Journal of Cardiovascular Magnetic Resonance

Poster presentation

Myocardium at risk with contrast enhanced SSFP compared to myocardial perfusion SPECT

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from 13th Annual SCMR Scientific Sessions
Phoenix, AZ, USA. 21-24 January 2010

Published: 21 January 2010

Journal of Cardiovascular Magnetic Resonance 2010, **12**(Suppl 1):P119 doi:10.1186/1532-429X-12-S1-P119

This abstract is available from: http://jcmr-online.com/content/12/S1/P119

Introduction

Final infarct size following coronary occlusion is determined by the duration of ischemia, the size of myocardium at risk (MaR) and reperfusion injury. The reference method for determining MaR, single-photon emission computed tomography (SPECT) imaging before reperfusion, is impractical in an acute setting.

Purpose

The aim of the present study was to evaluate whether MaR can be determined from the contrast enhanced myocardium on steady-state free precession (SSFP) performed one week after the acute event in patients with ST-elevation myocardial infarction (STEMI).

Methods

Sixteen patients with STEMI (age 64 ± 8 years) received intravenous 99 m-Tc immediately before primary percutaneous coronary intervention. A SPECT investigation was performed within four hours. MaR was defined as the non-perfused myocardial volume on SPECT. Magnetic resonance imaging (MRI) was performed 7.8 ± 1.2 days after the myocardial infarction using a protocol in which the contrast agent was administered before acquisition of short-axis cine images. MaR was evaluated as the contrast enhanced myocardial volume in cine SSFP by two blinded observers.

Results

MaR determined from the enhanced region on cine SSFP correlated significantly with that derived with SPECT (r^2 = 0.78, $p < 0.001$). The difference in MaR determined by MRI and SPECT was 0.5 ± 5.1% (mean ± SD). The inter-observer variability of contrast enhanced cine SSFP measurements was 1.6 ± 3.7% (mean ± SD) of the left ventricle wall volume Figures 1 and 2.

Conclusion

This study suggests that contrast enhanced cine SSFP performed one week after reperfusion can serve as a novel imaging method to quantify MaR as it was before reperfusion.

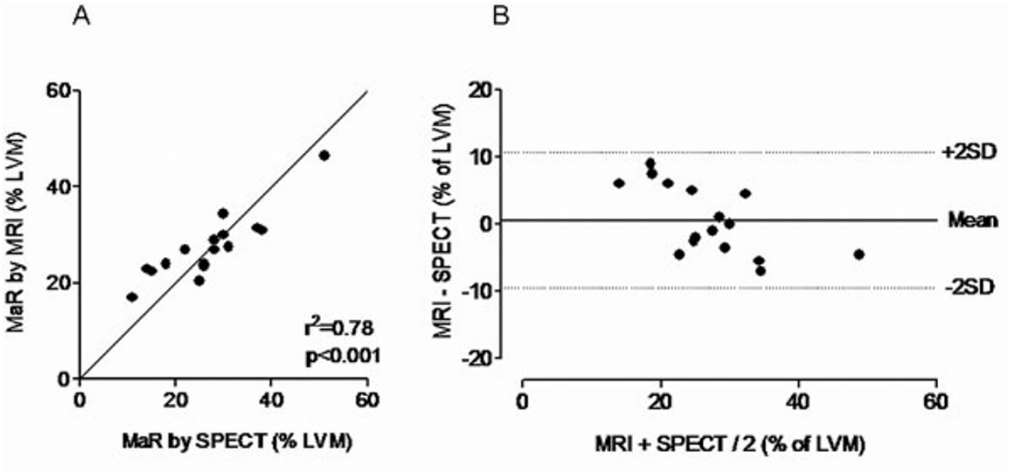

Figure 1

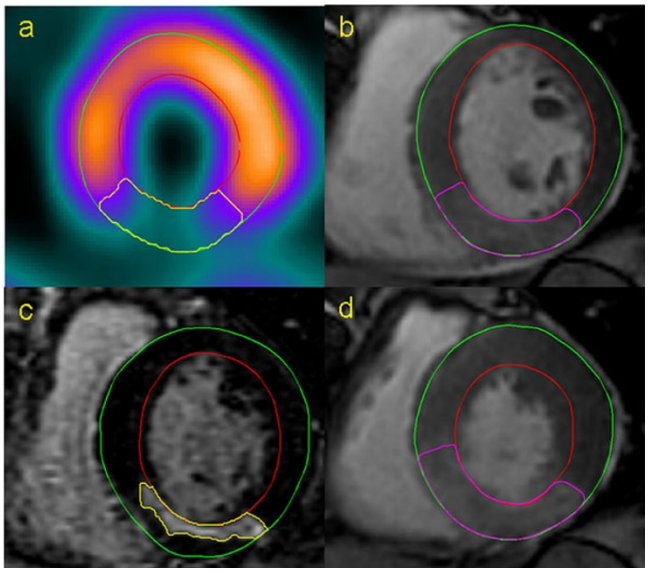

Figure 2