

Original Research Article

5 Year Follow-up for Laparoscopic Adjustable Gastric Band as a Revision Surgery for Failed Vertical Gastric Sleeve or Roux-en-Y Gastric Bypass Procedures


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Abstract

Background: In the field of bariatric surgery, there has been a steady need to improve and standardize the surgical management of obesity. The Roux-en-Y Gastric Bypass (RYGB) and Laparoscopic Vertical Sleeve Gastrectomy (LVSG) have been the most preferred methods. However, the probability of failure of these procedures has been documented and should not be understated. Thus, many revision procedures are being explored.

Aim: The aim of this study was to follow up on patients 5 years post adjustable band placement proceeding either a failed gastric sleeve or RYGB procedure. This was to determine whether the use of a gastric band can be offered as a sensible option for patients as a revision procedure.

Materials and methods: A retrospective review was conducted on all bariatric patients who underwent a laparoscopic adjustable gastric band (LAGB) from April 2014 to April 2017. In total, 18 patients were analyzed. These included 12 patients who underwent LAGB from a retrospective study conducted in 2017 that were then divided into a group of 8 who had failed LVSG (Group A) and a group of 4 who had failed RYGB (Group B). We identified and included a group of 6 extra patients who met the criteria and underwent band over bypass procedures (Group C) that were not included in the original study. These patients were operated on by the same physician and followed the same postoperative protocol as those in the original study.

Results: All groups underwent LAGB as a revision procedure with no complications. Group A had a mean estimated 2 year weight loss (EWL) of 30.75 lbs. with a mean BMI 40.7 kg/m². Group B had a mean 2 year EWL of 42 lbs with a mean BMI 36.77 of kg/m². Group C had a mean 2 year EWL of 35.44 with a mean BMI of 39.56. The 18 patients were followed for 5 years post LAGB with regular scheduled appointments. Group A had a EWL of 18.31 with a mean BMI 44.02 kg/m². Group B had a mean EWL of 47 and a mean BMI 36 kg/m². Group C had an EWL of 60 with a mean BMI of 30.6 kg/m². Group A had an Excess Body Weight Loss (EBWL) of 33% at the 2 year follow up. Group B had an EBWL of 42.2% and Group C had an EBWL of 45.1%. 5 years post LAGB, Group A had a mean EBWL of 20.174, Group B had an EBWL of 43.63, and Group C had an EBWL of 61.95.

Conclusion: Applying a LAGB as a revision over a failed bariatric procedure can be immensely useful for a select group of patients who meet the criteria. Our follow up study showed a mean estimated weight loss of all treatment groups of 41.7 lbs over the course of 5 years, with LAGB over RYGB yielding the most promising results. For future analysis, larger sample sizes with more diverse subjects should be conducted to minimize confounding factors.

Key words

Laparoscopic Adjustable Gastric Band, Roux-en-Y Gastric Bypass (RYGB), Laparoscopic Vertical Sleeve Gastrectomy (LVSG), Estimated Weight Loss (EWL), Body Mass Index (BMI), Excess Body Weight Loss (EBWL).

Introduction

Over the past few decades, population demographics, high-calorie food choices and disease dynamics have been continuously evolving. Alongside, obesity has evolved to become one of the most important public health crises in the United States, next to heart disease. Nearly 42.4% of the adult population in the United States suffer from obesity, with a BMI > 30 kg/m², with 9.2% of that population suffering from severe obesity with a BMI ≥ 35 kg/m² [1]. With the rapidly expanding statistical data of obesity, medical advancements and treatment options have further developed. In the field of bariatric surgery, there is extensive research at the clinical level to improve and standardize medical and surgical management of obesity [2]. Of many surgical methods, the Roux-en-Y Gastric Bypass (RYGB) and Laparoscopic Vertical Sleeve Gastrectomy (LVSG) have been the most common and preferred [3]. The LVSG accounts for 59.4% of all bariatric procedures performed in the US while the RYGB comes in second with 17.8% [4, 5]. All such bariatric procedures are indicated only in patients when lifestyle modifications, diet plans and prescription medications have failed.

