OBJECTIVES: The aim of this research was to evaluate kinetics and extent of myocardial contrast enhancement (CE) in comparison with single-photon emission computed tomography (SPECT) early after acute myocardial infarction (AMI).

BACKGROUND: Quantification of infarct size serves as a surrogate end point in evaluating new therapies of AMI. Contrast-enhanced magnetic resonance imaging (CeMRI) of the myocardium is a promising new method for identification of irreversible tissue injury. METHODS: A total of 33 patients were examined by CeMRI and SPECT 7 +/- 2 days after AMI and successful coronary intervention. After gadolinium-diethylenetriamine pentaacetic acid injection (0.2 mmol/kg), continuous short-axis slices of the left ventricle (LV) were acquired every 7 min up to 42 min using different inversion times (TI). Myocardial CE at each imaging time point was quantified and compared with corresponding SPECT perfusion defect. RESULTS: All patients showed myocardial CE in the infarct region. A constant TI for CeMRI resulted in a decrease of signal intensity and extent of CE on late acquisitions. With TI adjustment, infarct image intensity peaked at 21 min with a contrast of 478% of remote myocardium and remained at this level up to 42 min after contrast injection (437%); CE...
extent was stable over time and agreed well with SPECT within an average difference of 3% of the LV myocardium, yielding the best correlation at 28 min (r = 0.86). CONCLUSIONS: In patients after AMI and successful reperfusion, CE is stable over time and matches well with SPECT perfusion defect; CeMRI under standardized conditions can accurately assess myocardial infarct size in vivo and may be attractive for serving as a surrogate end point early after AMI.