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Different response of myocardial contractility by layer following acute pressure unloading after transcatheter aortic valve implantation

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Background: Transcatheter aortic valve implantation (TAVI) is an effective therapeutic option for severe symptomatic aortic stenosis (AS) with intermediate/high surgical risk. Aim of this study was to examine the acute effect of TAVI in terms of pressure unloading, on left ventricular (LV) mechanics using multilayer global longitudinal strain (GLS) by 2D speckle-tracking echocardiography (ST-E).

Methods: A total of 44 patients (mean age 81.8 ± 2, 34% male) with severe symptomatic AS and preserved LV ejection fraction (LVEF) underwent 2D echocardiography at baseline and 5 ± 2 days after TAVI. GLS was measured from the endocardial layer (Endo-LS), epicardial layer (Epi-LS) and full thickness of myocardium before and after the procedure. Analysis included other parameters such as age, sex, LV volumes and ejection fraction (LVEF), type of prosthesis implanted, right ventricular (RV) dimension and function.

Results: By dividing patients in two groups accordingly with LV geometry assessed with regional wall thickness measurement (concentric vs eccentric hypertrophy), better values of Endo-LS were recorded at baseline, in patients with concentric hypertrophy (-12.9 ± 2 vs -11 ± 3, p = 0.048). After TAVI, a significant improvement in Endo-LS was observed, but only in patients with concentric hypertrophy (-12.9 ± 2 vs -14.2 ± 2, p = 0.003).

Conclusion: The improvement in LS was more prominent in the endocardium, which was evident even immediately after TAVI only in patients with concentric hypertrophy. Evaluation of multilayer strain may provide new insights into the positive effects of unloading in patients with AS and may be potentially useful to predict patients with better outcome after TAVI.

Parameter	RWT > 0.42 31 pz (70%)	RWT ≤ 0.42 13 pz (30%)	p
Male sex (n, %)	8 (25%)	7 (53%)	NS
Age (y.o)	81 ± 6	83 ± 7	NS
CAD (n, %)	3 (9%)	8 (61%)	NS
LVEDV (ml)	97 ± 29	134 ± 14	0.002
LVESV (ml)	43 ± 15	72 ± 38	0.001
LVEF(%)	56.2 ± 6	50 ± 12	NS
AVA (cm^2)	0.8 ± 0.2	0.8 ± 0.3	NS
GLS (%)	-11.4 ± 3	-10.5 ± 3	NS
Endo-LS (%)	-12.9 ± 2	-11 ± 3	0.048
Epi-LS (%)	-10.8 ± 4	-9.9 ± 3	NS

Abstract P1365 Figure.