMR imaging, with increased SNR, and improved image quality.

References

1. Rosenfeld D, *et al.*: *Magn Reson Med* 1997, **37:**793-801.
2. Shea SM, *et al.*: *ISMRM* 2007:2475.

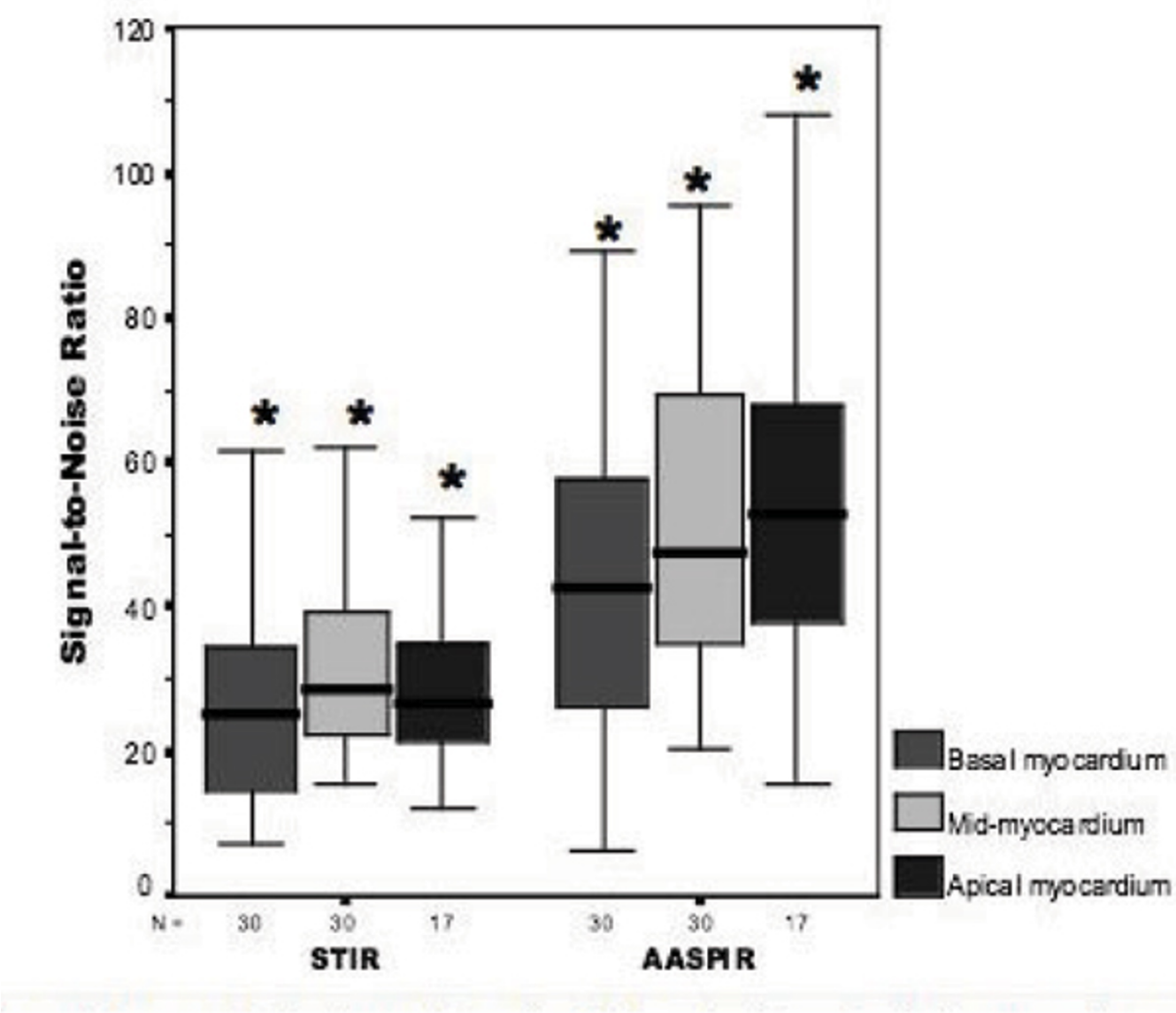

Figure 1
Imrpoved signal-to-noise ratios for basal, mid- and apical myocardium with AASPIR T2-weighted imaging. *$p \leq 0.05$.

