

Global and regional longitudinal function recovery in patients with severe aortic stenosis after aortic valve replacement

Vlatka Rešković
Lukšić*

Dejan Došen

Sanja Ceković

Sandra Večerić

Jadranka Šeparović
Hanževački

University of Zagreb School
of Medicine, University
Hospital Centre Zagreb,
Zagreb, Croatia

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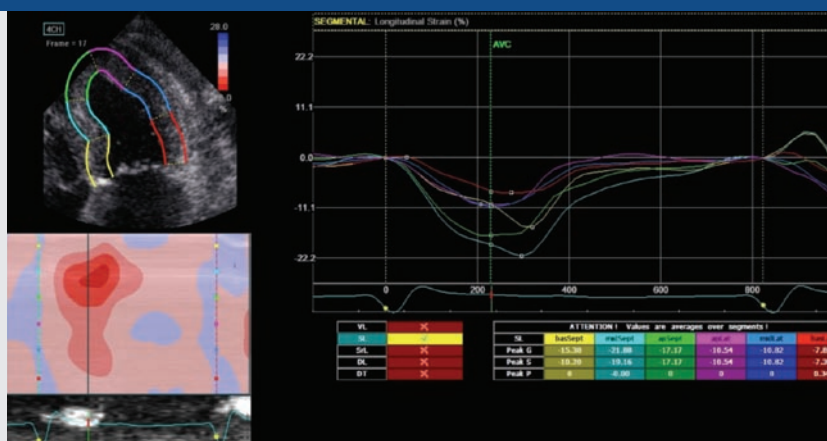
ORCID: Vlatka Rešković Lukšić, <http://orcid.org/0000-0002-4721-3236> • Dejan Došen, <http://orcid.org/0000-0002-2641-4768> • Sanja Ceković, <http://orcid.org/0000-0003-3892-7680> • Sandra Večerić, <http://orcid.org/0000-0002-8070-1012> • Jadranka Šeparović Hanževački, <http://orcid.org/0000-0002-3437-6407>

***ADDRESS FOR CORRESPONDENCE:** Vlatka Rešković Lukšić, Klinički bolnički centar Zagreb, Kišpatičeva 12, HR-10000 Zagreb, Croatia. Phone: +385-91-561-2526. E-mail: vlatka.reskovic@gmail.com

AIM: Global and regional left ventricular (LV) longitudinal strain (LS) is often reduced, despite normal LV ejection fraction (LVEF) in patients with severe aortic stenosis (AS).¹⁻⁴ We wanted to analyze subtle regional longitudinal LV deformation changes after aortic valve replacement (AVR).

FIGURE 1.

Left ventricular longitudinal strain curves show segmental loss of longitudinal LV function.



PATIENTS AND METHODS: 45 patients with severe symptomatic AS (AVA/BSA $0.33\pm 0.09\text{cm}^2/\text{m}^2$) and preserved LVEF (57.3 ± 8), without concomitant coronary artery disease were enrolled. Complete transthoracic echocardiography with longitudinal strain analysis by speckle tracking was performed before, in early postoperative period (7.5 ± 6.2 postoperative days) and late follow up (mean 17.14 months).

RESULTS: GLS was reduced in patients prior AVR ($-12.64\pm 6.7\%$) (Figure 1). We found no statistically significant difference in GLS ($p=0.888$) in early postoperative period and neither in late follow up ($p=0.109$), although trend

was towards improvement in global LS and absolute values came close to normal (-19.6%). Regional longitudinal strain analysis of the LV basal segments in early postoperative period showed significant improvement of longitudinal LV function in the basal interventricular (IV) septum ($p=0.011$). Those differences were even more expressed in late follow up – there was also significant improvement of LS in the basal lateral LV wall ($p=0.015$).

CONCLUSION: After AVR, even in early postoperative period, we found significant improvement of longitudinal deformation in basal IV septum. Those changes attribute to pressure unload, while in late follow up, because of LV positive remodeling, basal lateral LV segment also recovers in longitudinal function. We conclude that IV septum has not permanently lost his longitudinal function in spite of low longitudinal LS prior surgery. This is the area most prone to pressure overload state and it recovers immediately after operation due to pressure unload. Later on, positive remodeling takes place, so that other LV segments can also improve their function.

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