

MRI in CT in the diagnosis of coronary artery disease indication and application

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Recently, the first results of stress perfusion CT have also been published. Many of these imaging methods have been reported to yield a high negative predictive value, i.e. a normal result of these tests rules out a haemodynamically significant CAD with a high probability. For a reasonable implication of imaging strategies in clinical practice, however, the pre-test probability must be considered to avoid needless examinations [1]. High pre-test probability invariably demands invasive coronary angiography for planning or performing revascularisation therapy. Intermediate pre-test probability, on the contrary, justifies deferring further imaging studies, if MRI and/or CT are/is normal. Cardiac MRI has matured into a multipurpose noninvasive imaging tool for the assessment of ischaemic cardiomyopathy. The breadth of applications possible with cardiac MRI allows combined non-invasive assessment of myocardial perfusion, function and myocardial viability—a task that usually requires use of myocardial scintigraphy and echocardiography. As such, cardiac MRI currently holds a strong position in the non-invasive work-up of patients with CAD. The distinct advantages of MRI over current conventional nuclear-based cardiac-imaging techniques, such as PET or myocardial scintigraphy, include its high spatial resolution and lack of exposure of the patient to ionising radiation. Also, quantification of cardiac morphology and function by MRI is more accurate and image quality is more reproducible than in echocardiography, independent of the operator's experience and skill level or the patient's anatomy.

The review and outlook presented here will focus on three major aspects of non-invasive MR and CT imaging in the diagnosis of CAD. The first part describes the clinical value of contrast-enhanced non-invasive CT coronary angiography, including the diagnostic accuracy of CT coronary angiography for the exclusion or detection of significant CAD with coronary artery stenoses that may require angioplastic intervention, as well as potentially valuable information on the coronary artery vessel wall. In the second section, the potential of CT for imaging of myocardial viability and perfusion will be highlighted. In the third and final part, the range of applications of cardiac MRI in CAD patients will be outlined. Not all the imaging methods described in this review are already

being used in the daily clinical work-up of patients with CAD, but they are being used more and more every day. Therefore, their correct clinical indication and clinical value need to be discussed.