

POSTER PRESENTATION

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Adenosine-perfusion at 1.5 Tesla is superior to 3 Tesla for the detection of coronary artery disease

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Background

To compare a compiled clinical routine cardiac magnetic resonance imaging (CMR) protocol performed at both 1.5-T and 3.0-T in patients with suspected coronary artery disease (CAD) undergoing coronary x-ray angiography.

CMR including adenosine perfusion and late gadolinium enhancement (LGE) at 1.5-T has been established for non-invasive detection of relevant CAD. However, little is known about the potential advantages of 3.0-T to detect CAD.

Methods

Fifty-two evaluable patients (62.3 ± 10.2 years) were included into the study. All patients were scanned at both 1.5-T and 3.0-T including adenosine stress and rest

perfusion, and LGE imaging. CMR images were analyzed by two blinded readers in consensus. A significant CAD was diagnosed by quantitative coronary analysis.

Results

Diagnostic accuracy of the combined analysis of perfusion and LGE imaging yielded better values at 1.5-T and 3.0-T than the analysis of perfusion images alone. Specificity and sensitivity at 3.0-T was superior to 1.5-T in detecting coronary stenoses $\geq 50\%$ (90% vs.75% and 84.4% vs.75%) and $\geq 70\%$ (88% vs. 80% and 96.3% vs. 88.9%).

Conclusions

This study showed that CMR at 3.0-T in a routine clinical setting is superior to 1.5-T in detection of significant

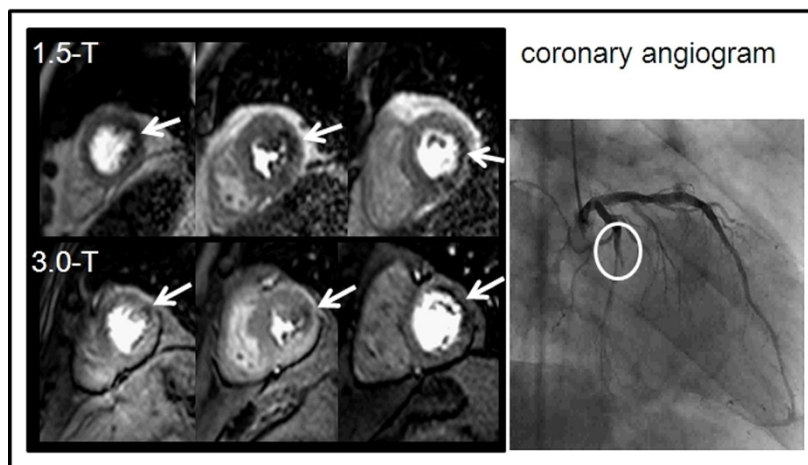


Figure 1 Example of an adenosine perfusion CMR examination at 1.5-T and 3.0-T revealing a lateral wall perfusion deficit (arrows) consistent with an occlusion of the LCX (circle) as seen on coronary angiogram.

