Quantification of aortic valve stenosis: head-to-head comparison of 64-slice spiral computed tomography with transesophageal and transthoracic echocardiography and cardiac catheterization


Objectives
We sought to evaluate the accuracy of multislice computed tomography (MSCT) with 64 detector rows for determination of the aortic valve area (AVA) compared with transesophageal and transthoracic echocardiography (TEE and TTE) and cardiac catheterization (CATH).

Materials and Methods
MSCT, TEE, TTE, and CATH were performed in 36 patients with aortic valve stenosis. AVA was determined by planimetry on MSCT and TEE and calculated using the continuity equation on Doppler TTE and the Gorlin formula on CATH.

Results
The mean AVA on MSCT (0.88 +/- 0.39 cm²) was not significantly different from TEE (0.94 +/- 0.41 cm²; P > 0.05) but significantly larger than TTE (0.74 +/- 0.28 cm²; P < 0.001) and CATH (0.75 +/- 0.31 cm²; P < 0.001). A good correlation with acceptable limits of agreement was found between MSCT and TTE (r = 0.91, limits +/-0.35 cm²) and between MSCT and CATH (r = 0.91, limits +/-0.32 cm²). An inferior correlation with wider limits of agreement was found between MSCT and TEE (r = 0.82, limits +/-0.48 cm²), but this applied also between TEE and TTE (r = 0.79, limits +/-0.51 cm²) and between TEE and CATH (r = 0.78, limits +/-0.52 cm²).

Conclusion
AVA determined by MSCT correlated well with TTE and CATH, but a systematic difference must be taken into account when using MSCT findings for therapeutic decision-making. Validation against both TTE and CATH revealed a superior correlation and narrower limits of agreement for MSCT than for TEE suggesting that AVA planimetry with MSCT is more reliable than with TEE.

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