

Young Investigators Awards

IMPACT OF CT-GUIDED VALVE SIZING ON POST-PROCEDURAL AORTIC REGURGITATION IN TRANSCATHETER AORTIC VALVE IMPLANTATION

Young Investigator Awards
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Background: Transesophageal echocardiography (TEE) is considered the gold standard method for annulus measurement in transcatheter aortic valve implantation (TAVI). However, computed tomography (CT) has several potential advantages. The purpose of this study was to clarify the impact of CT-guided valve sizing on outcomes after TAVI.

Methods: Among 337 consecutive TAVI cases in our institution, TEE-guided annulus measurement (Diam-TEE) was performed in 228 cases and CT-guided in 109. The mean annulus diameter by CT (mDiam-CT) was calculated as the geometric average of annulus diameters. Outcomes of these strategies were compared.

Results: Patients had similar Diam-TEE in both groups (22.1 ± 2.0 vs 21.8 ± 1.8 mm, $p=0.155$). The mDiam-CT was larger than Diam-TEE (23.4 ± 2.0 vs 22.1 ± 2.0 mm, $p<0.001$) in the CT-guided group. There was only a moderate correlation between these two measurements ($r = 0.675$, $P < 0.001$). Correlations between the Diam-TEE and the sDiam-CT ($r = 0.685$, $P < 0.001$) or the lDiam-CT ($r = 0.600$, $P < 0.001$) were also moderate. Based on the results of the MDCT assessment, the valve size selected for implantation was changed in 21 (19.3%) cases: valve upsizing in 19 patients and downsizing in 2 cases. A lower logistic EuroSCORE (20.6 ± 10.8 vs 24.8 ± 11.5 , $p=0.002$), larger prosthesis size (25.8 ± 2.1 vs 25.0 ± 1.9 mm, $p<0.001$), and higher valve/Diam-TEE ratio (1.17 ± 0.08 vs 1.14 ± 0.10 mm, $p=0.014$) were observed in the CT-guided group. In CT-guided patients, the incidence of post-procedural aortic regurgitation (AR) \geq grade 2 was reduced (19.1 vs 30.7%, $p=0.031$) and a similar risk of annulus rupture (0.9 vs 1.3%) was observed. The only predictor of post-procedural AR \geq 2 was the "valve/mDiam-CT ratio" (HR 0.909 by increase of 0.01, 95% CI: 0.837-0.987, $p=0.023$). A valve/mDiam-CT ratio <1.10 (AUC=0.688) predicted a higher rate of post-procedural AR \geq 2 (29.8 vs 11.3%, $p=0.015$).

Conclusions: CT-guided valve sizing significantly reduces the incidence of post-procedural AR, and is associated with increased device success compared to TEE-sizing. Routine use of CT may improve TAVI outcomes by reducing AR.