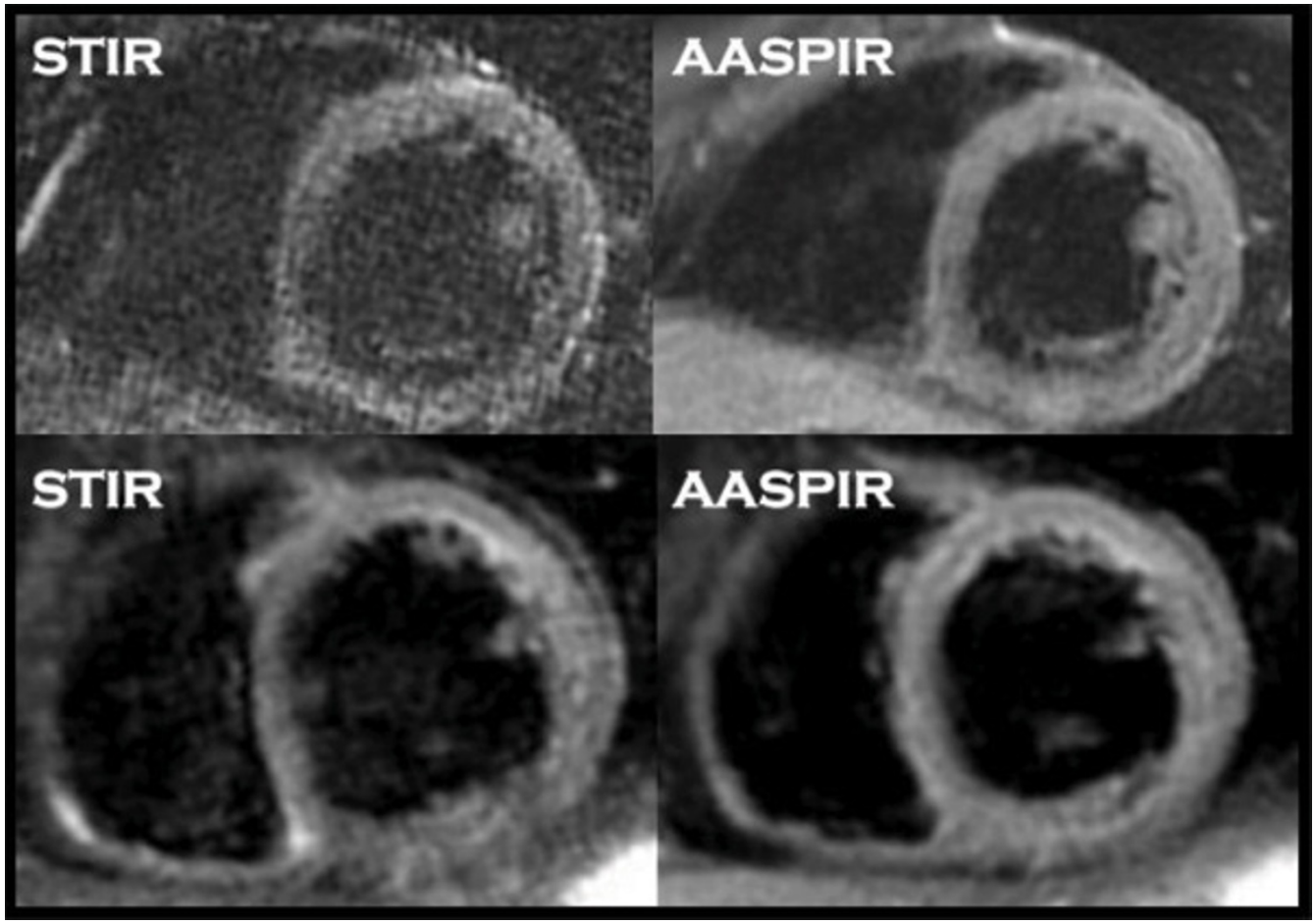

Figure 2
Improved image quality with T2-weighted AASPIR imaging compared to STIR.