

Original Research Article

# Laparoscopic Adjustable Gastric Band as a Revision Surgery for Failed Vertical Gastric Sleeve or Roux-en-Y Gastric Bypass

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## Abstract

**Background:** Bariatric surgery is seen as one of the most successful option for the control of morbid obesity and obesity related complications. Although, there are many surgical options available the

laparoscopic vertical sleeve gastrectomy and the Roux-en-Y gastric bypass are among the most selected treatment methods. Even though the sleeve gastrectomy and the gastric bypass has proven to be efficacious in weight reduction in morbid obesity there are still some reported failures.

**Aim:** This study main objective is to see if an adjustable gastric band can be offered as a sensible option for patients who have had a previously failed vertical sleeve gastrectomy or the Roux-en-Y gastric bypass surgery. The procedure will be classified as a revision surgery to increase the possibilities of additional weight loss not achieved with the sleeve gastrectomy or gastric bypass surgery alone.

**Method:** A retrospective review of the charts for all the bariatric patients from April 2012 to April 2017 was conducted. The chart review yielded 12 patients who underwent either adjustable band over a previously failed vertical sleeve procedure or the adjustable band over a previously failed Roux-en-Y gastric bypass procedure. The patients were divided into two groups, group A and B. Group A is comprised of the 8 out 12 patients who had a previous failed gastric sleeve procedure. Group B has the remaining 4 patients who had a failed gastric bypass procedure.

**Observation:** Both groups who underwent adjustable gastric band laparoscopically as a revision procedure after a two year follow up appointment showed Group A had a mean estimate weight loss of 30.75 lbs. (11%) with a mean Body Mass Index of 40.7 kg/m<sup>2</sup> and Group B had a mean estimate weight loss of 42 lbs. (15%) with a mean Body Mass Index of 36.77 kg/m<sup>2</sup>. Group A had an Excess Body Weight Loss of 27% at 1 month and 33% at the 2 year follow up and Group B had an Excess Body Weight Loss of 42.2%. Group B had an Excess Body Weight Loss of 15.1 % at 1 month and 42.2% at the 2 year follow up.

**Conclusion:** Group A had an average of 27% Excess Body Weight Loss and Group B had an Excess Body Weight Loss of 15.1% after 1 month on follow up. Our study was limited by the small sample size. We suggest that further investigational studies, with greater and more diverse sample sizes, be conducted to assure the benefit of using the adjustable gastric band as a revision surgery. Based on our results we conclude that the adjustable gastric band as a revision surgery is a promising and sensible alternative treatment option for patients with a previously failed laparoscopic vertical sleeve gastrectomy or a failed Roux-en-Y gastric bypass.

## Key words

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Laparoscopic, Adjustable Gastric Band, Revision surgery, Vertical Gastric Sleeve, Roux-en-Y Gastric Bypass.

## Introduction

Obesity has become a major public health problem in the United States. According to the World Health Organization, more than 1.9 billion people are overweight (2014), of which 600 million people are obese (body mass index BMI>30 kg /m<sup>2</sup>) [1]. The Center for Disease Control and Prevention (CDC), has estimated that the annual medical cost of obesity in the U.S. was \$147 billion in 2008 U.S. dollars; the medical costs for people who have obesity were \$1,429 higher than those of normal weight [2].

There are various treatment options available for the control of morbid obesity, which include both surgical and non-surgical modalities. Although, there are many options, previous data support bariatric surgery as the most successful method to decrease obesity-associated comorbidities and to decrease overall weight [3]. Among the surgical methods available, the laparoscopic vertical sleeve gastrectomy (VSG) and the Roux-en-Y gastric bypass (RYGB) are the most preferred method (45.9%, 39.6% respectively) in all the regions (USA/Canada, Europe, and Asia/Pacific) according to the International Federation for the Surgery of Obesity and

Metabolic Diseases (IFSO) worldwide survey published in 2014 [4]. The major goal of bariatric surgery in long-term excess body weight reduction is approximately 62%, 68% for VSG and RYGB respectively [5]. However, despite their success in the weight reduction, the laparoscopic VSG and RYGB procedures have almost the same reported failure rate and long-term complications over a few years after the surgery [6].

VSG is a relatively recent development, and, thus, there are few publications with limited data and controversies exist in the literature for the revision of the VSG. Some authors suggest that the laparoscopic re-sleeve gastrectomy is an alternative treatment of weight regain after sleeve gastrectomy [7, 8]. Other authors reported good results with conversion of the sleeve gastrectomy to RYGB [9, 10]. On another hand, various surgical options for weight regain after RYGB have been previously described [11-15]. Of note, a systematic literature review concluded that the adjustable gastric band (AGB) placed around the RYGB pouch was a safe and effective revision operation for a failed RYGB operation [16]. AGB was designed to either reduce the volume of the stomach to restrict food intake and induce earlier satiety offering a promising way for the achievement the further weight loss and reduced the complication rate for the patients who failed in VSG.

In this study, we compared AGB placed over VSG or around the RYGB pouch to aid in further weight loss and reduction of long-term complications to further evaluate our surgical achievements on lap-band over a VSG or RYGB.

## **Materials and methods**

A retrospective review of all bariatric patients from April 2012 to April 2017 was conducted. The main inclusion criterion is that the patients had an AGB placed over a failed VSG or a failed RYGB surgery. A VSG or a RYGB is defined as “failed” under two conditions. First, is when a patient's’ postoperative body mass index (BMI)

is >35% or they regained their previously lost weight, both within 24 months following the RYGB surgery. 12 patients were identified as having a failed bariatric surgery per our inclusion criteria. 8 out of the 12 patients had a failed VSG and the other 4 had a failed RYGB. All 12 of the patients were offered other treatment options including other surgical approaches. All 12 patients were middle aged females with a past medical history significant only for morbid obesity. All patients agreed to have the AGB done laparoscopically by the same physician and understood that the band is a restrictive procedure requiring at least some degree of discipline to be successful. The patients were informed that the risks related the the AGB included severe vomiting, reflux, band infection, slippage, erosion, torsion, leaks, and some port related complications such as slippage or infection.

