

Meeting abstract

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221 Comparison of aortic valve area measured by cardiac MRI and dual-source CT

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Objectives

Dual-source computed tomography (DSCT) of the heart emerges as a routine clinical imaging tool. The purpose of this study was to evaluate DSCT as a reliable modality for quantifying aortic valve area (AVA) in comparison with cardiac magnetic resonance imaging (CMR).

Methods

29 consecutive patients with normal aortic valve function who underwent DSCT coronary angiography (Somatom Definition, Siemens, Erlangen, Germany) were included into the study. Retrospective ECG-gated contrast-enhanced DSCT scans with tube current modulation for patient dose reduction were performed, and data sets were reconstructed in 3% steps of the R-R interval (slice thickness 0.75 mm, increment 0.6 mm). Planimetry of the AVA in systole was assessed on cross-sectional images by use of multiplanar reformats. Within 48 hours, CMR was performed on a 1.5 T scanner (Magnetom Sonata, Siemens, Erlangen, Germany) using a balanced SSFP cine-sequence (TR 3 ms, TE 1.5 ms, FA 60°, spatial resolution 1.4 × 1.4 mm²). According to the DSCT investigation, MR-planimetry was performed on cross-sectional images of the aortic valve.

Analysis of the CMR and DSCT data were performed by using 3D Software (Siemens, Erlangen, Germany). Correlations among AVA estimated by CMR and DSCT were determined by linear regression analysis. The agreement

between both methods was assessed using the Bland Altman method.

Results

In all 29 patients the assessment of the AVA was feasible by CMR and DSCT. Mean AVA determined by CMR was 4.97 ± 1.1 cm² whereas the mean AVA determined by DSCT was 4.92 ± 1.0 cm². A strong positive correlation was found between both imaging modalities ($r = 0.96$, $p < 0.01$) (Figure 1). Bland Altman analysis demonstrates a good intermodality agreement with a slight underestimating of AVA by DSCT (Figure 2). The mean difference was -0.05 cm² with a standard deviation of 0.33 cm².

Conclusion

Compared to CMR, retrospective ECG gated contrast-enhanced DSCT with tube current modulation provides an accurate imaging technique for the assessment of aortic valve area. Further studies are required to determine whether DSCT similarly allows the assessment of the AVA in patients with aortic valve stenosis.

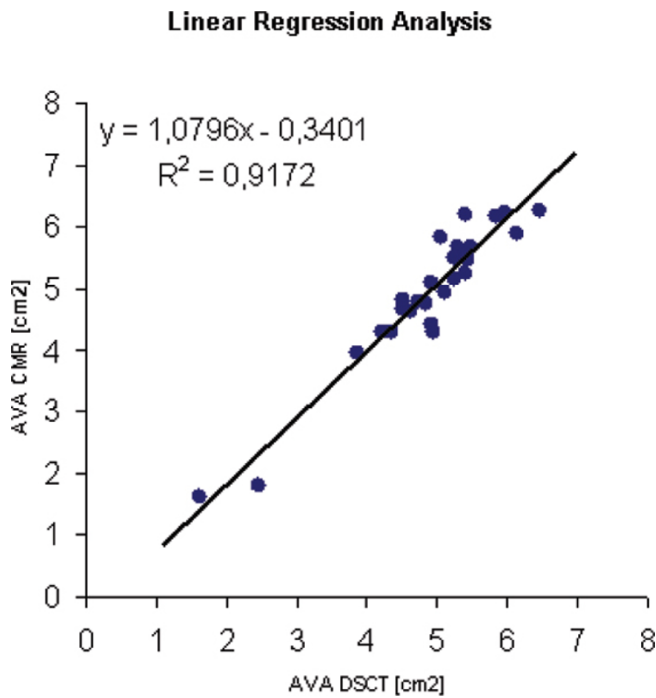


Figure 1
 Compared to CMR, DSCT with tube current modulation provides another accurate imaging technique for the assessment of aortic valve area.

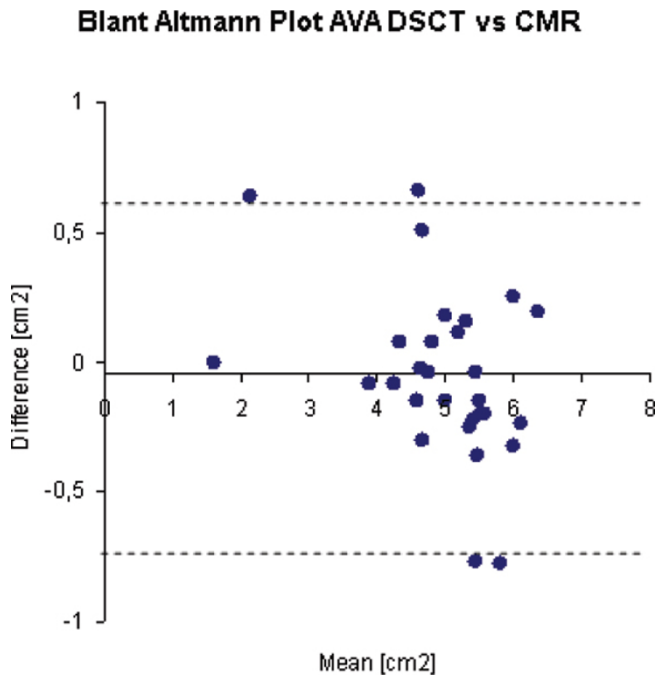


Figure 2

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