

**WALKING POSTER PRESENTATION**

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# Asymmetric myocardial thickening in aortic stenosis

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## Background

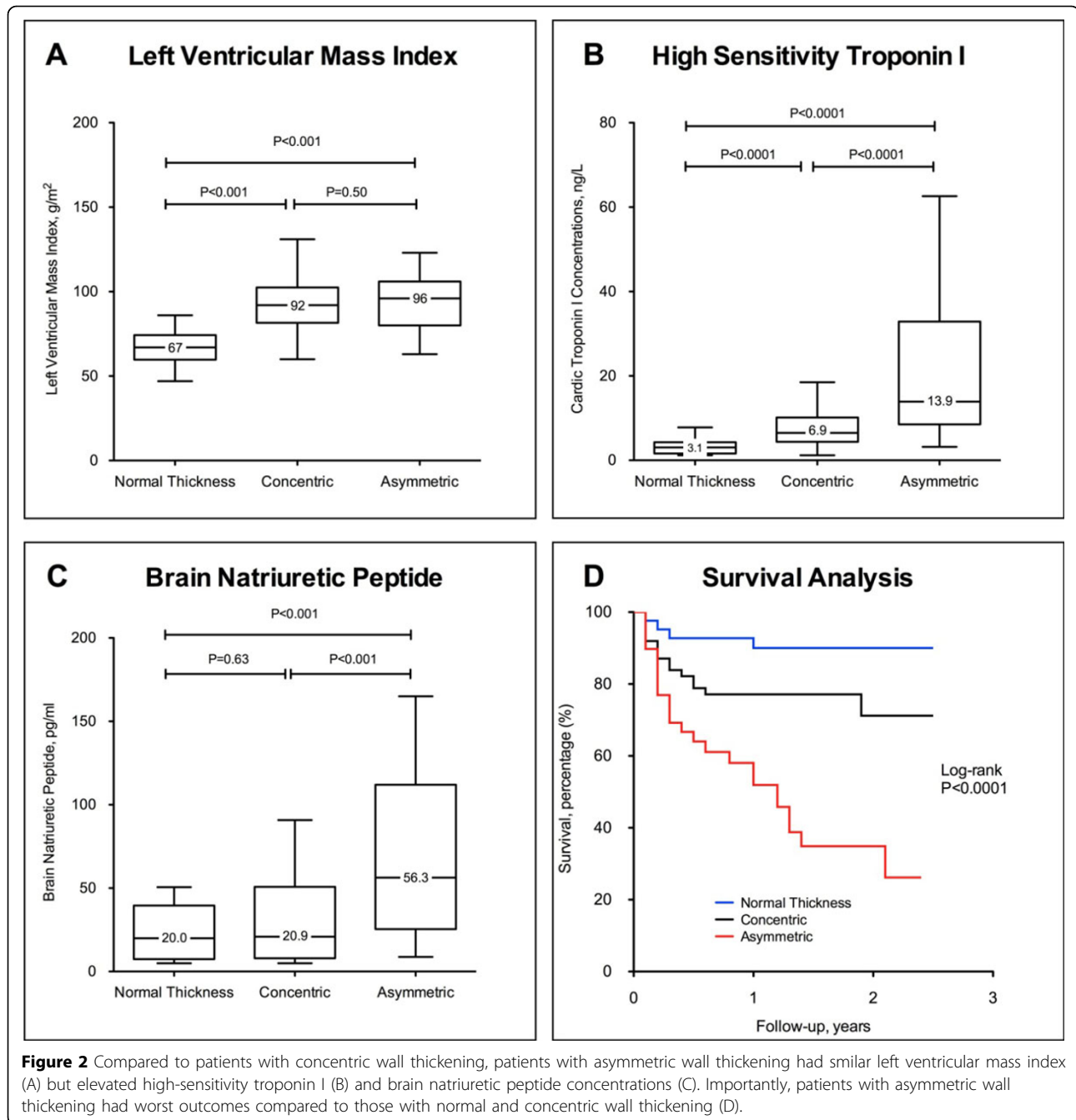
Asymmetric wall thickening has been observed in aortic stenosis (AS) but the clinical importance is poorly understood. We hypothesized this pattern was associated with advanced remodeling and worse outcomes.

## Methods

Left ventricular volumes, wall thickness and mass were assessed in 166 patients (70 [64, 76] years; 69% males) with cardiovascular magnetic resonance. Diffuse myocardial fibrosis was assessed using myocardial T1

	Concentric wall thickening (n=69)	Asymmetric wall thickening (n=43)	P value
<b>BASELINE CHARACTERISTICS</b>			
Age, years	70 [64, 77]	72 [67, 75]	0.41
Males, n (%)	54 (78)	31 (72)	0.60
Coronary artery disease, n (%)	22 (32)	20 (47)	0.18
Hypertension, n (%)	48 (70)	33 (77)	0.54
Systolic blood pressure, mmHg	150±20	153±22	0.46
<b>ECHOCARDIOGRAPHY</b>			
Peak aortic jet velocity, m/s	3.9 [3.4, 4.5]	4.2 [3.9, 4.9]	<0.01
Mean pressure gradient, mmHg	35 [24, 44]	41 [35, 50]	<0.01
Aortic valve area, cm <sup>2</sup>	0.82 [0.70, 1.08]	0.80 [0.66, 0.98]	0.18
<b>CARDIOVASCULAR MAGNETIC RESONANCE</b>			
Indexed end diastolic volume (EDV), mL/m <sup>2</sup>	67 [60, 74]	68 [62, 78]	0.19
Indexed end systolic volume, mL/m <sup>2</sup>	22 [16, 26]	22 [18, 26]	0.50
Indexed stroke volume, mL/m <sup>2</sup>	44 [40, 52]	47 [41, 55]	0.26
Ejection fraction, %	68 [64, 72]	67 [64, 73]	0.93
Indexed left ventricular mass (LVMI), mg/m <sup>2</sup>	92 [82, 103]	96 [80, 106]	0.50
LVMI/EDVi (mg/mL)	1.33 [1.23, 1.56]	1.36 [1.21, 1.50]	0.50

**Figure 1** Baseline characteristics of patients with concentric and asymmetric wall thickening.



mapping (partition coefficient,  $\lambda$ ). In the absence of infarction, asymmetric wall thickening was defined as myocardial thickness  $\geq 13$  mm and opposing wall thickness ratio  $\geq 1.5$ . High-sensitivity cardiac troponin I (cTnI) and brain natriuretic peptide (BNP) concentrations were used as markers of myocardial injury and decompensation, respectively. Aortic valve replacement and all-cause mortality were assessed at 1 year.

## Results

Compared to patients with concentric wall thickening ( $n=69$ ), those with asymmetric pattern ( $n=43$ ) had increased diffuse myocardial fibrosis ( $\lambda$  values  $0.48 \pm 0.04$  versus  $0.46 \pm 0.04$ , respectively;  $P=0.04$ ) despite similar age, sex, systolic blood pressure (SBP), and left ventricular mass index (LVMI; Table 1 and Panel A; all  $P>0.10$ ). Plasma cTnI and BNP concentrations were also increased independent of age, sex, SBP, AS severity and LVMI (both  $P<0.01$ ; Panels B and C). Patients with

asymmetric pattern had worst outcomes compared to those with concentric thickening and normal wall thickness (log-rank  $P < 0.0001$ ; Panel D).

### Conclusions

In aortic stenosis, asymmetric wall thickening is associated with ventricular decompensation and a worse prognosis.

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