



Laparoscopic MGBP after removal of gastric Band

Mohamed Magdy MD, Sherif Abd ELHalim M.D. MRCS

General Surgery Department, Faculty of Medicine, Ain Shams University, Cairo, Egypt
mmagdy25@hotmail.com

Abstract: Background: Obesity is considered one of the leading causes of death around the world, obesity is considered as one of the most serious public health problem of the 21st century. Obesity can be treated using surgical or non-surgical approaches. During the last 20 years, laparoscopic gastric banding have been one of the most successful approaches of bariatric surgery. However, more than 40% of LAGB procedures have been associated with many side effects and long term complications and failure. In cases of failed LAGB surgery, many surgeons have recommend the conversion to laparoscopic mini gastric bypass. **Aim of the work:** To study the assess the success of the laparoscopic mini gastric bypass (LMGB) operations as a revisional bariatric procedure after the failure of the gastric binding operations, and to study the beneficial effects of this procedure on the quality of life of the patients. **Material and methods:** This study was conducted in Ain Shams University Surgery Hospital in Cairo between November 2015 and June 2018. Patients underwent laparoscopic mini gastric bypass operation as a revisional procedure after the failure of LAGB operation. The exclusion criteria was for the patients to have previous bariatric surgery, or other surgery and cases with insufficient necessary data. **Results:** The mean hospital stay time after the revision was 4.23±3.2 days. There was a statistically significant difference in the BMI of the patients after 6 months. After 6 months of the surgery we found a significant decrease in the number of the diabetic patients. The number of patients with sleep apnea dropped significantly. All of the patients with GERD were cured. **Conclusions:** We found that the conversion of failed LAGB to LMGB is considered to a safe and easy procedure to perform. Patient satisfaction was high, and recovery time was short. We also reported further significant weight loss and decreased comorbidities after the revision surgery.

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Keywords: Laparoscopic; MGBP; removal; gastric Band

1. Introduction:

Obesity is considered one of the leading causes of death around the world, obesity is considered as a worldwide epidemic causing more death than starvation and it is viewed it as one of the most serious public health problem of the 21st century (1). Severe obesity is defined as having a body mass index (BMI) of more than 35 kg/m², while the morbid obesity is having a body mass index greater than 40 kg/m² or a BMI greater than 35 kg/m² with concomitant obesity-related morbidity (2). Obesity can be treated using surgical or non-surgical approaches. The non-surgical techniques have many disadvantages like the noncompliance of the patients, and the non-satisfactory results. Another problem is the weight regaining after the success of the nonsurgical techniques. Regarding the morbidly obese patients, surgical options are considered to be the lone option which guarantee satisfactory, long-term weight loss. (4)

During the last 20 years, laparoscopic gastric banding have been one of the most successful

approaches of bariatric surgery (5). However, more than 40% of LAGB procedures have been associated with many side effects and long term complications and failure, which indicates revision or conversion of the LAGB surgery (5-8). Many studies have discussed the effects of re-banding and found it to be associated with poor results, and high possibility of failure (9). In cases of failed LAGB surgery, many surgeons have recommend the conversion to either Roux-en-Y gastric bypass (RYGB), sleeve and duodenal switch (DS), there still is a huge discussion regarding the surgery of choice to be done after the failure of LAGB surgery (9-11).

There are many indication to convert the operation including many problems regarding the placement of the band like leakage, slippage, intragastric migration, obstruction and necrosis. Other reasons to convert the operation include motility problems, inadequate weight loss, gastroesophageal reflux disease (GERD) and the effect of the banding over the quality of life of the patient (12-15). Laparoscopic mini-gastric bypass (LMGB) is

considered to be a safe, affective and relatively easy rescue operation to perform in cases of failure LAGB procedures, LMGB was first describe in 2001 (16), and was found to be associated with excellent results both as a primary bariatric operation (16–20) and as a revisional surgery (21, 22).

Aim of the work:

To study the assess the success of the laparoscopic mini gastric bypass (LMGB) operations as a revisional bariatric procedure after the failure of the gastric binding operations, and to study the benefiuctual effects of this procedure on the quality of life of the patients.

