

## Clinical significance of left atrial geometry in patients with dilated cardiomyopathy: a cardiovascular magnetic resonance study

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**Background:** Left atrial (LA) enlargement is associated with cardiac events in patients with dilated cardiomyopathy (DCM). However, the clinical significance of LA function and geometry in patients with DCM remains uncertain. Cardiac magnetic resonance (CMR) is the current gold standard modality to assess LA function and geometry.

**Purpose:** The aim of the present study was to investigate the clinical significance of LA parameters assessed by CMR in patients with DCM.

**Methods:** The present study included patients with DCM and sinus rhythm who underwent CMR between December 2007 and April 2018. LA volume was measured using CMR. LA empty fraction was calculated according to LA volume differences. The LA sphericity index was computed as the ratio of the measured LA maximum volume to the volume of a sphere with maximum LA length diameter (Figure 1A). We investigated the relationship between LA parameters measured by CMR and hospitalization for heart failure (HF).

**Results:** We included 255 patients in this study. During the mean follow-

up of 3.66 [1.85–6.25] years, hospitalization for HF occurred in 37 patients (14.5%). Although there were no significant differences in LA volume and LA empty fraction between patients with HF hospitalization and those without, LA sphericity index was significantly higher in patients with HF hospitalization than in those without ( $0.78 \pm 0.35$  vs.  $0.58 \pm 0.18$ ,  $P < 0.001$ ). Multi-variable Cox regression analysis identified higher LA sphericity index (per 0.1 increase) as an independent predictor of hospitalization for HF (hazard ratio, 1.23; 95% confidence interval, 1.10–1.35,  $P < 0.001$ ). Moreover, Patients were categorized based on the median of the LA sphericity index. The Kaplan-Meier curve showed that patients with high LA sphericity index ( $\geq 0.57$ ) had a significantly higher risk of hospitalization for HF than those with low LA sphericity index ( $< 0.57$ ) (Figure 1B).

**Conclusions:** LA sphericity index was an independent predictor of hospitalization for HF. Assessment of LA geometric parameter including LA sphericity might be useful for risk stratification toward worsening HF in patients with DCM.

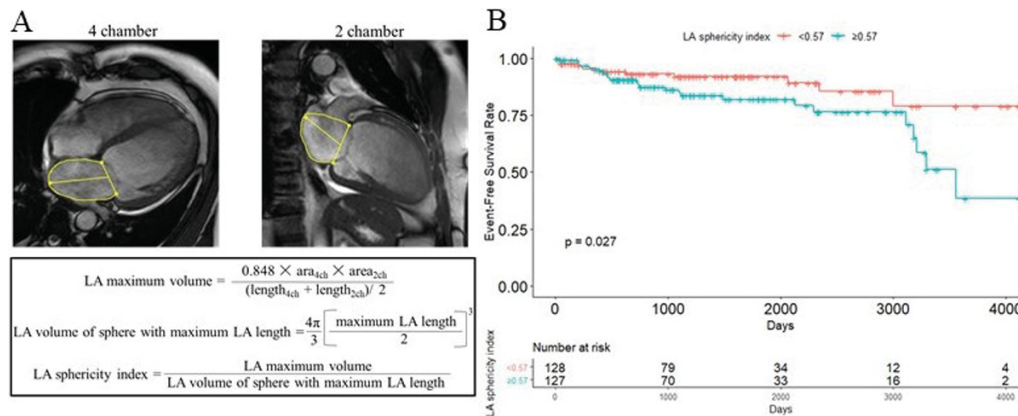


Figure 1