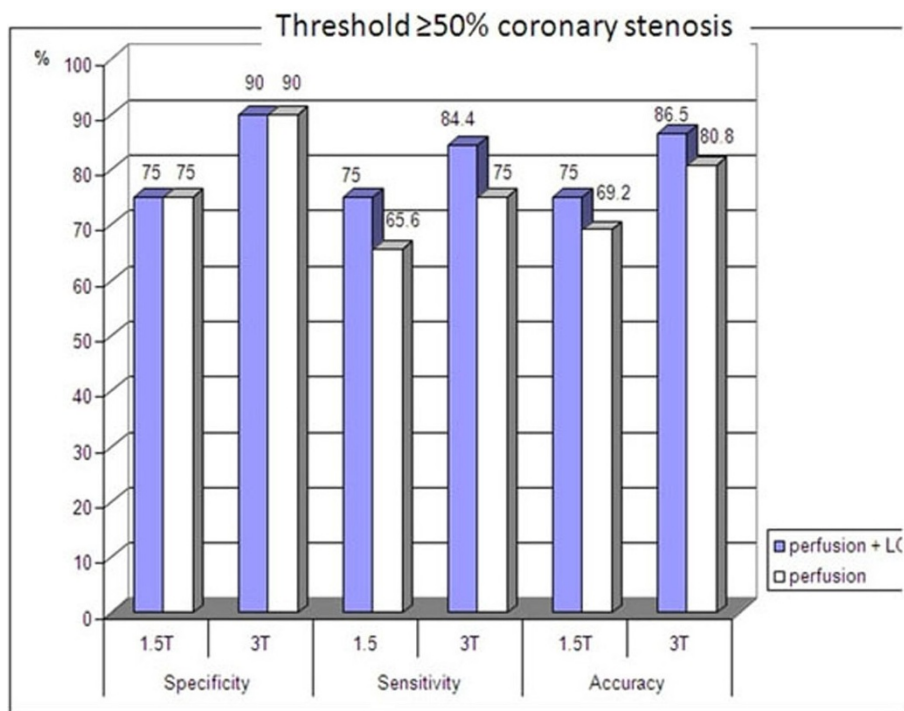


Figure 2 Bar diagram comparing both analysis algorithms (perfusion vs. perfusion + LGE analysis) and both field strengths (1.5 vs. 3 T) for diagnostic accuracy regarding a threshold of $\geq 50\%$ coronary artery stenosis.

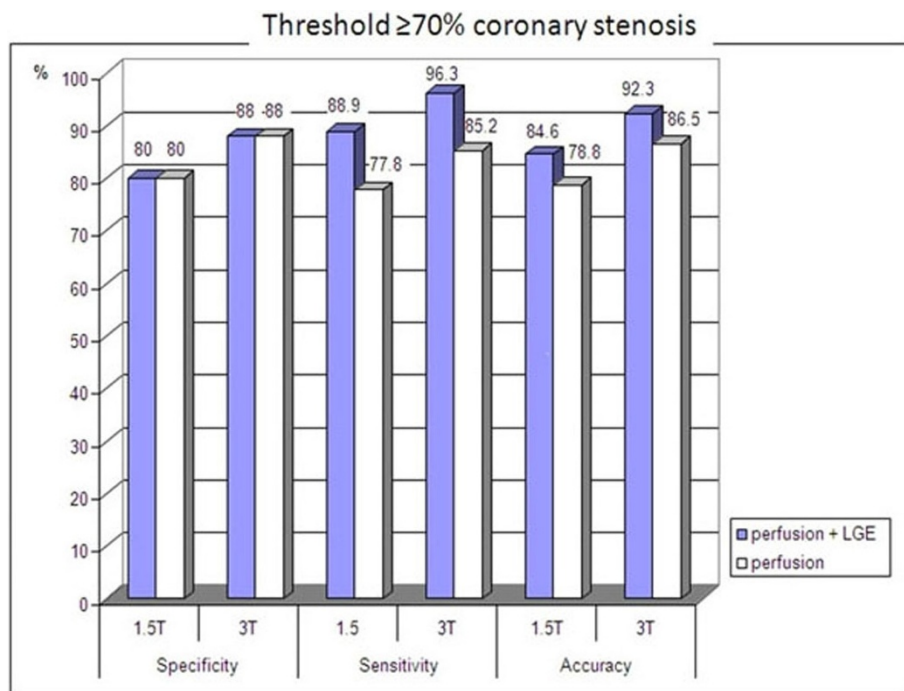


Figure 3 Bar diagram comparing both analysis algorithms (perfusion vs. perfusion + LGE analysis) and both field strengths (1.5 vs. 3 T) for diagnostic accuracy regarding a threshold of $\geq 70\%$ coronary artery stenosis

CAD. 3.0-T might become the preferred CMR field strength for evaluation of CAD in clinical practice.

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