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LEFT VENTRICULAR REMODELLING IN BARIATRIC PATIENTS: STUDY WITH 4D ECHOCARDIOGRAPHY AND STRAIN

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Purpose The aim of this study was to examine left ventricular (LV) echocardiographic indices, 4D volumes and ejection fraction of bariatric patients ($BMI > 40$).

Methods Forty-nine consecutive normotensive bariatric patients (31 women (63.2%), 43 Caucasian, mean age: 45.7 ± 9.7 years, $BMI \geq 40 \text{ kg/m}^2$) were examined with 3D and speckle tracking echocardiography pre-bariatric surgery and they were compared with an age-matched group of 30 healthy volunteers. Exclusion criteria were coronary artery disease, cardiomyopathies and arrhythmias. Statistical analysis was performed with SPSS V14.0 and Medcalc softwares. All indices were indexed to body surface area and heart rate, where appropriate.

Results Common comorbidities comprised diabetes mellitus ($N=7$), fatty liver ($N=8$), hypertension ($N=8$) and sleep apnoea ($N=12$). 2D echocardiography demonstrated dilatation of the left atrium in bariatric patients when compared to healthy volunteers (39.2 ± 1.9 vs 32.3 ± 2.6 mm, $p < 0.01$); LV end-diastolic diameter was increased (49.2 ± 4.8 vs 42.9 ± 3 mm). 4D values demonstrated an increase in LV end-diastolic volume (182.5 ± 47.7 vs 116.1 ± 15.9 ml); LV ejection fraction was preserved, however lower when compared to healthy volunteers (57.8 ± 7.4 vs $68.4 \pm 5.9\%$). LV mass was also greater in bariatric patients (107.5 ± 28 vs 84.7 ± 11.6 grs). When performing strain with Echopac, there was a contraction delay of global strain in bariatric patients when compared to healthy volunteers ($p < 0.05$).

Conclusions Bariatric patients demonstrate increase of LV mass, dilatation of the ventricle and signs of diastolic heart failure with preserved ejection fraction.