The primary goal of RYGB and LVSG surgical procedures is to reduce body weight in the long-term. The success rates for weight loss averages of RYGB and LVSG are 65.0% and 62.7%, respectively within the first year of receiving the procedure [6, 7]. Despite these success rates, long term complications, failures and weight regain have been reported. RYGB is associated with approximately 25% weight loss failure while LVSG reports with a 35.2% weight loss failure [8, 9]. Alternative treatments and revisions for the RYGB and LVSG have been studied but of importance, a study conducted in 2012 concluded that in the case of insufficient weight loss or pouch failure after RYGB, a further increase in weight loss was reported after a laparoscopic adjustable gastric band (LAGB, salvage banding) was placed. It was reported and suggested that LAGB is a safe feasible revisional procedure [10]. LAGB over LVSG is a more rare procedure but another study conducted in 2017 showed favorable results for LAGB as a revisional surgery for LVSG failures [11].

In this study, the comparisons of LAGB placement over RYGB and LVSG are made to show weight loss reduction over the course of

four years. The goal is to further demonstrate the placement of LAGB aiding in continual weight loss without complications or co-morbidities, post failure of RYGB and LVSG procedures.

Materials and methods

A retrospective review was conducted of all bariatric patients who underwent a laparoscopic adjustable gastric band (AGB) from April 2014 to April 2017. The main inclusion criteria were patients who had an LAGB placed over a failed vertical sleeve gastrectomy (LVSG) or patients who had an LAGB placed over a failed Roux-en-Y gastric bypass (RYGB). A failed LVSG or RYGB is defined as a patient's postoperative body mass index (BMI) $\geq 35\%$ or a patient's postoperative weight that has been regained, both within 24 months following the surgery.

In total, 18 patients were analyzed. These included 12 patients who underwent LAGB from a retrospective study conducted in 2017 that were then divided into a group of 8 who had failed LVSG and a group of 4 who had failed RYGB [11]. We included a group of 6 extra patients who met the criteria and underwent band over bypass procedures and 1 patient who underwent the band over sleeve procedure that were not included in the original study. These patients were operated on by the same physician and followed the same postoperative protocol as those in the original study.

All 18 patients were offered other treatment options including surgical approaches. All 18 patients are middle aged females. They were all counseled on diet modifications: such as high protein, low carbohydrate intake that consisted of fish, eggs, vegetables, fruits, and a moderation of red meat. They were told to avoid anything soft, crunchy, or chewy such as the use of condiments, dressings, gravy, and sauces. In addition, they were told to avoid carbonated drinks. Patients were encouraged and reminded to take a daily multivitamin to avoid vitamin deficiencies.

All patients confirmed their understanding of what is expected of them following the LAGB revision. As a follow up to the 2017 study, all patients were followed for five years post LAGB placement.

Results

All LAGB procedures from April 2014 to April 2017 were reviewed at our surgery center. This resulted in a total of 400 patients. Among these, 18 patients had the LAGB as a revision procedure for failed LVSG or RYGB procedures. All 18 of the patients are females. Our study divided the patients into three groups: Group A which had 8 patients who had failed LVSG. Group B which had 4 patients with failed RYGB. Group C which had 6 patients who met the criteria that were not included in the original study. Group A had 8 patients with a mean pre-revision weight of 287 lbs with a mean BMI of 46.91 kg/m². Group B had 4 patients with a mean pre-revision weight of 272.75 lbs and a mean BMI of 43.05 kg/m². Group C had 6 patients with a mean pre-revision weight of 274.4 lbs and a mean BMI of 45.06 kg/m².

All groups underwent LAGB as a revision procedure with no complications. Group A had a mean estimated 2 year weight loss (EWL) of 30.75 lbs (11%) with a mean BMI 40.7 kg/m².

Group B had a mean 2 year EWL of 42 lbs (15%) with a mean BMI 36.77 of kg/m². Group C had a mean 2 year EWL of 35.44 with a mean BMI of 39.56. The 18 patients were followed for 5 years post LAGB with regular scheduled appointments. Group A had a EWL of 18.31 with a mean BMI 44.02 kg/m². Group B had a mean EWL of 47 and a mean BMI 36 kg/m². Group C had an EWL of 60 with a mean BMI of 30.6 kg/m².

