

ORIGINAL ARTICLE

Ventricular Function

Left Ventricular Remodeling Subsequent to Reperfused Myocardial Infarction: Evaluation of a Rat Model Using Cardiac Magnetic Resonance Imaging

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ABSTRACT

Purpose: This study characterized the time course of ventricular remodeling subsequent to reperfused myocardial infarction (MI) in a rat model using cardiac magnetic resonance (MR) imaging.

Methods and Results: Short axis cine MR imaging was used to measure left ventricular ejection fraction (LVEF) and left ventricular volumes in Lewis rats at baseline, 1, 2, 4, 6, 8, and 10 weeks post-MI. Ventricular pressure and myocardial mass were evaluated at the 10 week time point.

Results: Measurements of LVEF showed a significant decrease in cardiac function immediately after MI with no significant changes over the remainder of the time course. Measurements of left ventricular end-systolic volume (LVESV) showed significant increases over the first 4 weeks after MI with no significant changes over the remainder of the time course. Statistical analysis of the MR measurements of LVESV yielded a repeatability standard error of 3.3%, an inter-observer standard error of 3.3%, and an intra-observer standard error of 1.6%.

Conclusion: This study indicates that cine MRI can be used to longitudinally evaluate changes in ventricular structure and function in a rat model of left ventricular remodeling. In this animal model, preliminary results indicate that the majority of remodeling is completed by 4 weeks and no significant changes in LVEF

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