OBJECTIVES: We sought to quantify the myocardium at risk in reperfused acute myocardial infarction (AMI) in man with T2-weighted (T2W) cardiac magnetic resonance (CMR).

BACKGROUND: The myocardial area at risk (AAR) is defined as the myocardial tissue within the perfusion bed distally to the culprit lesion of the infarct-related coronary artery. T2W CMR is appealing to retrospectively determine the myocardial AAR after reperfused AMI. Data on the utility of this technique in humans are limited.

METHODS: One hundred eight patients with successfully reperfused ST-segment elevation AMI were studied between 1 and 20 days after percutaneous coronary intervention (PCI). We compared the volume of hyperintense myocardium on T2W CMR with the myocardial AAR determined by contrast-enhanced CMR with infarct endocardial surface length (ESL) and AAR estimated by conventional coronary angiography with the BARI (Bypass Angioplasty Revascularization Investigation) risk score.

RESULTS: The volume of hyperintense myocardium on T2W CMR (mean 32 +/- 16%, range 3% to 67%) was consistently larger than the volume of myocardial infarction measured with contrast-enhanced images (mean 17 +/- 12%, range 0% to 55%) (p< 0.001). Myocardial salvage ranged from -4% to 45% of the left ventricular myocardium (mean 14 +/- 10%). The AAR determined by...
T2W CMR compared favorably with the infarct ESL (r = 0.77) with contrast-enhanced CMR, and there was moderate correlation between the BARI angiographic risk score and infarct ESL (r = 0.42). The time between PCI and CMR did not cause a significant difference in the volume of T2W hyperintense myocardium (r = 0.11, p = 0.27) or the calculated volume of salvaged myocardium (r = 0.12, p = 0.23).

CONCLUSIONS: T2W CMR performed early after successfully reperfused AMI in humans enables retrospective quantification of the myocardial AAR and salvaged myocardium.

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