EARLY GADOLINIUM ENHANCEMENT ON CARDIAC MRI IS USEFUL TO DETECT IMPAIRED REGIONAL FUNCTIONAL RECOVERY AND REMODELING OF LEFT VENTRICLE IN PATIENTS WITH ACUTE MYOCARDIAL INFARCTION

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Authors: Michitomo Kawahito, Shingo Ota, Tomomasa Takamiya, Yoichi Tsutano, Norio Kanamori, Ryota Matsuoka, Makoto Araki, Hitoshi Tanio, Makoto Kondo, Ryuichi Hattori, Takeshi Aoyama, Shimada Municipal Hospital, Shizuoka, Japan

Background: Late gadolinium enhancement (LGE) by cardiac MRI (CMR) is well known to be useful predictor of myocardial viability in patients with acute myocardial infarction (AMI). However, the role of early gadolinium enhancement (EGE) on the functional recovery of left ventricle (LV) has not been determined. The aim of this study was to determine the utility of EGE on the regional functional recovery and remodeling in patients with AMI.

Methods: We enrolled 123 patients (63+/-12 years) with first AMI who had LGE more than 50% transmural extent examined by CMR at the sub-acute phase (7.8+/-5.6 days). We examined rest myocardial perfusion defect (PD) on EGE image and ring-shaped enhancement (RE) on LGE image. We performed reperfusion therapy for each patient immediately after arrival in our hospital and left ventriculography (LVG) at the acute and chronic phases (6 months after the onset). Regional wall motion score index (RWMSI) in infarct-related area was calculated from LVG at the acute and chronic phases by using 5 points scoring scale (0: normal, 1: hypokinesis, 2: severe hypokinesis, 3: akinesis, 4: dyskinesis/aneurysm). We defined the decrease from acute to chronic phase as Delta-RWMSI. We also assessed the amount of increase in end-diastolic volume index (Delta-EDVI).

Results: Delta-RWMSI in patients without RE (n=84) was significantly improved compared to that with RE (n=39) (1.0+/-1.0 vs. 0.4+/-1.0; p=0.0029). Delta-RWMSI in patients without PD (n=54) was significantly improved compared to that with PD (n=69) (1.1+/-1.1 vs. 0.5+/-0.9; p=0.0023). Delta-EDVI in patients with RE was tend to be higher than that without RE (11.6+/-19.0 vs. 4.2+/-20.1 mm3/m2; p=0.0701). Delta-EDVI in patients with PD was significantly higher than that without PD (10.9+/-21.4 vs. 1.2+/-17.0 mm3/m2; p=0.0096). Thirty patients (43%) among 69 patients with PD did not have RE. Whereas all patients with RE had PD.

Conclusions: EGE imaging is useful to detect impaired regional functional recovery and LV remodeling in patients with AMI. Perfusion defect indicates the "no-reflow" on reperfused myocardium. We consider that no-reflow by CMR is more important on prediction of LV remodeling than myocardial central necrosis.