

WORKSHOP PRESENTATION

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3 Tesla is the preferred field strength for perfusion imaging in coronary artery disease – a comparison to 1.5 Tesla and fractional flow reserve

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Background

Adenosine perfusion imaging at 1.5 Tesla (T) has been shown to yield good diagnostic values in comparison to quantitative coronary angiography. Perfusion imaging at 3 T has the potential benefit of higher contrast- and signal-to-noise ratios. However, little is known about diagnostic performance of 3 T perfusion imaging in comparison to 1.5 T and in comparison to invasive measurement of fractional flow reserve (FFR). We sought to evaluate visual and quantitative assessment of adenosine perfusion at 3 T in comparison to 1.5 T and to coronary angiography in patients presenting with suspected coronary artery disease (CAD).

Methods

86 consecutive patients with suspected CAD were enrolled in this study. All patients underwent adenosine perfusion at 3 T (Achieva, Philips Medical Systems) and 1.5 T (Intera, Philips Medical Systems) within 72 hours with subsequent coronary angiography within 72 hours. Two independent patient groups were formed. In group 1 1 (N=52) quantitative coronary analysis (QCA) was compared to qualitative perfusion MRI imaging. Group 2 (N=34) underwent FFR measurement in all three major coronary arteries in comparison to quantitative myocardial perfusion reserve (MPR).

Results

In both groups a significant ($p < 0.05$) higher sensitivity and specificity (group 1: 0.88 vs 0.80 and 0.96 vs. 0.89,

$p < 0.01$; group 2 0.91 vs. 0.62 and 1.0 vs. 0.77, $p < 0.001$) was found for 3 T when compared to 1.5 T.

Conclusions

3 T appears to be the superior field strength for visual or quantitative analysis of myocardial perfusion in CAD as shown in our two consecutive patient groups.

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