Single-Institution Experience Using Sleeve Gastrectomy Bridging LVAD to Transplant

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Introduction

Heart failure is a growing health problem in the United States affecting roughly 6.2 million (1). Currently, heart transplantation is the best treatment for end-stage heart failure (2). These patients will often need mechanical assistance prior to transplantation, typically as a left ventricular assist device or LVAD (2). Due to lack of organ availability, LVADs are used as a bridge therapy and occasionally are the only intervention available, particularly if the patient has significant comorbidities that preclude them from listing (2).

Morbid obesity is an increasingly prevalent disorder with multiple associated comorbidities, including heart failure (3). Unfortunately, BMI >35 kg/m2 is associated with worse outcomes following heart transplantation including longer waiting times, less likelihood of finding a suitable donor, and an increase in post-transplant morbidity and mortality (4). In fact, the International Heart and Lung Transplantation (ISHLT) guidelines in 2016 recommend weight loss to BMI <35 prior to transplant (4).

Bariatric surgery has been accepted as the best method for weight loss in morbidly obese patients, however, its safety and efficacy in patients with LVADs has not been well established. Our retrospective case-control study sought to analyze a sub-group of LVAD patients who would be denied listing for heart transplant due to BMI > 35.

Methods

Following approval by our institutional review board, chart review identified patients with BMI >35 who underwent LVAD implantation from 1/2010 to 1/2019. These patients were then grouped by their obesity treatment modality: medical (LVAD-Only) versus surgical with laparoscopic sleeve gastrectomy (LVAD w/ LSG). Patients who underwent LSG after their heart transplant were excluded.

LSG patients were evaluated pre-operatively by a multidisciplinary team and deemed eligible for a surgical weight loss procedure. A protocol was developed by the Cardiac Surgery, Bariatric Surgery and Heart Failure Cardiology team to allow for anticoagulation management and preoperative optimization.

Demographics of each group were compared. Patient BMI before LVAD placement, BMI at time of LSG, and time-to-transplant were noted. Additionally, information pertaining to their weight loss over time, transplant listing status, reason for transplant listing denial, post-op complications, and mortality, were analyzed.

Results

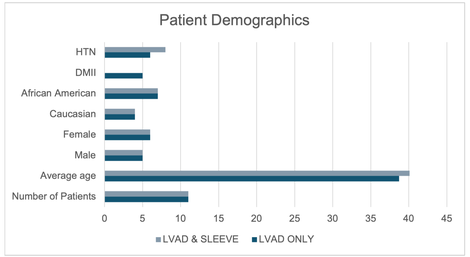


Table 1. Demographics of both groups.

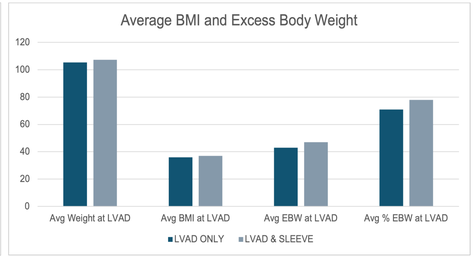


Table 2. Comparison of patient BMI and excess body weight.

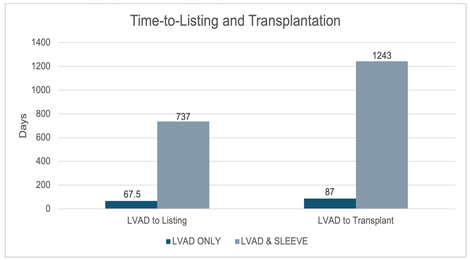


Table 3. Days from date of listing to date of transplant.

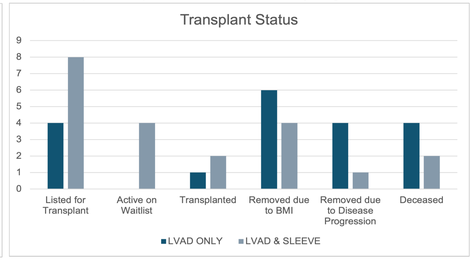


Table 4. Status regarding transplantation or transplantation listing for both groups.

Twenty-two patients who underwent LVAD placement with BMI >35 kg/m^2 were identified: 11 underwent LSG and 11 received only medical management for obesity. Demographics as seen in Table 1 compared included age, comorbidities, race, and BMI. Between the two groups, diagnosis of DMII differed significantly (45% LVAD only, 0% LSG, p=0.0155). Of note, there was no significant difference in BMI or EBW. Table 2. The average number of days to meet the transplant listing threshold of BMI <35 was found to be significantly longer in the LVAD-LSG group (Avg 67 vs 737, p=0.001).

Table 3 lists transplant status of the two groups including the number initially listed for transplant, the reasons they were removed from the transplant list including their BMI, disease progression or other.

For the LSG patients, there were two post-operative complications, both anemia requiring transfusion. There were no deaths within 30 days of LSG. Average weight loss for LSG patients was -8.55 BMI vs –1.24 in LVAD Only (p=0.001) .

Discussion

Left ventricular assist devices have traditionally been used for mechanical circulatory support in end-stage heart failure patients (2). While LVADs can extend life and reduce time-to-list mortality, LVADs are associated with significant adverse effects, including increased risk of bleeding, infection, and weight gain with long-term use (2). Given their increased risk of post-operative complications, LVAD patients have traditionally not been considered candidates for elective general surgery, including weight loss surgery (5).

For severely overweight patients with LVADs, BMI can be a significant barrier to heart transplant eligibility (6). It has been well established that bariatric surgery is an appropriate intervention for weight loss in morbidly obese patients (6). In other studies, bariatric surgery has been shown to improve cardiac function and extend life (5). The improvement of comorbidities and reduction in weight through bariatric surgery can serve as an opportunity for morbidly obese patients with LVADs to improve their chances of transplantation.

We have found that in a select population LSG is a safe and effective option for weight loss to help bridge morbidly obese LVAD patients to heart transplant. Lap Sleeve Gastrectomy improved the odds of listing, transplant, and decreased chance of denial due to weight and disease progression.

References

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