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The association of global longitudinal strain and clinical outcomes of the advanced heart failures

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Background/Aims: The heart failure (HF) patients with severe left ventricular (LV) systolic dysfunction still have unfavorable prognosis. We aimed to investigate if better global longitudinal strain (GLS) predicts improved clinical outcomes in these patients. **Methods:** Among 293 consecutive HF patients with severe LV systolic dysfunction, defined as LV ejection fraction (LVEF) ≤30% at baseline echocardiogram, in an urban tertiary center (October 2013-September 2017), the predictive ability of GLS by speckle-tracking echocardiography for the subsequent occurrence of clinical outcomes was evaluated. The primary outcome was composite endpoint which was defined as cardiac death and HF readmission. **Results:** Composite endpoint occurred in 140 patients (47.8%) during a mean 367 days of follow-up. GLS was independently predictive of composite endpoint, but LVEF was not. In the receiver operating characteristic curve analyses of GLS, the cutoff values for predicting composite endpoint were -9.9 % (sensitivity: 0.90; specificity: 0.28; area under the curve: 0.598). Better GLS group (defined as GLS ≤-9.9%, *n*=54), compared to worse GLS group (defined as GLS >-9.9%, *n*=239), had significantly lower rate of composite endpoint (24.1% vs. 53.1%, *p*<0.001). Composite endpoint-free survival rate was significantly higher in better GLS group than worse GLS group (75.9% vs. 46.9%, log rank *p*=0.022). **Conclusions:** The measurement of GLS may provide the additive information for subsequent clinical outcomes in HF patient with severe LV systolic dysfunction, whereas independent validations of these findings in a large number of population and a longer follow up period are needed.

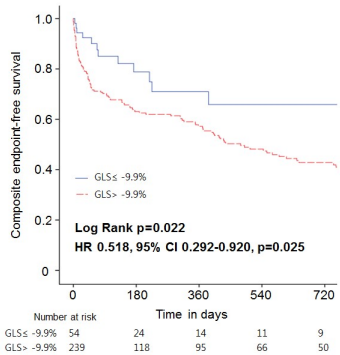

Table. Clinical outcomes

	GLS≤-9.9% (n=54)	GLS>-9.9% (n=239)	p
All cause death	8 (14.8%)	46 (19.2%)	0.561
Cardiac death	5 (9.3%)	40 (16.7%)	0.212
Non-cardiac death	3 (5.6%)	6 (2.5%)	0.374
HF readmission	8 (14.8%)	87 (36.4%)	<0.001
Cardiac death and HF readmission	13 (24.1%)	127 (53.1%)	<0.001
All cause death and HF readmission	16 (29.6%)	133 (55.6%)	0.001

GLS, global longitudinal strain; HF, heart failure.

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Complete recovery of acute decompensated heart failure induced by fractured mechanical valve

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The escape of the prosthetic valve leaflet is a rare cause of acute prosthetic dysfunction and is associated with a high mortality rate. Here, we report a case of leaflet escape of mechanical valve in a hemodynamically unstable man requiring venoarterial extracorporeal membrane oxygenation (ECMO) and urgent surgical valve replacement. A 43-year-old man who had undergone mitral and aortic valve replacement 24 years ago due to infective endocarditis presented with sudden onset dyspnea. Laboratory tests confirmed pulmonary edema and cardiogenic shock. He was immediately intubated and mechanically ventilated. On bedside transthoracic echocardiography, there were suspicious findings of severe mitral regurgitation, but the specific etiology related with the valve dysfunction was not determined due to tachycardia and poor echo window. ECMO was placed emergently as the patient suffered progressive hypoxia and hypotension despite use of ventilator, inotropes and optimal medical treatment. ECMO allowed an improvement in the patient's clinical condition. Repeated transthoracic echocardiography and subsequent transesophageal echocardiography (TEE) demonstrated massive mitral regurgitation and only a single prosthetic mitral leaflet (Figure, left; 3D TEE image). The patient underwent emergent operation for mitral valve replacement (MVR). One of the two leaflets in mitral position was absent (Figure, middle; removed prosthetic mitral valve), and the missing leaflet could not be found within the cardiac cavity and aorta. The abdominal computed tomography scan performed one week after operation revealed two fragments of prosthetic valve leaflet in the left common iliac artery and left external iliac artery, respectively. Twenty days after the redo-MVR, the two fractured leaflets were removed from the iliac artery (Figure, right) and the patient recovered uneventfully.