

Cardiac MR Today & Tomorrow: Coronary Artery & Vessel Wall Imaging Clinical Applications of Coronary MRA

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- Coronary MRA is ideally suited for noninvasive detection and size measurement of coronary artery aneurysms in patients with Kawasaki disease, and for detecting anomalous coronary arteries and delineating proximal courses of the vessels.
- Because the specificity and negative predictive value of coronary CTA to detect obstructive CAD are substantially reduced in patients with severe coronary calcification (calcium score of ≥ 600), coronary MRA can be used as a good alternative to coronary CTA in patients with high calcium score.
- A recent study demonstrated that coronary MRA is useful for predicting the future risk for cardiac events in patients with suspected CAD.

Coronary MRA has several advantages over coronary CT angiography [1,2]. First, coronary MRA does not expose the patients to ionizing radiation. Second, in patients with renal insufficiency, coronary arteries can be assessed without administration of contrast medium. Third, the lumen of the coronary artery can be visualized in patients with heavy coronary artery calcification. Consequently, the use of coronary MRA is recommended for assessing (1) coronary artery aneurysms in Kawasaki disease, (2) anomalous coronary arteries, and (3) obstructive CAD in patients with severe coronary calcification and those with renal insufficiency.

Several CT studies demonstrated that the presence of stenosis on coronary CTA has a significant prognostic impact on the prediction of cardiac events. However, the prognostic value of coronary MRA has not been investigated. In our recent study using 1.5T non-contrast enhanced whole-heart coronary MRA in 207 patients with suspected CAD, the frequency of all cardiac events was significantly higher in patients with significant stenosis in comparison with those without significant stenosis (11.9% vs. 0.8% during a median follow-up period of 25 months, $p < 0.001$) [3]. In addition, the absence of significant stenosis on coronary MRA can identify a population with a very low risk for severe cardiac events (0%) and all cardiac events (0.3%), indicating that coronary MRA is quite useful in the risk stratification of patients with suspected CAD.

References

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2. Nagata M, Sakuma H, et al. Radiology, 2011;259: 384–392
3. Yoon Y, Sakuma H, et al. J Am Coll Cardiol, 2012;60:2316-2322