2. Material and methods:

This study was conducted in Ain Shams University Surgery Hospital in Cairo between November 2015 and June 2018. 42 patients underwent laparoscopic mini gastric bypass operation as a revesional procedure after the failure of LAGB operation. The exclusion criteria was for the patients to have previous bariatric surgery, or other surgery and cases with insufficient necessary data.

Pre-operative preparation of the patients included history taking focusing on age, sex, weight, BMI, Dietary habits, history of previous operations. All the patients underwent full general examination, full abdominal examination checking for scars of previous operations or abdominal wall hernias.

General pre-operative laboratory investigations for all the patients included full blood count, prothrombin and thromboplastin time, liver function tests, albumin, liver AST, ALT, serum urea, serum creatinine, sodium and potassium, free T3, T4, TSH, Fasting blood sugar and HBA1C.

Pre-operative investigations were ECG, CXR. Patients with cardiovascular troubles had ECHO. Patients with respiratory troubles as sleep apnea underwent respiratory function test and arterial blood gases. A pre-operative pelvi-abdominal ultrasound was done to all patients to see any intra-abdominal

and pelvic organ pathologies. A lower limbs' Doppler ultrasound were performed on all patients. A psychological evaluation of all the patients was done pre-operatively.

Surgical details:

During the laparoscopic conversion to LMGB operation, At the laparoscopic conversion to MGB, the gastric band was first divided and removed. (Figure 1) The LMGB was then performed. A window was created to enter the lesser sac between the vagus nerve and the lesser curvature just proximal to the antrum. Through the window created, a 60 mm Endo-GIA was passed horizontally and then vertically to the axis of stomach, and fired, creating a gastric tube, upward to the angle of His (under 36 Fr nasogastric tube guidance). (Figure 2) No short gastric vessels were divided. At this stage, a graded grasper was used to measure about 180–240 cm of jejunum from the ligament of Treitz according to the preoperative BMI of the patient.

An antecolic terminolateral gastrojejunostomy was then performed with a linear 60 mm Endo-GIA [20]. (Figure 3) The residual orifice was closed with continuous manual suture with Vicryl 2/0. The tubing and access port were also removed. Intraoperative methylene blue test for leak was performed in every patient.

A nasogastric tube was left in place and it was removed onpostoperative day 1, when a clear liquid diet was begun. Early postoperative ambulation was strongly encouraged, with patients walking by day 1. Patients were discharged on postoperative day 3 or 4 after performance of a normal Gastrografin contrast study. At discharge, a clear explanation on detailed dietary guidelines (pureed food for 3 weeks, solid food by the 4th postoperative week) was provided. Patients received a prescription of multivitamins, minerals and proton pump inhibitor. Follow-up was scheduled for 1, 3 and 6 months postoperatively, and then every 6 months.

