Laparoscopic sleeve gastrectomy in patients with advanced heart failure: A retrospective review and systematic literature search with pooled analysis

Trevor D. Crafts M.D., Ryland S. Stucke, M.D., Farah A. Husain, M.D., Andrea M. Stroud M.D. M.S.

Department of Surgery, Oregon Health & Science University, 3181 SW Sam Jackson Park Rd, Mail Code: L223A, Portland, OR, 97239, USA.

BACKGROUND

Obesity is a risk factor for heart failure and a relative contraindication for cardiac transplant. Evidence from case reports and small series support bariatric surgery for weight loss in cardiac transplant candidates with obesity.

METHODS

A retrospective cohort analysis was performed for patients with advanced heart failure who underwent bariatric surgery from 2014 – 2020 at a single academic institution. We performed a systematic literature review for all publications reporting outcomes after bariatric surgery in patients with advanced heart failure. Institutional and pooled analyses of the data were conducted using descriptive statistics.

RESULTS

Six patients (4 men) with advanced heart failure and morbid obesity underwent laparoscopic sleeve gastrectomy (LSG) at our institution from 2014 – 2020 (Table 1). Median age was 47 (27-58) and median pre-operative BMI was 45.9 ± 4.0 kg/m^2. All patients had New York Heart Association class 3 or 4 heart failure. Three patients (43%) had a left ventricular assist device at the time of surgery. Median ICU length of stay (LOS) was 1.5 (0-4) days, while median overall LOS was 4 (1-8) days. No immediate perioperative complications occurred. One patient was readmitted within 30 days for recurrent ventricular tachycardia. At last follow-up (median = 55mo), median post-operative BMI was 34.8 (+/-4.3) kg/m^2.

RESULTS (cont.)

All patients lost sufficient weight to qualify for transplant. Four patients underwent cardiac transplantation, 1 patient remains listed for transplant, and 1 patient died in the follow-up period unrelated to bariatric surgery (Table 2). A systematic literature search yielded 16 retrospective case reports or series, including 58 patients. Series are small (median *n*=2.5), and inclusion criteria are heterogeneous. In studies prior to 2014, gastric bypass and gastric band were preformed, while LSG was performed in more recent reports. One 2020 case series reports on outcomes after intra-gastric balloon. Weight loss was comparable to other bariatric surgery series (median pre-operative BMI = 43.7 ± 2.9 kg/m^2, median post-operative BMI =32.4 ± 2.0 kg/m^2). Time between bariatric surgery and transplant ranged from 5-25 months. Median LOS was 9 days. Thirty-day complications were low; 4 bleeding events (6.8%) and 1 staple line leak (1.7%) were reported.



Table 1. Laparoscopic sleeve gastrectomy subjects

Subject	Age	Sex	BMI Preop (kg/m^2)	LVAD Pre-op	ICU LOS	Overall LOS	Transplant BMI (kg/m^2)
1	27	M	50.3	-	2	4	35.7
2	39	M	52.4	-	1	4	36.4
3	42	M	42.8	Yes	2	8	39.2
4	56	M	45.2	Yes	4	7	32.4
5	52	F	43.6	-	0	1	25.4
6	58	F	41.3	-	0	3	33.8

Table 2. Heart failure parameters

Subject	NYHA Class	EF Preop (%)	Heart transplant	LSG to heart transplant interval (months)	Vital Status	EF Recent (%)
1	3	25-30	Yes	19	Alive	70%
2	3	20	-	-	Deceased	-
3	3	<20	Yes	7	Alive	55-60%
4	4	<20	-	-	Alive	<20%
5	3	60-65	Yes	17	Alive	60%
6	3	20-25	Yes	35	Alive	>65%

CONCLUSIONS

Our series supports the safety and efficacy of LSG in patients with advanced heart failure and severe obesity. Pooled analysis also supports these conclusions. LSG is currently favored. Novel endoscopic weight-loss procedures represent an area for future research.