

# Value of 3-dimensional speckle tracking echocardiography in the prediction of cardiovascular events in patients with hypertension complicated by acute myocardial infarction: a long-term follow-up study

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## Abstract

**Background** Patients with hypertension complicated by acute myocardial infarction (AMI) have a poor prognosis. Identification of powerful predictors of recurring cardiovascular events (RCEs) is very important. This study sought to evaluate the predictive value of three-dimensional (3D) strain parameters for RCEs in patients with hypertension complicated by AMI. **Methods** We successfully followed up 62 patients with hypertension and AMI. Participants underwent three-dimensional echocardiography before, one week after, and one month after percutaneous coronary intervention (PCI). Left ventricular (LV) structural function parameters and three-dimensional strain parameters (3-dimensional global longitudinal strain (3D-GLS), 3-dimensional global circumferential strain (3D-GCS), 3-dimensional global radial strain (3D-GRS), and 3-dimensional global area strain (3D-GAS)) were acquired. We used a Cox model to determine the relationships between these parameters and RCEs. **Results** During follow-up ( $41.27 \pm 20.45$  months), 20 patients (32.8%) had RCEs, which were independently predicted one month after PCI by 3D-GLS (HR: 1.481, 95%CI: 1.202-1.824) and 3D-GAS (HR: 1.254, 95%CI: 1.093-1.440). The optimal 3D-GLS and 3D-GAS cutoffs for predicting cardiac events were  $>-12.5\%$  [area under the receiver operating characteristic curve (AUC) 0.736, 95%CI 0.611-0.862,  $P=0.003$ ] and  $>20.5\%$  (AUC 0.685, 95%CI 0.551-0.818,  $P=0.020$ ), respectively. Using logistic regression analysis, we constructed joint predictor  $= (3D-GLS) + (3D-GAS) \times 0.303/0.558$ , and its cutoff point was  $-22.36\%$  (AUC 0.829, 95%CI 0.722-0.937,  $P<0.001$ ). **Conclusions** 3D-GLS and 3D-GAS assessed one month after PCI can predict RCEs in patients with hypertension complicated by AMI. Additionally, the predicted value of  $(3D-GLS) + (3D-GAS) \times 0.303/0.558$  was higher than the predicted value of either parameter alone.

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