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Myocardial perfusion MRI using SW-CG-HYPR for the detection of coronary artery disease

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Summary

In this work, we have prospectively examined the diagnostic value of adenosine-induced stress myocardial perfusion MRI using SW-CG-HYPR in 50 patients with suspected CAD. Using the high-resolution, whole left ventricle SW-CG-HYPR method, perfusion MRI was able to depict hemodynamically relevant coronary artery stenosis with an accuracy of 90% and 93% based on per-patient and per-vessel analyses, respectively, using x-ray coronary angiography as the reference standard.

Background

Myocardial perfusion MRI with SW-CG-HYPR allows increased spatial coverage (whole left ventricular coverage), improved temporal and spatial resolution and signal-to-noise ratio, and reduced motion artifacts. The accuracy of this technique for detecting coronary artery disease (CAD) has not been determined in a large number of patients. The purpose of this study was to prospectively evaluate the diagnostic performance of myocardial perfusion MRI with SW-CG-HYPR in patients with suspected CAD.

Methods

Fifty consecutive patients (28 men and 22 women; mean age, 56 ± 16 years) who were scheduled for coronary angiography with suspected CAD underwent myocardial perfusion MRI with SW-CG-HYPR at 3.0T. Perfusion defects were interpreted qualitatively by 2 blinded observers and were correlated to x-ray angiographic stenoses ≥ 50%.

Results

The prevalence of CAD was 56%. In the per-patient analysis, the sensitivity, specificity, positive predictive value, negative predictive value, and accuracy of SW-CG-HYPR myocardial perfusion imaging were 96% (95% confidence interval [CI] 82% to 100%), 82% (95% CI 60% to 95%), 87% (95% CI 70% to 96), 95% (95% CI 74% to100%), and 90% (95% CI 82% to 98%), respectively. In the per-vessel analysis, these values were 98% (95% CI 91% to 100%), 89% (95% CI 80% to 94%), 86% (95% CI 76% to 93%), 99% (95% CI 93% to 100%), and 93% (95% CI 89% to 97%), respectively.

Conclusions

Myocardial perfusion MRI using SW-CG-HYPR allows whole left ventricular coverage and high resolution, and has high diagnostic accuracy in patients with suspected CAD.

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