

## Quantification of Regional Functional Improvement of Infarcted Myocardium after primary-PTCA by Contrast-Enhanced Magnetic Resonance Imaging

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### BACKGROUND:

This study sought to assess the relationship between delay and improvement of regional left ventricular function after primary angioplasty (p-PTCA) for acute myocardial infarction (AMI) with cardiac magnetic resonance imaging (CMR).

### METHODS:

We performed cine-CMR and T1-weighted late-enhancement (LE) sequences in 40 patients with first AMI shortly after restoring TIMI 3 flow with p-PTCA and four months thereafter. Infarcted segments were determined from LE short-axis images. Regional left ventricular function was quantified from short-axis cine-CMR images. Segmentation followed the AHA 17-segments model. Patients were divided into groups with delay <3 h (group 1), delay 3-6 h (group 2), delay 6-12 h (group 3) and a group with chronic infarcts (delay >12).

### RESULTS:

Out of 640 evaluated segments 335 (52%) showed LE (infarcted) and consecutively impaired regional function in terms of systolic wall thickening (SWT,  $49\pm 2\%$  vs.  $60\pm 2\%$  in uninfarcted;  $p<0.01$ ). Baseline SWT was not significantly different between infarcted segments after reperfusion with respect on the duration of ischemia. Paired Wilcoxon rank test revealed significant improvement of SWT only in segments reperfused within 6 hours ( $p<0.001$ ). Follow-up SWT was significantly higher if segments were reperfused early (<3h:  $74\pm 4\%$ , 3-6h:  $57\pm 4\%$ , 6-12h:  $48\pm 7\%$ , <3 to 3-6:  $p<0.003$  and <3 to 6-12h:  $p<0.001$ ). The amount of improvement was higher if delay was <3 h compared to segments with a delay of >3h (<3h:  $+21\pm 3\%$ , 3-6h:  $+8\pm 4\%$ , 6-12h:  $+6\pm 3\%$ ; <3h to 3-6h and 6-12h,  $p<0.02$ ).

### CONCLUSION:

We could quantitatively demonstrate for the first time that time to p-PTCA treatment significantly influences regional functional recovery of infarcted myocardium after a four months follow-up.