

Impact of Bariatric Surgery on Left Ventricular Ejection Fraction in Patients with Heart Failure

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Introduction

There are an estimated 6 million Americans aged over 20 years living with heart failure (HF), and this number is projected to increase to >8 million by 2030 [1]. Obesity is one of the strongest risk factors for developing HF [2], and according to a large study of Framingham Heart Study participants, the risk of HF increases by 5% in men and 7% in women for every 1 kg/m² increase in body mass index (BMI) [3].

Several studies have shown that bariatric surgery is safe in patients with HF [7-10], and improves their eligibility and access to transplantation [4-6]. In some cases, bariatric surgery has been shown to eliminate the need for cardiac transplantation altogether [5]. With the increasing use of durable left ventricular assist devices (LVADs) in the treatment of HF, evidence is emerging regarding the successful use of bariatric surgery in patients with LVADs [17-19]. The effects of nonsurgical bariatric intervention (i.e., medical weight loss management, dietary restrictions) compared with bariatric surgery have not been well characterized in patients with HF and LVADs.

Aim

To evaluate cardiac function and body mass index (BMI) in patients with obesity and heart failure presenting for bariatric management at our institution. Compare outcomes between surgically treated and non-surgically treated managed patients, assessing differences in left ventricular ejection fraction (LVEF) and BMI. Additionally, to examine outcomes in patients with LVADs.

Methods

We conducted a retrospective study reviewing the electronic medical records of 25 patients with HF and a BMI of 27 kg/m² or more between 2019 and 2025. Patients were stratified into surgically treated and non-surgically treated managed cohorts. Patients were further categorized from a cardiac standpoint based on whether they had a durable LVAD or other advanced heart failure therapy (AHFT). Changes in LVEF and BMI before and after bariatric intervention were evaluated. Statistical significance of differences in mean pre- and post-intervention LVEF and BMI between cohorts was assessed using paired t-tests.

Results

Twenty five patients were included in the study. The cohort included 20 male patients (80%) and 5 female (20%). Surgical procedures included 11 sleeve gastrectomies and one Roux-en-Y gastric bypass. The non-surgical group was composed of 13 patients. Within the surgically treated group, only one patient (8.4%) had a LVAD and eleven (91.6%) were being treated with AHFT, meanwhile the nonsurgical cohort 9 (69.2%) had an LVAD and 4 (21.8%) were on AHFT. Mean LVEF in patients undergoing surgical bariatric procedures was 18.75% before intervention and 26.58% after surgery, reflecting an 7.8% absolute increase. 58% of the patients had an increase of their LVEF after bariatric surgery while three (25%) had their LVEF worsened. In patients on AHFT who were treated with surgical bariatric intervention, mean LVEF increased from 19.77% pre-surgery to 28.09% post-surgery, reflecting an 8.3% absolute increase. In the nonsurgical cohort, LVEF was reduced from 20.88% pre- intervention to 19.07% post-intervention.

	LVEF before bariatric intervention	LVEF after bariatric intervention	<i>P</i> value	Initial visit BMI	BMI at first follow up after bariatric	<i>P</i> value
Total patients (n = 25)	19.86	22.68	0.3931	41.59	37.66	0.0804
Surgical patients (n = 12)	18.75	26.58	0.1670	44.28	38.07	0.0002
Nonsurgical patients (n = 13)	20.88	19.07	0.6317	39.11	37.27	0.0652
LVAD/surgical patients (n = 1)	7.5	10		42.28	37.45	
LVAD/nonsurgical patients (n = 9)	17.94	15.33	0.6017	39.81	38.09	0.2130
AHFT/surgical patients (n = 11)	19.77	28.09	0.1803	44.46	38.13	0.0005
AHFT/nonsurgical patients (n = 4)	27.5	27.5	1	37.54	35.425	0.1236

Table 1. LVEF and BMI before and after bariatric intervention in each of the cohorts

Conclusions

Bariatric surgery is safe among patients with HF and obesity. While LVEF improvement was not statistically significant, its increase after bariatric surgery may still highlight a plausible treatment option for improvement of left ventricular function in patients with obesity and HF.

