

Meeting abstract

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1116 Clinical usefulness of semiautomatic diastolic functional analysis based on multi-slice and multi-phase short axis(SA) cardiac cine MRI

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Introduction

Diastolic dysfunction account for 40% of cause of heart failure. Therefore, Diastolic functional analysis is important on clinical application. Conventionally, the diastolic left-ventricular functional analysis is performed with Doppler echo or nuclear medicine imaging. Although cardiac MRI can also evaluate the diastolic function with volumetric analysis, it is time-consuming work with manual trace of all data set.

Purpose

To evaluate the accuracy of semiautomatic diastolic functional analysis based on conventional cardiac cine MR images in comparison with Doppler echocardiography and velocity-encoded (VE) cine MRI.

Methods

We examined 49 subjects (age range, 16–85 years; mean age 57 years \pm 18(SD); 28 men, 21 women; 4 volunteer and 45 patients with cardiac diseases) with multi-slice and multiphase short axis cardiac MRI (CMR) and VE cine MRI for measurements of left ventricular inflow wave in comprehensive cardiac study. In all subjects, the Doppler transmural flow velocity waveforms were obtained within 1 month. All MR images were transferred to an on line workstation (Philips Medical System, View forum Cardiac

MR) for cardiac functional analysis. The early peak filling rate (EPFR) and atrial peak filling rate (APFR), diastolic functional parameters were almost automatically derived from ventricular time-volume curves for systolic functional analysis. EPFR/APFR ratios were compared with E/A ratios measured by echocardiography and VE MRI, respectively.

Results

EPFR and APFR were automatically detected in 40(82%) of 49 subjects. In 5 of 9 patients who were not analyzed automatically, there was no little change of volume in early diastolic phase. As there was no change of the left ventricular volume during atrial construction, the APFR was not detected automatically in a patient with Hypertrophic cardiomyopathy. The EPFR/APFR ratio correlated better with E/A ratio using echo($r = 0.7$). There was excellent correlation between EPFR/APFR ratio and E/A with VE MRI($r = 0.9$).

Conclusion

Multi-slice and multi phase short axis cine MR-based semiautomatic volumetric analysis can provide useful information not only on global and local systolic function, but also on accurate diastolic function. Furthermore, this

method can offer efficiently diastolic parameters without VE cine on comprehensive cardiac study.

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