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Acceleration time and Low Flow, Low Gradient, Severe Aortic Stenosis: Correlation and Prediction of Valve Area
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BACKGROUND Low flow, low gradient, aortic stenosis is becoming increasingly recognized as a subgroup of severe aortic stenosis. Acceleration time (AT) has been correlated with severity of severe aortic stenosis (AS). We examined the epidemiology of Low flow, low gradient (LF/LG) severe AS and the correlation with AT to predict the valve area.

METHODS We studied 138 consecutive patients diagnosed with severe AS and normal ejection fraction (~55%) by echocardiography. The mean age was 81±10 yrs; 66% were females, 63% were African Americans and 86% had hypertension. Chi square test was used for comparing binary variables; student t-test for comparing means, and linear regression was performed using IBM SPSS.

RESULTS 47 (34%) patients had stroke volume index < 35 and 28 (20%) had low flow and low aortic mean gradient (~40 mmHg). There were no significant differences in gender and race distribution or past medical history in the groups divided based on LF/LG. The aortic valve area by continuity equation was 0.74±0.16 vs 0.73±0.14, nor was there a difference in AVA index, dimensionless index or EF. Mean gradient (45±16 vs 27.5±7 mmHg), as did peak gradient (73±23 vs 48±12 mmHg), stroke volume index (42.4±10 vs 28±5 mL/m2), ZVA (4.3±1.4 vs 5.4±1.8), average AT (113±20 vs 94±16 ms) and average ejection time (316±31 vs 292±37 sec) were significantly different (p <0.01). AT significantly and negatively correlated with AVA index in both the LF/LG (r =-0.368, p <0.01) and rest of the cohort group (r =-0.444, p <0.01). Adjusted for age, gender, race, and ejection fraction using linear multivariate regression analysis, AT and LF/LG were significant predictors of AVA index.

CONCLUSIONS Acceleration time is significantly correlated with AVA index derived from the continuity equation in both traditional severe AS and in LF/LG severe AS, and is an independent predictor of AVA index. The utility of AT in differentiating the severe from moderate AS in LF/LG group needs to be evaluated.

KEYWORDS Structural Valvular Disease: Aortic

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Outcomes in Patients with Transcatheter Aortic Valve Replacement and Left Main Stent: The multicenter, multinational TAVR-LM Registry
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BACKGROUND A percutaneous approach with transcatheter aortic valve replacement (TAVR) and percutaneous coronary intervention (PCI) of the left main (LM) is frequently utilized in high-risk patients with coexisting aortic stenosis and LM disease. Outcomes of TAVR plus LM PCI (Figure 1A) have not been previously reported. The primary objective of the TAVR-LM registry is to evaluate the clinical outcomes in patients undergoing TAVR plus LM PCI.

METHODS We retrospectively collected clinical, echocardiographic, computed-tomographic and angiographic characteristics in 204 patients undergoing TAVR plus LM PCI. One-hundred twenty-eight matched patient pairs were generated by performing 1:1 case-control matching between 167 patients with pre-existing LM stent undergoing TAVR and 1188 control patients undergoing TAVR without LM revascularization.

RESULTS One-year mortality (9.4% vs. 10.2%, p = 0.83) was similar between the TAVR plus LM PCI cohort and matched controls (Figure 1B). One-year mortality after TAVR plus LM PCI was not different among patients with unprotected, compared to protected LM (7.8% vs. 8.1%, p = 0.88); among those with ostial versus non-ostial LM stents (10.3% vs. 15.6%, p = 0.20); and among those undergoing LM PCI within 3 months, compared to those with LM PCI greater than 3 months prior to TAVR (7.4% vs. 8.6%, p = 0.61). Un-planned LM PCI performed due to TAVR-related coronary complication, compared to planned LM PCI performed for pre-existing LM disease, resulted in increased 30-day (15.8% vs. 3.4%, p = 0.013) and 1-year mortality (21.1% vs. 8.0%, p = 0.071).