The patients were subsequently educated and counselled on diet modifications and other life changes to promote healthy weight loss. The patients were told to follow a high protein/ low carbohydrate diet consisting of meat (red meat in moderation), fish, eggs and vegetables. Patients were told to avoid fried or breaded food, to limit the use of condiments and to avoid salad dressings, mayonnaise, gravy and sauces. Snacking was highly discouraged due to extra and empty calories. Patients were also counselled on avoiding carbonated drinks because they are unhealthy and they may cause the AGB to slip, possibly requiring surgical intervention. Patients were reminded to take a daily multivitamin to avoid any vitamin deficiencies. All patients confirmed their understanding of what is expected of them following the AGB revision procedure. All 12 patients were followed for a period of two years after the placement of the AGB.

## **Results**

A thorough research for all AGB procedures done within the database from April 2012 to April 2015 at our surgery center yielded a total of

400. Among the 400 patients, 12 (3%) had the AGB as a revision procedure for a failed VSG or RYGB. All 12 of the patients are females. 11 patients of African American decent and 1 patient of Caucasian descent. The mean age was 42 with the youngest patient being 30 and the oldest being 50. Our study divided our patients into two groups, group A had a failed VSG and group B had a failed RYGB. Group A had 8 patients with a mean pre-revision weight of 287 lbs with a mean BMI of 46.91 kg/m<sup>2</sup>. Group B had 4 patients with a mean pre-revision weight of 272.75 lbs and a mean BMI of 43.05 kg/m<sup>2</sup>.

Both groups underwent AGB laparoscopically as a revision procedure with no complications. Group A had a mean estimate weight loss (EWL) of 8 lbs. (3%) with a mean BMI 45.81 kg/m<sup>2</sup> and Group B had a mean EWL of -2lbs (one patient gained 33lbs) and a mean of BMI 43.55 kg/m<sup>2</sup> one month following AGB as revision procedure. The 12 patients were followed for two years after the AGB with regular scheduled appointments. The two years follow up appointment showed Group A had a mean EWL of 30.75 lbs (11%) with a mean BMI of 40.7 kg/m<sup>2</sup> and Group B had a mean EWL of 42 lbs (15%) with a mean BMI of 36.77 kg/m<sup>2</sup>. Group A had an Excess Body Weight Loss (EBWL) of 27% at 1 month and 33% at the 2 year follow up and Group B had an EBWL of 42.2%. Group B had an EBWL of 15.1% at 1 month and 42.2% at the 2 year follow up.

## Discussion

VSG and RYGB are among the most common bariatric procedure performed while the gastric banding procedure is the second most common procedure in in the United States. The gastric bypass procedure has an effective weight loss of 68.9% after 2 years compared to the band with an estimated weight loss (EWL) of 67.5% over the same period [17]. Although, the procedure is usually a success, weight regain can be extremely difficult to manage. The failure of the RYGB is defined as weight regain and potential complications. A study conducted in 2009,

showed that treatment failure for gastric bypass was 15.3% and 23.3% for gastric banding with a female gender being a significant predictive factor for poor weight loss after gastric banding [17]. The exact mechanism for why the RYGB fails is still somewhat unknown. However, previous literature on the subject gives some possible explanation for the significant weight regain. The top four possibilities are anatomical, behavioral, psychological and hormonal/metabolic [18]. The first explanation examined diameter enlargement of the gastric pouch and gastrojejunostomy which is seen in 70% of regain compared to control [19]. Behavior habits were studied and showed that the failure to comply with dietary recommendations following the procedure is one of the main reason for weight regain post-surgery. Several studies have shown that binge, and grazing eating habits are two major independent predictors of AGB failure [20, 21, 22]. Patient mental health is another major consideration of RYGB failure. In a study of 60 veterans, researchers found that patients with 2 or more psychiatric conditions were 6.4 times more likely to have significant weight regain on year after bariatric surgery when compared to patients with one or no psychiatric conditions [23].

To monitor the progress of the patients we used a measure of Excess Body Weight Loss (EBWL). EBWL tracks progress taking into account an ideal body weight at patients given height with a BMI of 25. Subtracting the patient's ideal weight from their starting weight will give you a 100% EBWL goal. If patients gained weight they were not taken into account for this calculation, rather they are discussed separately.

On average, Group A showed an 8 lbs weight loss 1 month following the revision surgery with the AGB over the VSG and an additional 30.75 lbs weight loss with the AGB over VSG revision at the 2 year appointment. Group A had an average 27% EBWL at 1 month follow up and an additional 33% EBWL with revisional surgery at the 2 year follow up. Group B gained an initial 3

lbs with revisional surgery, this includes one patient that gained 33lbs, and lost an average of 44.25 lbs after 2 years with revisional surgery. EBWL was an average of 15.1% with revision at 1 month follow up and 42.2% EBWL after 2yr follow up.

Comparatively Group B had better EBWL than Group A but it is worth mentioning that both groups have a small sample size. This small sample size and the fact that all patients were females can lead to limitations such as selection bias and skewing of the results.

## Conclusion

The AGB as a revision to a failed bariatric surgery can be safely offered to a selected group of patients that have met certain criteria. Although our study had a limited number of patients as a sample size it still generated a mean excess weight loss of 15%. The result of the study suggests that AGB is a promising procedure that can be used to promote weight loss in patient with previously failed bariatric procedure. However, further research with greater sample size is warranted to exclude any possible confounding factors.

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