

Computed tomography derived left ventricular global longitudinal strain associate with clinical outcomes in patients undergoing transcatheter aortic valve replacement

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Background: Computed tomography angiography (CTA) is key imaging modality for procedure planning for transcatheter aortic valve replacement (TAVR). Functional assessment by CTA with LV global longitudinal strain (LVGLS) has recently shown to be feasible. However, there is limited data on its prognostic value in patients with severe aortic stenosis (AS) who treated with TAVR.

Purpose: To evaluate the association of baseline CTA-LVGLS with post-TAVR outcome.

Methods: Patients who underwent contrast multiphasic gated CTA for TAVR planning were studied. LVGLS was measured using dedicated feature-tracking software (Medis®). Cox regression analysis evaluated the association of baseline LVGLS with a composite outcome of all-cause death and heart failure hospitalization after TAVR.

Results: A total of 431 patients were included (median [IQR] age, 83 [77,87]years; 44% female); the society of Thoracic Surgeons Predicted Risk of Mortality (STS-PROM) score, 3.3 [2.3,5.1]%; CTA-LVGLS, -18.0 [-21.6,-14.2]%; LV ejection fraction was preserved at 60 [55,65]%. After a median follow-up of 19 [13,27] months, 99 composite outcomes occurred after TAVR. On multivariable Cox regression analysis, LVGLS was associated with the risk of composite outcome even after adjustment for baseline characteristics (Figure A). Patients with reduced LVGLS (above the median >-18.0%) had higher risk of the composite outcome than those with preserved GLS (p = 0.003; Figure B).

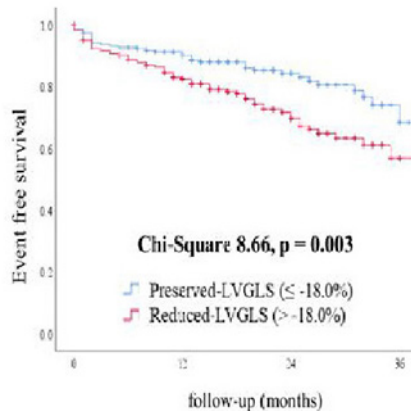
Conclusion: Baseline CTA-LVGLS was associated with the risk of death or heart failure hospitalization over the clinical and echocardiographic characteristics in severe AS patients undergoing TAVR.

Abstract Figure.

Panel B. Kaplan Meier analysis for composite outcome

Panel A. Multivariable Cox regression analysis

	Adjusted HR	95% CI	p Value
CTA-LVGLS (per 1% worsening)	1.06	1.01-1.12	0.016
Age (per 1year increase)	1.01	0.98-1.04	0.639
STS-PROM score (per 1% increase)	1.09	1.00-1.18	0.041
Echo-LAVI (per 1ml/m ² increase)	1.01	1.00-1.02	0.051
Mean AV PG < 40mmHg	2.06	1.23-3.45	0.006
TAPSE <1.7cm	0.99	0.60-1.64	0.978



Preserved LVGLS	215	181	81	13
Reduced LVGLS	215	165	69	10