Acute myocardial infarction: serial cardiac MR imaging shows a decrease in delayed enhancement of the myocardium during the 1st week after reperfusion.

PURPOSE: To evaluate the time course of delayed gadolinium enhancement of infarcted myocardium by using serial contrast agent-enhanced (CE) cardiac magnetic resonance (MR) images obtained during the acute, subacute, and chronic stages of infarction.

MATERIALS AND METHODS: The study protocol was reviewed and approved by the local ethics committee, and written informed consent was obtained. Seventeen patients with reperfused acute myocardial infarction (AMI) underwent cine and CE cardiac MR a median of 1, 7, 35, and 180 days after reperfusion. Infarct size determined on the basis of delayed enhancement MR imaging at different times was compared by using nonparametric tests and Bland-Altman analysis. Extent of myocardial enhancement was compared with single photon emission computed tomographic (SPECT) measures of infarct size with Spearman correlation. Regional myocardial enhancement extent and contractility were analyzed with nonparametric tests. RESULTS: Infarct size was 18.3% of total myocardial LV volume on day 1 after AMI and decreased to 12.9% on day 7, 11.3% on day 35, and 11.6% on day 180 (all P<.001). Estimated infarct size on day 7, as compared with day 1 enhancement size, declined by 57.1% within the
epicardium and by 6.3% within the endocardium (both P < .001). Infarct size on day 7 showed only
minor changes at subsequent imaging and yielded a high correlation with SPECT measurements of
infarct size (r = 0.84). Infarct size on day 7 inversely correlated with long-term wall thickening (P <
.0001) and allowed prediction of contractile function. CONCLUSION: In patients with AMI and
successful coronary reperfusion, the size of delayed gadolinium enhancement at CE cardiac MR
imaging significantly diminished during the 1st week after infarction. Thus, timing of CE cardiac MR
imaging is crucial for accurate measurement of myocardial infarct size early after AMI.