Group A had an Excess Body Weight Loss (EBWL) of 33% at the 2 year follow up. Group B had an EBWL of 42.2% and Group C 45.1%. 5 years post LAGB Group A had a mean EBWL of

20.174, Group B had an EBWL of 43.63, and Group C had an EBWL of 61.95.

Discussion

In the field of weight loss management and bariatric surgery, LVSG and RYGB remain the most common surgical procedures with the LAGB procedure coming in as the second most common procedure performed. Although the LVSG and RYGB procedures are safe and effective approaches to the treatment of morbid obesity, weight management and weight regain can be possible outcomes with further potential complications. Failure after such bariatric surgery is defined as achieving or maintaining \leq 50% of excess weight loss (EWL) over 18-24 months or having a body mass index (BMI) of \geq 35 [12]. According to previous literature, the failure rate of RYGB is around 15% with a long-term failure of 20-35% and a revision rate of 4.5% [13]. Statistical evidence shows a failure rate of about 35.2% for the LVSG with a revision rate of 4.7% [8, 14]. In conjunction with these failure rates, the female gender has been reported to be a predictive factor for poor weight loss. According to a 2017 study, females regained 24.38% of their lost weight while males regained only 16.15% [15].

The plausible connections as to why these surgical procedures failed is multifactorial. Anatomically, an enlargement of the gastric pouch or the presence of a gastro-gastric fistula can lead to complications in the loss of caloric restriction [16]. Adherence to highly strict lifestyle and dietary schedules is imperative. Poor compliance to such regimen needs to be focused on and monitored with behavioral and nutritional counseling for optimal benefits and to reduce such weight regain. In addition, psychological and mental conditions need to be assessed. A previous study found that patients with two or more psychiatric diagnoses were significantly more likely to experience weight loss failure or weight regain after 1 year relative to those with only one psychiatric diagnosis [17]. Furthermore, each individual patient should be

considered for hormonal imbalances and regulation. The pathologic regulation of ghrelin is most prominent in patients who are morbidly obese. The long-term levels of ghrelin slowly increase, especially postprandially, even after having a RYGB or LVSG procedure which could potentially be associated with weight regain [18]. Lastly, as with any surgical procedure, a high importance should be placed on patient follow up. In a 2014 study, the non-adherence rate to follow-up visits after bariatric procedures was 17.5% [19] which contributed to their poor weight loss and weight regain. Despite the patient experiencing external reasons for non-adherence, patient follow-up should be well monitored and enforced for their bariatric procedures to maintain favorable outcomes.

In this retrospective study, the measurement of Excess Body Weight Loss (EBWL) was primarily used to show the results. This parameter is the most sensitive identification to report weight loss after bariatric procedures. Of a total of 400 patients, this study focused on 18 patients, all of whom were female. Following the LAGB revision procedure over the LVSG, Group A showed an EBWL of 33% at the 2 year follow up and 20.174% at the 5 year follow up. Following the LAGB revision procedure over the RYGB, Group B showed an EBWL of 42.2% at the 2 year follow up and 43.63 % at the 5 year follow up. Group C showed an EBWL of 45.1% and 61.95%, at the 2 year and 5 year follow ups respectively.

The sample size of this study was small, including only 18 out of 400 patients, however, compared to Group A, Group B had a more favorable EBWL. Including this sample size and having the criteria of the patients being female could have led to limitations of the results displayed. Group C included 6 patients that were not included in the original study, but still met the criteria. These patients all underwent Band over Gastric Bypass surgery. By the addition of these 6 extra patients, the power of the original study that only had 4 band over bypass patients was further strengthened. For future analysis,

larger sample sizes over a longer time period should be conducted to minimize confounding factors.

Conclusion

Applying a LAGB as a revision over either a failed gastric sleeve or RYGB can be immensely useful for a select group of patients who meet the criteria. Our follow up study showed a mean estimated weight loss of all treatment groups of 41.7 lbs over the course of 5 years, with LAGB over RYGB yielding the most promising results. For future analysis, larger sample sizes with more diverse subjects should be conducted to minimize confounding factors.

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