USING HIGH-TEMPORAL-RESOLUTION (HTR) MRI METHOD TO ANALYZE THE LEFT VENTRICULAR FUNCTION OF A DIABETIC RAT MODEL

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High-temporal-resolution (HTR) cardiac cine-magnetic resonance imaging (MRI) is a novel technique which provides much more image frames during one cardiac cycle than conventional cardiac cine-MRI method. Subtle alterations and features of diseased heart below the limitation of detection of conventional cardiac cine-MRI technique can be exposed by the more detailed left ventricular (LV) volume curve provided by HTR cine-MRI. In this study, we applied this technique to a diabetic rat model and acquired 40 image frames for a long-axis LV view and a mid-ventricular short-axis LV view, respectively, through a single cardiac cycle for each sample. LV volume was measured based on these frames with semi-automatic software called Segment. The LV diastolic filling rates and systolic ejection rates were analyzed and compared with the results obtained using conventional cine-MRI. The initial result of this study revealed two peak filling rates during diastolic relaxation phase which cannot be differentiated using conventional cardiac MRI. Further investigations are ongoing to explore the potentials of this technique in evaluation of cardiac functions in small animal models of heart disease.