Bariatric surgery was a more effective means of reducing BMI and improving LVEF than nonsurgical bariatric intervention.

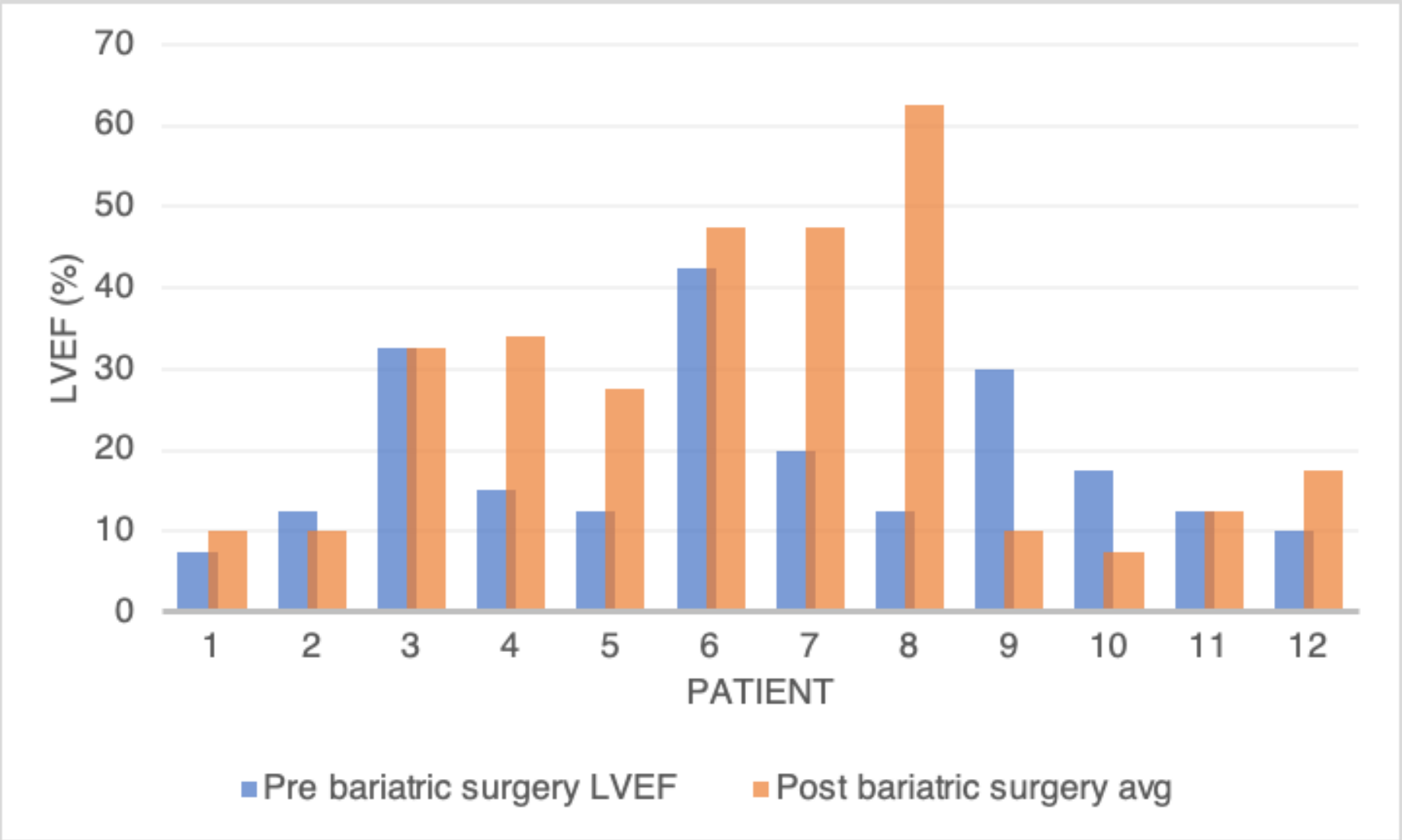


Figure 1. LVEF before and after bariatric surgery

