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## Relationship between left atrial deformation and B-type natriuretic peptide activation in asymptomatic aortic stenosis

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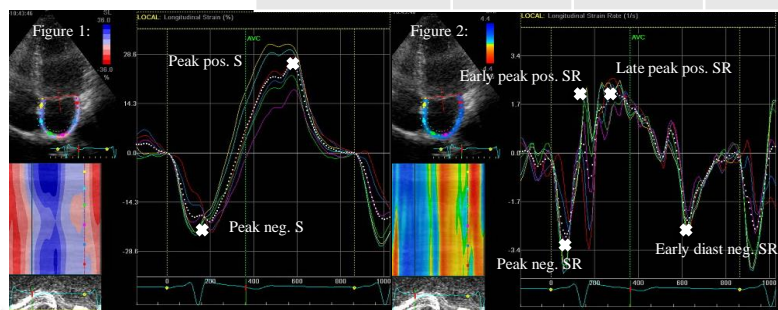
**Purpose:** ESC guidelines emphasize the usefulness of B-type natriuretic peptide (BNP) measurements in aortic stenosis (AS). The purpose of the present study was to determine the relationship between BNP activation and left atrial (LA) volumes (structural changes) and strain parameters (deformation).

**Methods:** We studied asymptomatic patients with  $\geq$  moderate AS and preserved left ventricular ejection fraction who underwent concomitant BNP level measurement and echocardiography in our Heart Valve Clinic. LA volumes were measured using Simpson method and strain parameters using speckle-tracking of the mid septal and lateral segments in apical 4-chamber view. Patients (n=23) were divided into 2 groups according to the median of BNP level (65pg/mL).

**Results:** Patients in the high BNP level group had a significantly lower peak negative strain, peak positive strain, late peak positive strain rate, and early diastolic negative strain rate. Significant correlations were found between peak negative strain ( $r=0.60$ ,  $p<0.01$ ), peak negative strain rate ( $r=0.47$ ,  $p=0.02$ ), peak positive strain ( $r=-0.45$ ,  $p=0.03$ ), late peak positive strain rate ( $r=-0.49$ ,  $p=0.02$ ), early diastolic negative strain rate ( $r=0.47$ ,  $p=0.03$ ) and BNP level. However, there was no difference for indexed and phasic LA volumes between the two groups.

	Low BNP	High BNP	p		Low BNP	High BNP	p
<b>LA strain parameters</b>				<b>LA volumes</b>			
				Ind syst, mL/m <sup>2</sup>	31 ± 13	33 ± 9	0.65
Peak neg. S, %	-16 ± 4	-12 ± 3	0.02	Ind diast, mL/m <sup>2</sup>	12 ± 7	14 ± 6	0.49
Peak neg. SR, s <sup>-1</sup>	-2.0 ± 0.9	-1.7 ± 0.5	0.37	Ind pre-A, mL/m <sup>2</sup>	19 ± 11	23 ± 7	0.36
Peak pos. S, %	15 ± 7	8 ± 4	0.01	Ind stroke, mL/m <sup>2</sup>	19 ± 7	19 ± 6	0.90
Early peak pos. SR, s <sup>-1</sup>	0.8 ± 0.4	0.7 ± 0.4	0.57	Ind passive, mL/m <sup>2</sup>	11 ± 5	10 ± 3	0.31
Late peak pos. SR, s <sup>-1</sup>	1.7 ± 0.4	1.2 ± 0.4	0.01	Ind active, mL/m <sup>2</sup>	7 ± 5	9 ± 4	0.33
Early diast neg. SR, s <sup>-1</sup>	-1.5 ± 0.5	-0.9 ± 0.3	0.01	Ind conduit, mL/m <sup>2</sup>	31 ± 11	24 ± 13	0.15

Figures: LA strain (1) and strain rate (2) curve using speckle-tracking in apical 4-chamber view



**Conclusion:** In AS, BNP activation is determined by LA functional changes as assessed by deformation imaging. Conversely, LA structural changes are not related to BNP release.