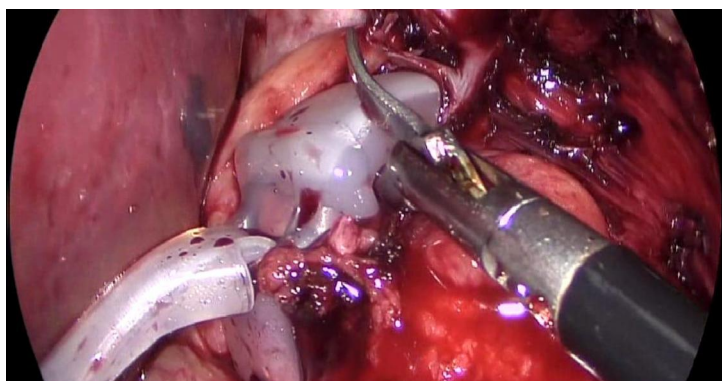


Figure 1

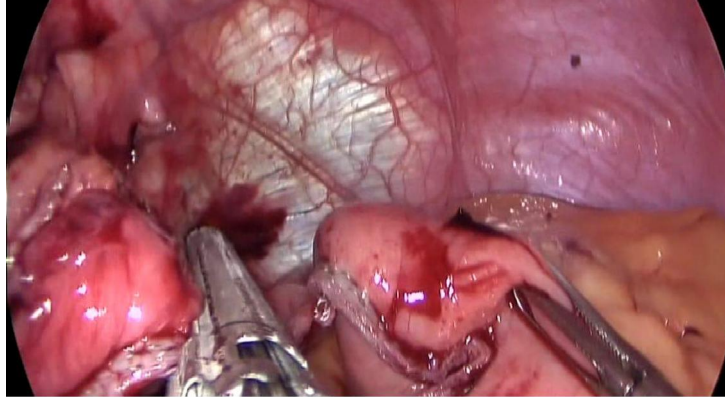


Figure 2

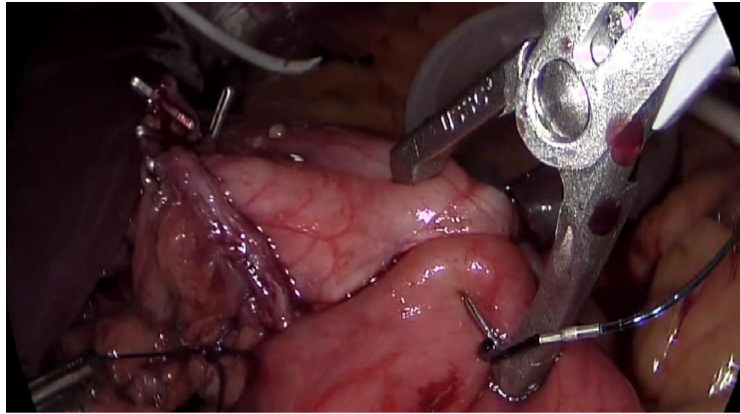


Figure 3

Statistical analysis

Statistical analysis was performed using SPSS 23.0. The continuous variables were presented as mean \pm SD and 2-tailed t-test, and the categorical variables were presented using the χ^2 and as a ratio or number of cases. A comparison between the variables was done using the one-sample test. Post-operative was considered statistically significant if its value was less than 0.05.

3. Results:

The total number of patients included in our study was 42 patients, of whom 33 patients (78.57%) were females, and the other 9 patients (21.42%) were males. The mean age of the patients was 39.32 ± 2.68 years (range 25-61). Table (1): patient's demographics.

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		No. = 42	Test value	P-value	Sig.
Age	Mean \pm SD	39.32 \pm 2.68	0.319	0.752	NS
	Range	25-61			
Gender	Female	33 (78.57%)	0.784	0.376	NS
	Male	9 (21.42.0%)			

P-value > 0.05: Non significant; P-value < 0.05: Significant; P-value 0.01: Highly significant; NA: Not applicable

The main cause to perform a revisional LMGB was found to be band related complications, followed by GERD, then inadequate weight loss. Table (2): cause of revisional surgery.

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	No. = 42	P-value
Band-related complications	19 (45.5%)	NA
GERD	13 (30.9%)	NA
Weight loss failure	6 (14.2%)	NA
Food intolerance	4 (9.5%)	NA

The revision of the operation was done after a mean duration of 26.3 months after the initial operation. The mean hospital stay time after the revision was 4.23 ± 3.2 days. After a period of 60 days, the total number of mortalities was 1 patient.

There was a statistically significant difference in the BMI of the patients after 6 months (35.3 ± 2.97 kg/m²) comparing to the BMI before the revisional LMGB (44.6 ± 3.9 kg/m²) $P > 0.001$. After 6 months of the surgery we found a significant decrease in the

number of the diabetic patients (2 patients), comparing to 7 patients before the revisional surgery. The number of patients with sleep apnea dropped from 8 to 3 patients, and 6 out of 12 patients were still presented with hypertension after the surgery) $P > 0.001$. All of the patients with GERD were cured and were able to eat solid food again, with a significant improvement in the quality of life in the patients after- the revisional operation. Table (3): 6 months difference in BMI and comorbidities.

