Abstract: P3381

Quantification of hypo-attenuated leaflet thickening after transcatheter aortic valve implantation - clinical relevance of HALT volume

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On behalf: Cardiovascular Imaging Research Group, Semmelweis University, Budapest, Hungary

Topic(s):
Computed Tomography: Valve Disease

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Background: Hypo-attenuated leaflet thickening (HALT) is a recently recognized phenomenon following transcatheter aortic valve implantation (TAVI) and there is no consensus over the standardized assessment of HALT and its clinical relevance is poorly understood. We sought to determine the predictors and clinical significance of HALT volume.

Methods: Patients, who previously underwent TAVI between 2011 and 2016 were prospectively enrolled in the RETORIC (Rule out Transcatheter Aortic Valve Thrombosis with Post Implantation Computed Tomography) study, a single-center observational study. At inclusion cardiac computed tomography angiography (CTA), transthoracic echocardiography (TTE) and brain magnetic resonance imaging (MRI) was performed. HALT was volumetrically quantified on cardiac CTA images by segmenting the inner volume of the TAVI frame at the level of the leaflets and applying a threshold of −200 to 200 Hounsfield units. We evaluated the clinical predictors of HALT volume, and its association with ischemic brain MRI lesions (recent and chronic large vessel ischemic focuses, microbleed/microembolization, white matter or small vessel disease) and all-cause mortality.

Results: In total, we analyzed 111 patients with CoreValve bioprosthesis (56.7% female, mean age 80.3±7.4 years). A median of 19 [IQR: 11–29] months passed between TAVI procedure and enrollment. The mean HALT volume was 111.0±163.4 mm³. Current malignant disease, prosthesis implantation depth measured on CTA images acquired at inclusion, and aortic mean gradient and aortic valve area evaluated on TTE images at inclusion predicted HALT volume by univariate analysis (all p<0.05). After multivariate adjustment, aortic mean gradient remained a significant predictor of HALT volume (beta-coefficient: 11.5, 95% CI: 5.0–18.0; p<0.001). HALT volume was not associated with ischemic brain MRI lesions (all p>0.05) and did not predict all-cause mortality (median follow-up: 20 months [IQR: 18–23]; HR: 1.0; 95% CI: 1.0–1.0; p=0.15).

Conclusion: Aortic mean gradient was the only predictor independently associated with HALT volume. Our results suggest that TAVI valve function is negatively affected by HALT volume, however, we found no association of HALT volume with cerebrovascular ischemic lesions or increased risk for all-cause mortality.
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Volumetric quantification of HALT.