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Short-term reversed remodeling post aortic valve intervention

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Background: LV remodeling in AS can cause LV hypertrophy, interstitial fibrosis and reduced contractility. SAVR or TAVI are the mainstay treatment for symptomatic severe AS. Speckle tracking has the potential to detect early signs of reverse cardiac remodeling but such LV deformation data post-SAVR/TAVI is currently lacking.

Aim: To assess the early impact of LV unloading post-TAVR/SAVR using STE.

Methods: This prospective single-center study recruited 122 patients with varying degrees of AS who underwent resting transthoracic echocardiography with offline speckle-tracking. During the follow-up period, 50 patients underwent TAVI and 15 had SAVR.

Results: Patients were followed-up for a period of 4 ± 2 weeks post-intervention. Table 1 summaries the echocardiographic findings of patients pre- and post-intervention. AV peak velocity and mean pressure gradient dropped significantly immediately after intervention in both groups. AV intervention resulted in early improvements in all myocardial deformation parameters (Figure 1). There was a significant improvement in GLS and GRS irrespective of the intervention type. While SAVR led to a significant early improvement in GCS.

Conclusion: AV Intervention in severe symptomatic AS translates into an immediate and measurable improvement in LV deformation parameters. To our knowledge this is the first echocardiographic evidence of reverse remodeling early after SAVR and TAVI.

Table 1

Variables	TAVI (n = 50)			SAVR (n = 15)				
	Pre	Post	P* value	Pre	Post	P* value	P value+	
AV vel.(m/s)	4.4 ± 0.8	2.2 ± 0.5	<0.001	4.5 ± 0.8	2.2 ± 0.5	<0.001	NS	
AV mPG (mmHg)	44.3 ± 16.2	9.7 ± 3.9	<0.001	44.6 ± 19.2	9.8 ± 4.8	<0.001	NS	
GLS (%)	-10.9 ± 3.6	-13.9 ± 3.1	<0.001	-13.7 ± 4.5	-17.7 ± 3.9	0.002	NS	
GCS (%)	-29.2 ± 9.1	-32 ± 9.5	NS	-28.6 ± 9.8	-34.9 ± 5.1	0.032	NS	
GRS (%)	42.0 ± 15.1	47.2 ± 13	0.024	34.7 ± 12.5	41.4 ± 9.9	0.04	NS	
EDV (ml)	87.29 ± 55.3	89.8 ± 38.6	NS	104.3 ± 25.1	83.2 ± 41.9	NS	NS	
ESV (ml)	45.1 ± 39.4	36.6 ± 29.1	NS	42.8 ± 17.7	28.6 ± 18.6	0.03	NS	
SV (ml)	59.7 ± 23.6	55 ± 19.3	NS	65.5 ± 17.9	57.2 ± 22.7	NS	NS	
SVi (ml/m2)	33.1 ± 12.7	30.4 ± 9.6	NS	34.1 ± 8.3	29.8 ± 11.1	NS	NS	
LV mass (g)	185.7 ± 53.6	183.3 ± 48.	NS	177.5 ± 48.4	169.5 ± 52.2	NS	NS	
LVMi (g/m2)	103.6 ± 30	102.1 ± 25.9	NS	93.8 ± 29.9	89.4 ± 24.2	NS	NS	
Biplane EF (%)	58 ± 15	62 ± 13	0.013	60 ± 9	66 ± 6	<0.05	NS	

AV: Aortic valve; EDV: end diastolic volume; EF: ejection fraction; ESV: end systolic volume; GCS: Global circumferential strain; GLS: Global longitudinal strain; GRS: Global radial strain; LV: left ventricle; LVMi: left ventricular mass index; mPG: mean pressure gradient; SV: stroke volume; SVi: stroke volume index; Vel: velocity

Data are expressed as mean ± SD. Comparisons were performed using paired Student"s t tests(parametric) or Wilcoxon paired test (non-parametric).

*Pre and post intervention.

+Comparison of pre/post-intervention measurement difference between the two intervention groups done using unpaired t-test

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