Chin et al. Journal of Cardiovascular Magnetic Resonance 2015, 17(Suppl 1):Q49
http://www.jcmr-online.com/content/17/S1/Q49

Journal of Cardiovascular Magnetic Resonance

WALKING POSTER PRESENTATION Open Access

Asymmetric myocardial thickening in aortic stenosis

Calvin W Chin*, Emily N Yeung, Anoop S Shah, Scott Semple, Maria Koo, Nicholas Mills, David Newby, Marc R Dweck

From 18th Annual SCMR Scientific Sessions
Nice, France. 4-7 February 2015

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
BASELINE CHARACTERISTICS			
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
ECHOCARDIOGRAPHY			
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^2	0.82 [0.70, 1.08]	0.80 [0.66, 0.98]	0.18
CARDIOVASCULAR MAGNETIC RESONANCE			
Indexed end diastolic volume (EDV), mL/m^2	67 [60, 74]	68 [62, 78]	0.19
Indexed end systolic volume, mL/m^2	22 [16, 26]	22 [18, 26]	0.50
Indexed stroke volume, mL/m^2	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^2	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.

Centre for Cardiovascular Science, University of Edinburgh, Edinburgh, UK

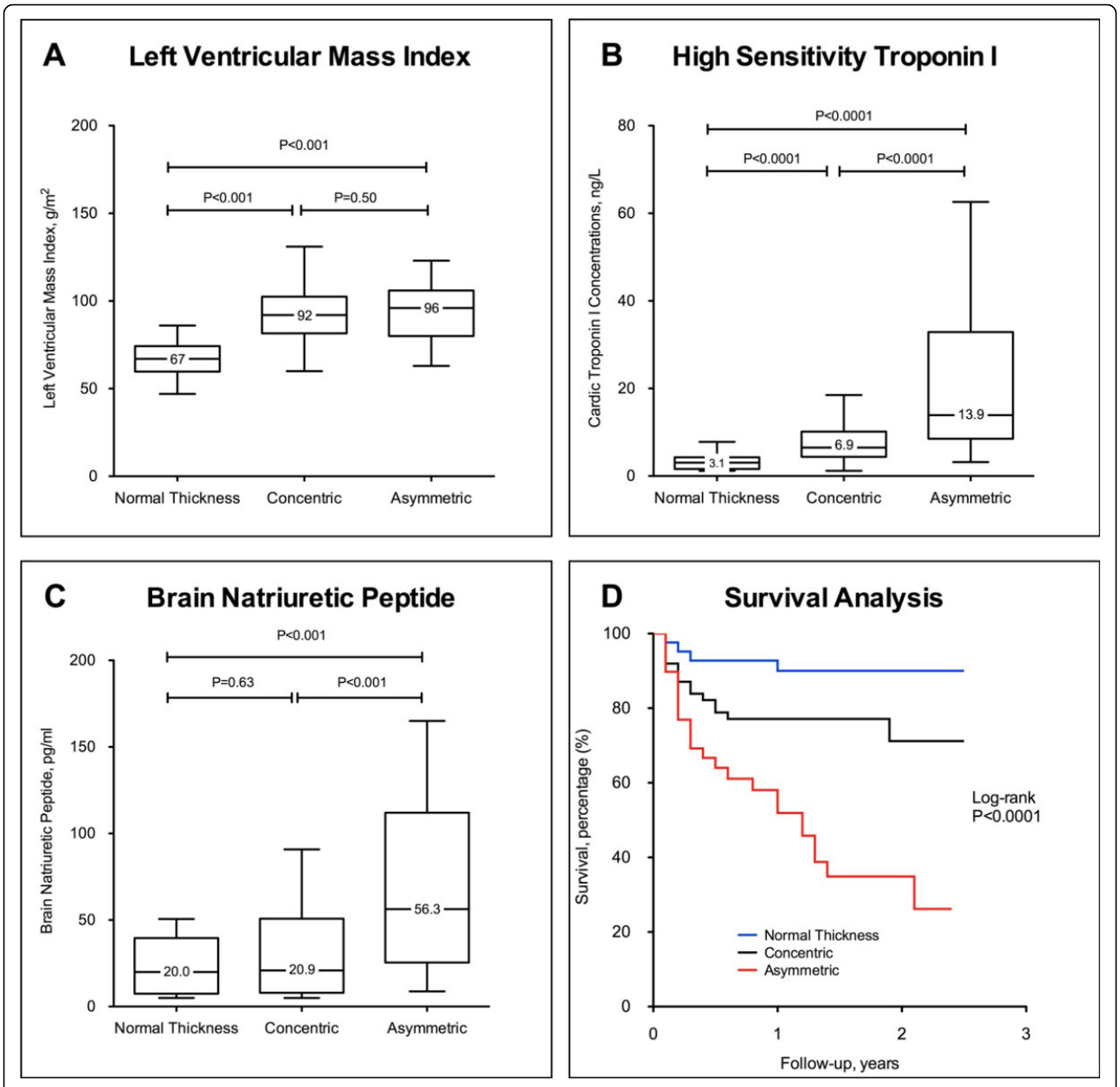

Figure 2 Compared to patients with concentric wall thickening, patients with asymmetric wall thickening had smilar left ventricular mass index (A) but elevated high-sensitivity troponin I (B) and brain natriuretic peptide concentrations (C). Importantly, patients with asymmetric wall thickening had worst outcomes compared to those with normal and concentric wall thickening (D).

mapping (partition coefficient, λ). In the absence of infarction, asymmetric wall thickening was defined as myocardial thickness ≥13 mm and opposing wall thickness ratio ≥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 (λ values 0.48±0.04 versus 0.46±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.

Funding

The study is supported by the British Heart Foundation.

Published: 3 February 2015

doi:10.1186/1532-429X-17-S1-Q49
Cite this article as: Chin *et al.*: Asymmetric myocardial thickening in aortic stenosis. *Journal of Cardiovascular Magnetic Resonance* 2015 **17** (Suppl 1):Q49.