

Optimal sizing for SAPIEN 3 transcatheter aortic valve replacement in patients with or without left ventricular outflow tract calcification



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KEYWORDS

- annulus rupture
- aortic stenosis
- multislice computed tomography (MSCT)
- paravalvular leak
- transcatheter aortic valve replacement (TAVR)

Abstract

Aims: The impact of left ventricular outflow tract calcification (LVOT-CA) on SAPIEN 3 transcatheter aortic valve replacement (S3-TAVR) is not well understood. The aims of the present study were to determine optimal device sizing for S3-TAVR in patients with or without LVOT-CA and to evaluate the influence of residual paravalvular leak (PVL) on survival after S3-TAVR in these patients.

Methods and results: This study analysed 280 patients (LVOT-CA=144, no LVOT-CA=136) undergoing S3-TAVR. Optimal annular area sizing was defined as % annular area sizing related to lower rates of \geq mild PVL. Annular area sizing was determined as follows: (prosthesis area/CT annulus area-1) \times 100. Overall, \geq mild PVL was present in 25.7%. Receiver operating characteristic curve analysis for prediction of \geq mild PVL in patients with LVOT-CA showed that 7.2% annular area sizing was identified as the optimal threshold (area under the curve [AUC] 0.71). Conversely, annular area sizing for no LVOT-CA appeared unrelated to PVL (AUC 0.58). Aortic annular injury was seen in four patients (average 15.5% annular area oversizing), three of whom had LVOT-CA. Although there was no difference in one-year survival between patients with \geq mild PVL and without PVL (log-rank $p=0.91$), subgroup analysis demonstrated that patients with \geq moderate LVOT-CA who had \geq mild PVL had lower survival compared to patients with \geq mild PVL and none or mild LVOT-CA (log-rank $p=0.010$).

Conclusions: In the setting of LVOT-CA, an optimally sized S3 valve is required to reduce PVL and to increase survival following TAVR.

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