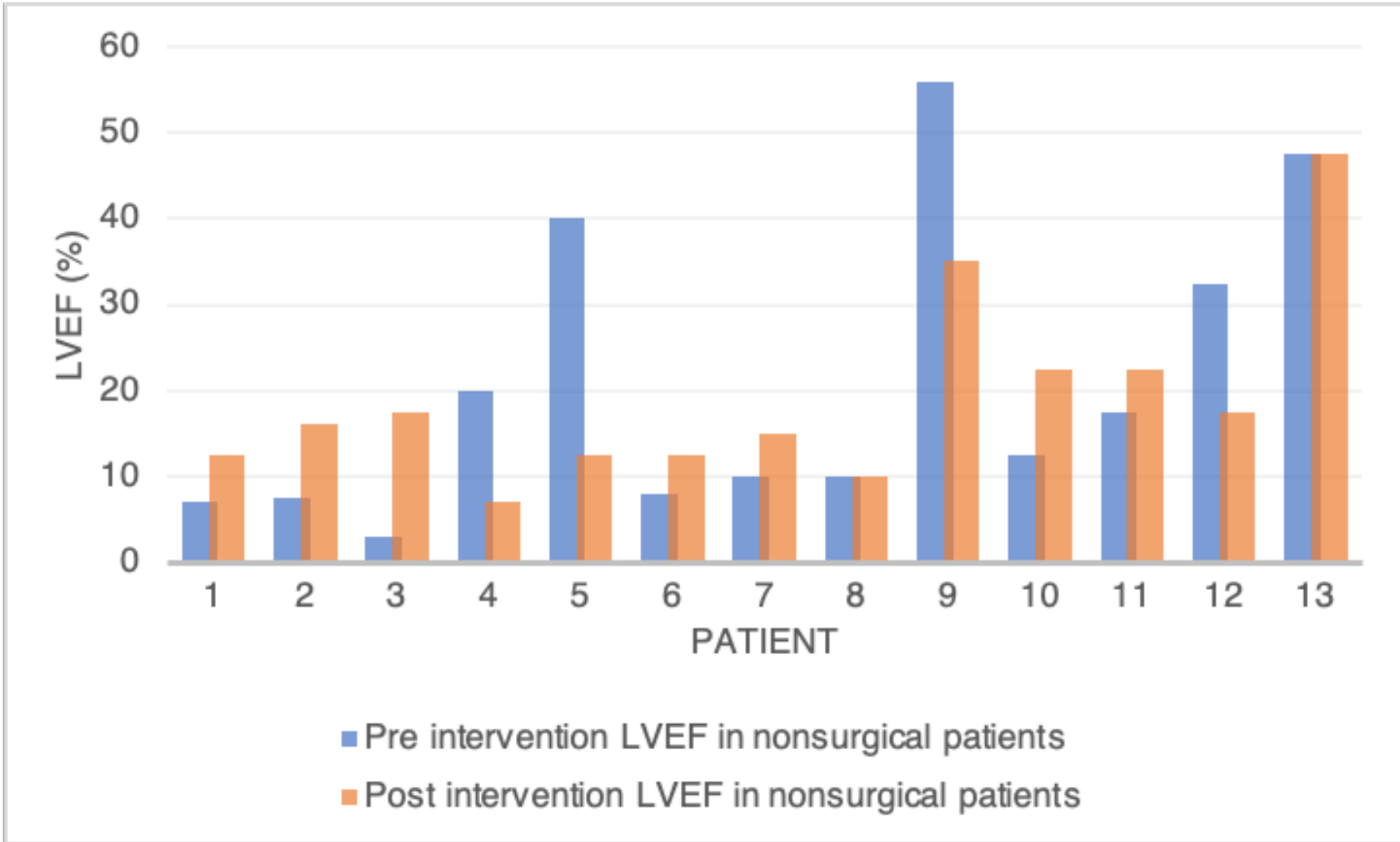


Figure 2. LVEF before and after bariatric intervention in nonsurgical patients

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