

Assessment of Global Right Ventricular Function on 64-MDCT Compared with MRI

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Abstract

OBJECTIVE. The aim of this study was to compare ECG-gated 64-MDCT with MRI for the assessment of global right ventricular (RV) function from coronary CT angiography data.

SUBJECTS AND METHODS. Thirty-eight patients (25 men, 13 women; mean age \pm SD, 55.0 ± 8.8 years) with suspected coronary artery disease underwent contrast-enhanced 64-MDCT (64×0.6 mm, 120 kV, 770 mAs_{eff}) and 1.5-T MRI (balanced fast-field echo; TR/TE, 3.3/1.6; flip angle, 60°; 50 phases). Double oblique short-axis MDCT and MR images were used for further analysis. End-diastolic volume (EDV), end-systolic volume (ESV), stroke volume (SV), and ejection fraction (EF) were computed from manually drawn endocardial contours of the right ventricle. For statistical analysis, repeated-measures analysis of variance and Pearson's correlation coefficients were calculated. Bland-Altman plots were computed.

RESULTS. In general, RV volumes calculated from 64-MDCT agreed well with those calculated from MRI. The mean EF (\pm SD) calculated from MDCT and MRI was $51.0\% \pm 7.8\%$ and $51.4\% \pm 7.3\%$, respectively. An excellent correlation was observed for EDV ($r = 0.99$), ESV ($r = 0.98$), SV ($r = 0.98$), and EF ($r = 0.97$). Bland-Altman plots showed no systematic variation between MDCT and MRI data. No statistically significant differences ($p \leq 0.05$) between the techniques were found.

CONCLUSION. Although contrast injection is optimized for visualization of the coronary arteries, retrospectively ECG-gated 64-MDCT permits reliable assessment of global RV function.

Keywords: cardiac imaging, heart disease, MDCT, MRI, right ventricular function