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Meeting abstract

1017 Computer-assisted calculation of myocardial infarct size shortens the evaluation time of contrast enhanced cardiac MRI

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Introduction

Delayed enhancement magnetic resonance imaging (DE-MRI) depicts scar in the left ventricle which can be quantitatively measured. Manual segmentation and scar determination is time consuming.

Purpose

The purpose of this study was to evaluate a software for infarct quantification (Segment, http://segment.heiberg.se), to compare with manual scar determination, and to measure the time saved.

Methods

Forty patients, 33 men and 7 women, age 65 ± 10 years (range 36–84) were consecutively enrolled. Patients referred for myocardial SPECT on suspicion of coronary artery disease were included if they had an irreversible uptake reduction suggesting a myocardial scar. A standard segmented IR turboFLASH sequence was employed on a Siemens Magnetom Vision 1.5 T magnet. Segmentation of the endo- and epicardial borders on short axis slices was performed manually and independently by two observers, followed by running the software for automatic determination of scar volume. The time required for segmentation was recorded. The automatic scar analysis took only a few seconds. In the manual method, the myocardium and the scar areas were delineated with Image J.

Results

The time for evaluating a cardiac MRI study was 9.2 ± 1.8 minutes with the semi-automatic corrected method, of which 1.2 ± 0.6 minutes was devoted to minor adjustments. The manual infarct sizing required 21.6 ± 4.5 minutes. Infarct volume and infarct percentage were 26+20 ml and 15+11% with the semiautomatic corrected method, 22+17 ml and 13+10% with the manual method. With the computer software, infarct volume and percentage was slightly larger, 3.8 ± 8.1 ml and 2.1 ± 4.4% than with the manual method, p = 0.005 for both, but the difference was deemed clinically acceptable.

Conclusion

A computer software for myocardial volume and infarct size determination cut the evaluation time by more than 50% compared with manual assessment, with maintained clinical accuracy.

The purpose was to evaluate a software for infarct quantification, to compare with manual scar determination, and to measure the time saved. Evaluation time was shortened 12.4 minutes per cardiac exam, compared with manual delineation, with maintained clinical accuracy.