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POSTER PRESENTATION

EFFECTS OF WEIGHT LOSS INTERVENTIONS ON CARDIAC STRUCTURE AND FUNCTION IN PATIENTS WITH HEART FAILURE: AN UMBRELLA REVIEW

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18 systematic reviews pooled

−31.27 g LV mass bariatric surgery

−7.05 mL LA volume GLP-1 RA / GIP-GLP-1

+3.43% absolute GLS bariatric surgery

−1.11 epicardial fat SMD exercise

BACKGROUND

Obesity is a major driver of heart failure and worsens its trajectory through adverse left ventricular remodelling, atrial enlargement, diastolic dysfunction and epicardial adiposity. Whether intentional weight loss reverses this cardiac phenotype — and which interventions do so most effectively — remains unresolved.

METHODS

- Umbrella review and meta-analysis of systematic reviews reporting cardiac imaging or invasive haemodynamic outcomes after intentional weight loss in adults with overweight or obesity and heart failure.
- Effect estimates pooled within seven pre-specified intervention classes using DerSimonian–Laird random-effects models.
- Methodological quality appraised with AMSTAR-2.

RESULTS

- 18 systematic reviews were identified.
- Bariatric surgery produced the greatest reverse remodelling: LV mass −31.27 g ($p<0.001$), LVEDV −14.49 mL, LA diameter −2.01 mm, LVEF +1.64% and absolute GLS +3.43%.
- GLP-1 RA / dual GIP-GLP-1 therapy reduced LV mass (−5.88 g, $p=0.006$), LVEDV (−5.28 mL, $p=0.014$) and LA volume (−7.05 mL, $p<0.001$; $I^2=0\%$), without change in LVEF or GLS.
- Diet reduced LV mass (−4.31 g, $p<0.001$) but increased LVEDV (+6.30 mL).
- Exercise produced the largest reduction in epicardial adipose tissue (SMD −1.11).

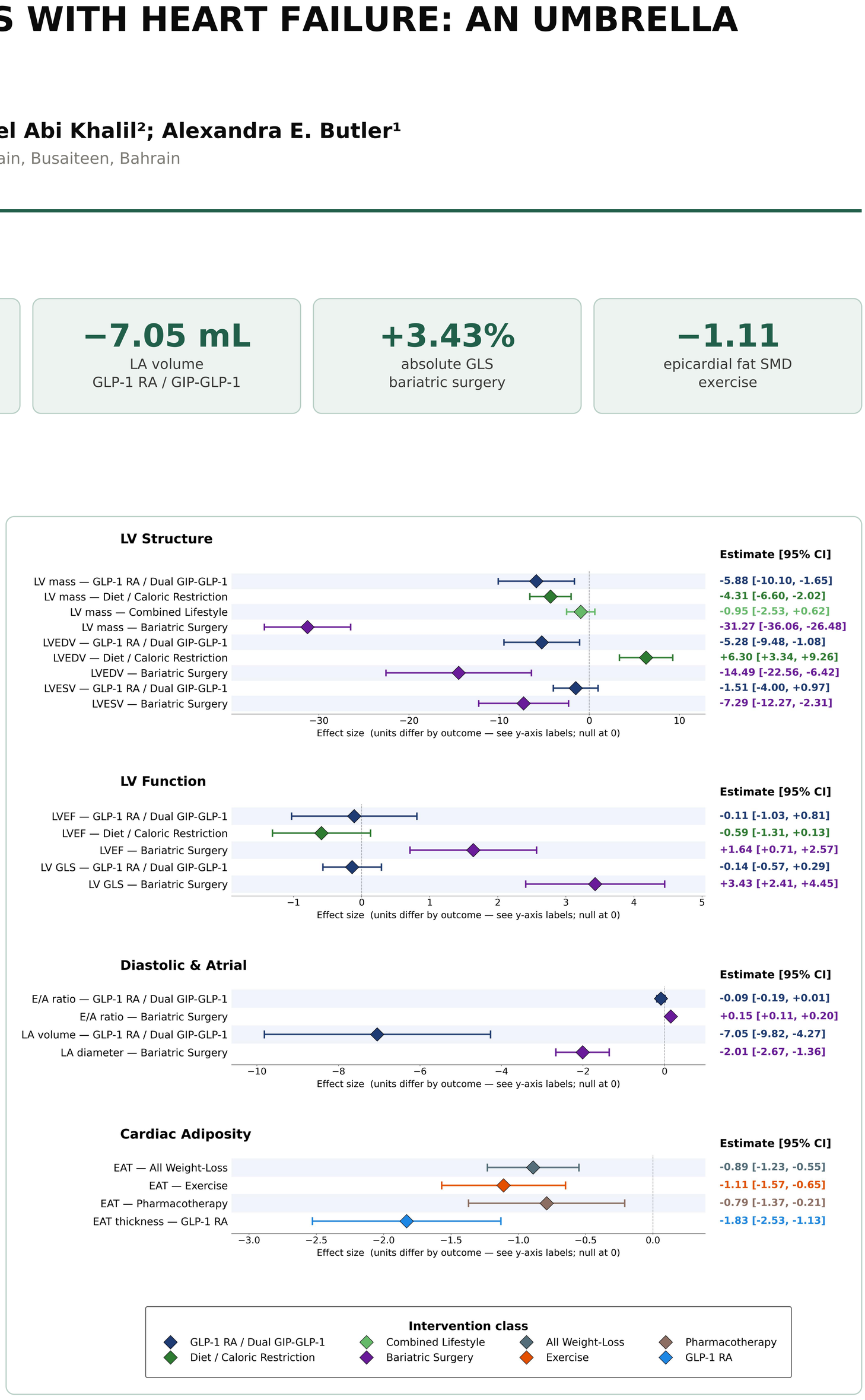


Figure 1. Pooled effect estimates by intervention class across four cardiac domains. Units differ by outcome — see row labels; null at 0. Bars are 95% confidence intervals.

CONCLUSIONS

Weight loss consistently improves LV mass, atrial size and cardiac adiposity without compromising systolic function. Effects are class-specific: bariatric surgery maximises structural regression; GLP-1 agents remodel the atrium; exercise uniquely targets epicardial adipose tissue.

LV = left ventricular. LVEDV = left ventricular end-diastolic volume. LVESV = left ventricular end-systolic volume. LVEF = left ventricular ejection fraction. GLS = global longitudinal strain. LA = left atrial. EAT = epicardial adipose tissue. SMD = standardised mean difference. GLP-1 RA = glucagon-like peptide-1 receptor agonist. GIP = glucose-dependent insulinotropic polypeptide. Funding: none. Conflicts of interest: none declared.