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	Before the revisional operation	After 6 months	P-value
BMI (kg/m²)	44.6 ± 3.9	35.3 ± 2.97	$P > 0.001$
Hospital stay (days)	4.23 ± 3.2		NA
Type II diabetes	7 (16.6%)	2 (4.7%)	$P > 0.001$
Sleep apnea	8 (19%)	3 (7.14%)	$P > 0.001$
Arterial hypertension	12 (28.57%)	6 (14.2%)	$P > 0.001$

P-value > 0.05 : Non significant; P-value < 0.05 : Significant; P-value 0.01: Highly significant; NA: Not applicable

4. Discussion

Since the 1990s, the laparoscopic gastric banding operation has become very popular as it is considered to be a non-invasive and reversible operation (23,24). Recently, due to the high 5 years failure rate in the LAGB operation (up to 50%), and high associated risk of complications (25,26), Most authors agree on the fact that a revision surgery is the best option in case of failure of LAGB, (27, 28) but there is still lack of significant data that can guide the surgeon in choosing the standard of revisional care. The re-banding option remains controversial in subjects with inadequate weight loss (12, 15). Most of the surgeons consider the option of a revisional surgery as a backup in cases of failure of operation or incidence of complications (27, 28). Mini-gastric bypass has been proved to be a valuable option according to the excellent results presented by Rutledge and Noun both as a primary bariatric operation and as a revisional procedure (16, 17, 19, 21, 22).

In our study, the total number of patients who underwent a revisional LMGB surgery during the period between November 2015 and June 2018 was 42 patients. In such cases of LAGB failure, we were looking for rescue operation which is considered to be safe and easy to perform, and associated with a guaranteed loss in weight and less complications. And the laparoscopic mini gastric bypass met all the previously mentioned criteria (17). Another advantage of the LMGB operations that it is associated with high incidence of remission of GERD symptoms, and other medical condition like diabetes and hypertension. In addition, LMGB has been considered a good choice in cases of revision surgery as it has shorter operating time and shorter hospital stay and easy revisability when compared to other types of operations.

In our study, the main cause of surgical conversion was band related complications like slippage, leakage and obstruction (45.5%), followed by the incidence of GERD symptoms (30.9%) and

inadequate weight loss (14.2%). Noun et al have found similar results where the most common cause of surgical revision was band slippage, followed by weight regain, reflux symptoms and unsatisfactory weight loss (22).

In our study, the mean hospitalization time in the revision surgery was 4.23 days. Vijgen et. al reported similar results where he reported a mean time of hospitalization of 3.53 days in cases of LMGB surgery after gastric banding operations (26).

In our results, we found a significant difference in the BMI of the patients after the revision LMGB operation where the Initial mean BMI was 44.6 (kg/m²) before the operation comparing to 35.3 (kg/m²) after 6 months of the operation $P > 0.001$. Vijgen et. al reported similar results where he reported an initial BMI of 43.2±5.1 (kg/m²) compared with a mean BMI of 34.5±6.2 (kg/m²) during follow up after 6 months.

In our results we found a significant difference in the percentage of other accompanied medical condition such as diabetes (16.6% Vs. 4.7%), sleep apnea (19% Vs. 7.1%) and hypertension (28.5% Vs. 41.2%) $P > 0.001$. such differences could be due to the effective loss of weight after the revision surgery comparing to the initial failed surgery.

According to Robert et al. [5] we followed a surgical technique of removing the band and performing the LMGB operation at the same time, in order to prevent the increase in weight associated with the time between the removal of the band and the performing of the revision surgery, and to avoid the unnecessary exposure to the general anaesthesia. Despite our encouraging results, revisional surgery remains technically more difficult than a primary bariatric operation. The fundamentals of bariatric surgery and advanced laparoscopic surgery should be mastered, including two-handed technique and laparoscopic stapling and suturing (21).

Conclusions

The number of patients undergoing bariatric surgery is increasing due to the increase in the number of morbidly obese patients. Thus increasing the number of patients undergoing revisional bariatric surgeries.

There are still insufficient data to help surgeons in choosing the best revisional procedure. In our study we found that the conversion of failed LAGB to LMGB is considered to a safe and easy procedure to perform. Patient satisfaction was high, and recovery time was short. We also reported further significant weight loss and decreased comorbidities after the revision surgery.

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