

# Evaluation of Left Atrial Dysfunction by Speckle Tracking Echocardiography in Systolic and Diastolic Heart Failure.

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## Abstract

**Aim:** to assess and evaluate the Left Atrial (LA) dysfunction by two-dimensional speckle tracking echocardiography (2DSTE) in patients with diastolic heart failure (DHF) and systolic heart failure (SHF). **Materials and methods:** The study included 74 patients with DHF, 26 patients with SHF, and 50 normal matched subjects. The LA phasic functions, LA volume index and E/e<sup>-</sup> were evaluated by conventional echocardiography. The 2DSTE used to evaluate both the left ventricular global strain (LVGS) and The Left Atrial Global Strain (LAGS) and reevaluate the LA phasic functions through Peak-atrial longitudinal strain (PALS), peak-atrial contraction strain (PACS), and PALS-PACS which reflecting LA reservoir, pump, and conduit function, respectively. **Results:** The LVGS was  $-19.54 \pm 1.42$  % in controls,  $-18.66 \pm 1.15$  % in DHF and  $-14.72 \pm 1.97$  % in SHF (P-value <0.0001); LAGS was  $52.62 \pm 6$  % in controls,  $37.86 \pm 4.59$  in DHF and  $21 \pm 5.37$  in SHF (P-value <0.0001); The PALS was  $49.9 \pm 4.83$  in controls,  $33.26 \pm 4.82$  in DHF and  $19.69 \pm 5.55$  in SHF (P-value was <0.0001); The PACS was  $20.19 \pm 2.25$  in controls,  $12.47 \pm 2.29$  in DHF and  $8.35 \pm 2.71$  in SHF (P-value <0.0001); The PALS-PACS was  $29.57 \pm 4.02$  in controls,  $20.76 \pm 3.8$  in DHF and  $11.35 \pm 3.14$  in SHF (p-value <0.0001). **Conclusion:** LA phasic function was worse in SHF compared with those with DHF. Early LA dysfunction in Heart failure can be detected accurately and easily by speckle tracking technique more than conventional echocardiography suggesting that The LA myocardial deformation analysis by 2-D STE could be a promising tool to better understand of heart failure and its classification. **Key words:** Speckle tracking; systolic heart failure; diastolic heart failure; left atrial dysfunction.

## Hosted file

LA dysfunction by STE in HF. main.docx available at <https://authorea.com/users/340992/articles/468040-evaluation-of-left-atrial-dysfunction-by-speckle-tracking-echocardiography-in-systolic-and-diastolic-heart-failure>

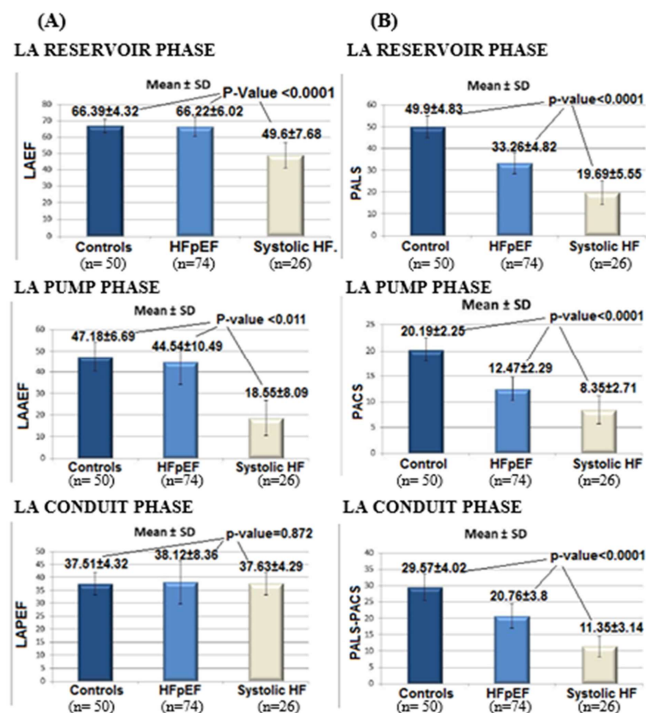
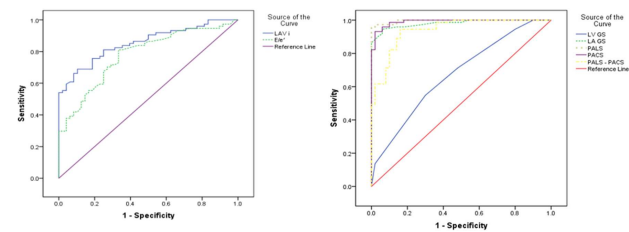


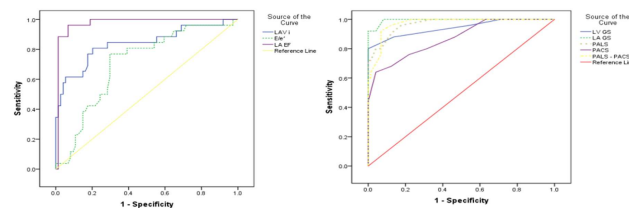
Figure 1: Comparison of LA Phasic function between overall patients with HFrEF (Systolic HF), HFpEF, and controls assessed by volumetric method (A) and by 2D speckle-tracking echocardiography (B).

HFpEF, heart failure with preserved ejection fraction; LA, left atrial; PACS, peak-atrial contraction strain; PALS, peak-atrial longitudinal strain.

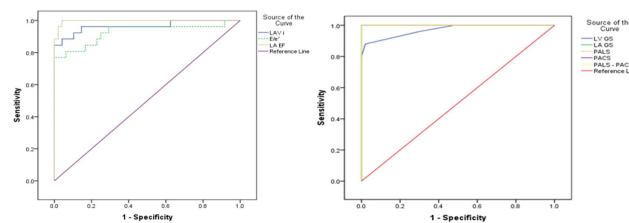
ROC Curve to discriminate LA dysfunction between control and HFpEF:



ROC Curve to discriminate LA dysfunction between DHF and SHF



ROC Curve to discriminate LA dysfunction between controls and SHF



**Figure 2: Receiver operating characteristic (ROC) curves and optimal cut off points for left atrial dysfunction in between different groups**

LAGS (Left atrium global strain), LVGS (Left ventricle global strain), LAVi (Left atrium volume index), LAEF (left atrium emptying fraction), E (early trans-mitral flow velocity), PALS (peak atrial longitudinal strain), PACS (peak atrial contraction strain), Post A refers to LA longitudinal strain at end of atrial contraction).