

Poster presentation

Endocardial extent by contrast enhanced cardiac magnetic resonance imaging is not an accurate method for assessing myocardium at risk; validation with T2-weighted cardiac magnetic resonance imaging

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Introduction

In the situation of acute coronary occlusion, the myocardium supplied by the occluded vessel is subject to ischemia and is referred to as the myocardium at risk (MaR). It has previously been shown that cardiac magnetic resonance (CMR) imaging can be used for the assessment of MaR employing a T2-weighted edema sequence. Recently, it has been suggested that the endocardial extent of hyperenhancement as assessed by contrast enhanced CMR can also be used to quantify the MaR.

Purpose

We sought to assess the ability of endocardial extent by contrast enhanced CMR to quantify MaR in relation to T2-weighted edema imaging.

Methods

Thirty-six patients with early reperfused first-time ST-segment elevation myocardial infarction underwent CMR imaging within 7 days after percutaneous coronary intervention. The MaR was determined by contrast enhanced endocardial extent and compared to the MaR as determined by T2-weighted edema imaging.

Results

The MaR was $34 \pm 10\%$ (range 16-59) and $24 \pm 12\%$ (range 0-66) of the left ventricle by T2-weighted edema imaging and contrast enhanced endocardial extent, respectively. Comparison of the two methods yielded a weak correlation ($r^2 = 0.26$, $p = 0.002$) with a bias of $-10 \pm 11\%$ (Figure 1). The MaR was consistently larger than the final infarct size ($14 \pm 10\%$, range 0-47), which resulted in a myocardial salvage of $57 \pm 21\%$ (range 12-100).

Conclusion

This study demonstrated that the endocardial extent as assessed by contrast enhanced CMR is not an accurate method for the assessment of MaR in patients with early reperfusion, using T2-weighted edema imaging as reference method.

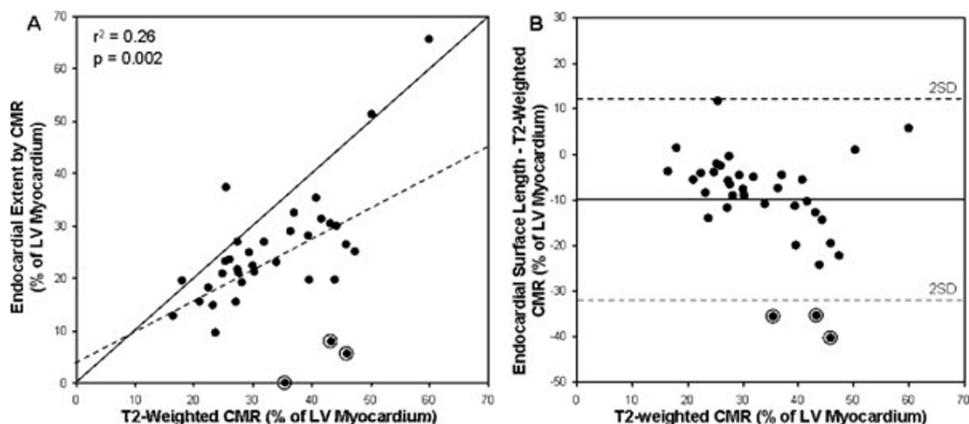


Figure 1

Agreement between contrast enhanced endocardial extent and T2-weighted CMR. (A) The MaR determined by contrast enhanced endocardial extent versus the MaR as determined by T2-weighted CMR. Solid line = line of identity; dashed line = regression line. (B) Bland-Altman graph showing the difference between contrast enhanced endocardial extent and T2-weighted CMR. Solid line = mean difference; dashed lines = $\pm 2SD$. Patients with an aborted infarction of myocardial salvage over 90% are presented as encircled dots.

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