



Three-dimensional MRI assessment of regional wall stress after acute myocardial infarction predicts postdischarge cardiac events

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Résumé en anglais

PURPOSE: To determine the prognostic significance of systolic wall stress (SWS) after reperfused acute myocardial infarction (AMI) using MRI. **MATERIALS AND METHODS:** A total of 105 patients underwent MRI 7.8 +/- 4.2 days after AMI reperfusion. SWS was calculated by using a three-dimensional (3D) MRI approach to left ventricular (LV) wall thickness and to the radius of curvature. Between hospital discharge and the end of follow-up, an average of 4.1 +/- 1.7 years after AMI, 19 patients experienced a major cardiac event, including cardiac death, nonfatal reinfarction or heart failure (18.3%). **RESULTS:** The results were mainly driven by heart failure outcome. In univariate analysis the following factors were predictive of postdischarge major adverse cardiac events: 1) at the time of AMI: higher heart rate, previous calcium antagonist treatment, in-hospital congestive heart failure, proximal left anterior descending artery (LAD) occlusion, a lower ejection fraction, higher maximal ST segment elevation before reperfusion, and ST segment reduction lower than 50% after reperfusion; 2) MRI parameters: higher LV end-systolic volume, lower ejection fraction, higher global SWS, higher SWS in the infarcted area (SWS MI) and higher SWS in the remote myocardium (SWS remote). In the final multivariate model, only SWS MI (odds ratio [OR]: 1.62; 95% confidence interval [CI]: 1.01-2.60; P = 0.046) and SWS remote (OR: 2.17; 95% CI: 1.02-4.65; P = 0.046) were independent predictors. **CONCLUSION:** Regional SWS assessed by means of MRI a few days after AMI appears to be strong predictor of postdischarge cardiac events, identifying a subset of at risk patients who could qualify for more aggressive management.

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