

# Computed tomography for the prediction of structural valve deterioration in patients undergoing transcatheter aortic valve implantation

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**Background:** Computed tomography (CT) provides excellent anatomy assessment of the aortic annulus (AoA) and is currently routinely utilized for pre-procedural planning of transcatheter aortic valve implantation (TAVI). This study sought to investigate if geometrical characteristics of the AoA determined by CT may represent predictors of structural valve deterioration (SVD) in patients undergoing transcatheter aortic implantation (TAVI) with balloon-expandable valves.

**Methods:** AoA maximum diameter (Dmax), minimum diameter (Dmin), and area were assessed using pre-procedural CT in patients undergoing TAVI in our Institution. SVD was identified with transthoracic echocardiography at  $5.9 \pm 1.7$  follow-up years.

**Results:** 124 consecutive patients (mean age:  $79 \pm 7$  years old; female: 61%) were retrospectively enrolled. AoA Dmax, Dmin and area were significantly smaller in patients with SVD compared to patients without SVD ( $27.1 \pm 2.8$  mm vs  $25.6 \pm 2.2$  mm,  $p = 0.012$ ;  $21.8 \pm 2.1$  mm vs  $20.5 \pm 2.1$  mm,  $p = 0.001$  and  $467 \pm 88$  mm<sup>2</sup> vs  $419 \pm 77$  mm<sup>2</sup>,  $p = 0.002$  respectively). At univariate analysis, female sex, body surface area, the use of a -23 mm prosthetic valve a Dmax  $< 27.1$  mm and a Dmin  $< 19.9$  mm were all variables independently associated with SVD whereas at multivariate analysis, only Dmin  $< 19.9$  mm (OR = 2.873, 95% CI: 1.191-6.929,  $p = 0.019$ ) and female sex (OR = 2.659, 95% CI: 1.095-6.458,  $p = 0.031$ ) were independent predictors of SVD.

**Conclusions:** Female sex and AoA Dmin < 19.9 mm are associated to SVD in patients undergoing TAVI with balloon expandable valves.

Abstract Figure.

