Reduced LV ejection fraction (LVEF) is a powerful risk factor for mortality in patients with severe AS. However, this parameter may underestimate the presence and extent of myocardial dysfunction. The objective of this study was to assess the impact of baseline LV global longitudinal strain (GLS) on mortality in patients with severe AS undergoing TAVI.

Methods: We analyzed the clinical and echocardiographic baseline data of 248 consecutive patients (age: 81±8 years, mean±SD; median Logistic EuroSCORE: 19.1%) who underwent TAVI with the Edwards SAPIEN valves between January 2005 and March 2012 in a tertiary center. GLS measures were performed retrospectively in a Core Lab with a dedicated software ("Cardiac Performance Analytics").

Results: Baseline LVEF was 54±15% (25% of patients had a LVEF<50%). GLS was feasible in 194 patients (78%) and mean GLS was 14.7±4.2%. During a mean follow-up of 19±15 months, there were 71 deaths (39 from cardio-vascular [CV] causes) including 21 within the first 30 days. GLS was significantly associated with all-cause (HR=1.08, 95% CI [1.02 to 1.14], p<0.01) and CV mortality (HR=1.10, 95% CI [1.02 to 1.20], p=0.01) but not with 30-day mortality. The other parameters associated with mortality in univariable analysis were male gender (p=0.002), atrial arrhythmia (p=0.04), coronary artery disease (p=0.03), low glomerular filtration rate (GFR, p=0.02), EuroSCORE (p=0.01), STS score (p=0.02), low mean gradient (p=0.03), low stroke volume index (SVI, p<0.001) and low LVEF (p<0.03). On multivariate analysis, male gender (HR=2.3, p=0.01), GFR (HR=0.82 per 10 ml/min increase, p=0.002) and SVI (HR=0.95 per 1 ml increase, p=0.01) were independent predictor of all-cause mortality but not GLS. Male gender (HR=2.5, p<0.001), atrial arrhythmia (HR=2.3, p=0.01), trans-apical approach (HR=2.5, p=0.01) and GFR (HR=0.79 per 10 ml/min increase, p=0.01) were independent predictors of CV mortality. In the subset of patients with LVEF<60% (n=112), GLS was associated with CV mortality (HR=1.17, 95% CI 1.01 to 1.36, p=0.04) even after adjustment for LVEF.

Conclusions: Baseline GLS is significantly associated with mortality in patients undergoing TAVI. However, this parameter appears to provide incremental prognostic value beyond LVEF only in patients with normal LVEF. GLS may be helpful to enhance risk stratification prior to TAVI in the subset of patients with preserved LVEF.

P5409 | BEDSIDE
Recovery of left ventricular systolic function in different entities of aortic stenosis 12 months after TAVI
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Background: TAVI improves prognosis of high-risk patients. However, data concerning the impact of TAVI on regional and global LV mechanics in varying entities of severe AS are sparse, particularly in patients with paradoxical low flow aortic stenosis (PLF) or with reduced Left Ventricular Ejection Fraction (LVEF).

This study evaluated the effects of Transcatheter Aortic Valve Implantation (TAVI) on Left Ventricle (LV) mechanics in varying entities of aortic stenosis (AS) 12 months after implantation.

Methods: A total of 54 consecutive patients with severe AS (24 with normal LVEF and normal flow, 16 with PLF, and 14 with reduced LVEF were included. Normal LVEF and normal flow were defined as LVEF ≥ 50% and SVI ≥ 35 ml/m². Paradoxical low flow was defined as LVEF ≥ 50% and SVI < 35 ml/m² and patients with reduced LVEF, as LVEF < 50%. Speckle tracking echocardiography was performed before and 12 months after TAVI to determine LV global and regional longitudinal deformation.

Results: In three entities of AS, there was significant improvement of global and regional LV longitudinal function (global longitudinal strain: -14.1±3.9% at baseline vs. -16.5±4.2% after TAVI, P<0.001). Interestingly, the beneficial effects were most pronounced in patients with PLF (-14.0±2.9% vs. -17.0±4.4%, P<0.031) but was significant in all subgroups: normal EF (-16.1±3.4% vs. -18.1±3.3%, P=0.012) and reduced EF (-10.5±3.1% vs. -13.5±3.2%, P=0.028).

Conclusions: Regardless of the underlying AS entity, TAVI improves global and regional left ventricular mechanics within 12 months. This improvement is more pronounced in patients with PLF.

P5410 | BEDSIDE
Severe cardiac autonomic failure as risk predictor in patients undergoing aortic valve replacement or transcatheter aortic valve implantation
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Background: A substantial number of patients with aortic valve stenosis (AS) suffer from severe cardiac autonomic failure (SAF) defined as combination of abnormal heart rate turbulence and deceleration capacity. Here we hypothesized that presence of SAF is a strong and independent predictor of adverse outcome in patients with severe AS undergoing aortic valve replacement (AVR) or transcatheter aortic valve implantation (TAVI).

Methods: We included 161 consecutive patients with severe AS in sinus rhythm who underwent AVR (n=53) or TAVI (n=108) at our institution. Twenty-four hour Holter recordings were performed prior to operation. SAF was assessed according to previously published technologies. SAF was considered present if Turbulence Onset >0%, Turbulence Slope ≤2.5ms/RRI and deceleration capacity ≤4.5ms.

Multivariable analyses included SAF, age ≥80 years, increased levels of brain natriuretic peptides and the logistic Euro Score. Primary endpoint was two-year all-cause mortality.

Results: During a median follow of 312 days, 11 patients died. Twenty-three of 161 patients (14.3%) were SAF-positive prior to operation. SAF-positive patients had a cumulative mortality rate of 32.6% compared to 4.2% in SAF-negative patients (p<0.0001; Figure 1). Multivariably, SAF was the only independent predictor of mortality (hazard ratio 6.1; 95% CI 1.7-21.5; p<0.006).

Discussion: Presence of SAF is a strong and independent predictor of mortality in patients who undergo AVR or TAVI.

P5411 | BEDSIDE
Prompt augmentation in systolic coronary flow velocity and forward coronary wave energy in patients undergoing transcatheter aortic valve implantation
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Background: Aortic valve stenosis (AVS) can cause angina despite unobstructed coronary arteries. We used wave intensity analysis to elucidate the mechanisms underlying compromised coronary microcirculation in response to transcatheter aortic valve implantation (TAVI). Wave intensity distinguishes between left ventricular forward (FW) traveling and microcirculatory backward (BW) traveling contributions and between compression waves (BCW and FCW, resp.) during the contraction phase and expansion waves (FEW and BEW, resp.) during cardiac relaxation.

The aim of this study was to investigate the effect of TAVI on coronary hemodynamics and wave intensity.

Methods: Intracoronary pressure (Py) and flow velocity (U) at rest were simultaneously measured in an angiographically normal coronary vessel in 14 patients with severe AVS (0.9±0.3 cm²) and LV hypertrophy before (Pre) and after (Post) TAVI. Net wave intensity was computed as WI = |(P/Py)U/Py| and the energy of the separated forward (FW) and backward (BW) waves was determined by the respective area under the curve. Coronary microvascular resistance (MR = PoU) was assessed for all patients. Systolic and diastolic velocity time integrals (VTIs)