

## Single Stage Revision of Laparoscopic Adjustable Gastric Band to Laparoscopic Single Anastomosis Gastric Bypass

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### Abstract

**Background:** Laparoscopic adjustable gastric band was one of the commonest bariatric surgery, but due to failure to maintain weight loss and incidence of complications more and more revisional surgeries are done nowadays, for patients with a previous gastric band. This study examined the outcome of one step revision from laparoscopic adjustable gastric band to laparoscopic single anastomosis gastric bypass.

**Methods:** Between 2015 and 2018 we had 38 cases at Ain Shams university hospitals, converted from LAGB to LSAGB. The cause of revision of the LAGB was mainly due to failure of weight loss, vomiting, abdominal pain, and reflux esophagitis. One year outcome of the procedure regarding, early and late complications, mortality, weight loss, and BMI changes were assessed.

**Results:** In this study, LASGB were performed as a revisional surgery after LAGB in 38 patients. The BMI was  $44.2 \text{ kg/m}^2 \pm 4.7$  before surgery, which dropped after surgery to  $38.6, 33.9, 31.5$  after 3, 6, and 12 months respectively. No mortalities were recorded in this study. The mean operative time was  $127.6 \pm 17.4$ , min and the mean length of stay in hospital was  $2.3 \pm 1.2$  days. Early complications were found in 7.89% formed of postoperative bleeding (2 patients) which was managed conservatively, and DVT (1 patient). Late complications occurred in 5.6% in the form of anastomotic ulcer (1 patient), managed medically and one case was converted to RYGB due to intractable biliary reflux.

**Conclusion:** Laparoscopic SAGB is a safe and effective revisional option for patients with failed LAGB, however, some cases may be technically challenging, also more studies with larger groups and longer follow up periods are needed.

**Keywords:** Laparoscopic adjustable gastric band; Revisional surgery; Laparoscopic single anastomosis gastric bypass

### Introduction

Laparoscopic adjustable banding was the most common bariatric procedure in Europe and North America. However, about half of these surgeries needed conversions due to failure to lose weight or complications like abdominal pain, vomiting and band migration [1,2]. It depended on the creation of a small gastric pouch causing early satiety and also decreasing the amount of food [3]. Various revisional surgeries have been used after failed laparoscopic gastric banding, in this study we offered one step revision from LAGB to laparoscopic single anastomosis gastric bypass.

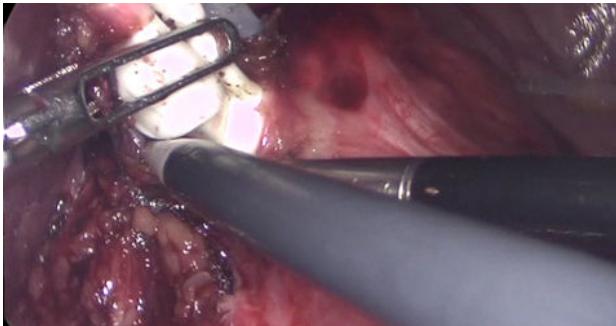
### Methods

Between 2015 and 2018 we had 38 cases converted from LAGB to LSAGB. The reasons for conversion of the LAGB differed from one patient to another, however, the most important reason was inadequate weight loss or weight regain in 80% of the patients. Other causes vomiting, abdominal pain, and reflux esophagitis attributed in the patient's decision. Some patients had more than one cause for band removal. This prospective study was conducted in Ain Shams

University hospitals after approval of ethical committee from January 2015 to January 2018, including 38 patients.

All patients had band removal and then LSAGB was done. During Preoperative workup, history was obtained, physical examination, Blood tests, Pelvic abdominal ultrasound, Chest X-ray, Echo, Pulmonary function test and Upper GI endoscopy were done. Patients with previous open operation in the stomach and patients with the migrated band into the stomach diagnosed by upper GI endoscopy were excluded from the study. Patient's age ranged from 23-56years with BMI from  $41 \text{ kg/m}^2$  to  $52 \text{ kg/m}^2$ . All patients were informed regarding surgical technique and likely complications. Informed consent was obtained from each patient. The patients were followed up after one week than 3, 6, 9, 12, months after surgery. Surgical technique: General anesthesia was used in all operations. Patients were positioned with legs apart in Anti Trendelenburg position. A prophylactic dose of Enoxaparin 40 was received on induction. Six trocars were used and placed as follows: Camera trocar (10 mm) 2 hand breadth below the xiphoid process, assistant instrument, (5 mm trocar) on the left anterior axillary line, a 12 mm trocar on the left midclavicular line between the first and the second trocars, a 12 mm trocar on the right midclavicular line.

Both for the surgeon, 5 mm trocar on right anterior axillary line and a 5 mm trocar placed below xiphisternum for liver retraction. Dissection of adhesions between the band and the liver was done then adhesions between the band and stomach were dissected and any found stitches are removed. The band was then removed, then SAGB was started by creating a window in the lesser omentum, stapling was then started using a green load 2 cm distal to crow's foot in a horizontal direction from the right 12 mm port (Figures 1 and 2).



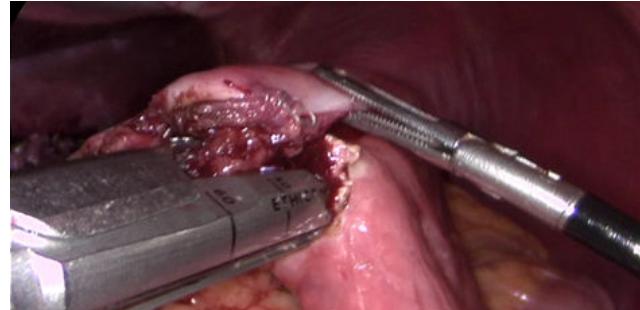
**Figure 1:** Band removal.



**Figure 2:** First transverse green load.



**Figure 3:** Creation of the gastric pouch.



**Figure 4:** Performing gastrojejunostomy.

Then a long gastric pouch was created on 40 fr bougie using blue loads from the left 12 mm port. 200 cm were counted from the ligament of Treitz, then end to side gastrojejunostomy was done, then the enterotomy was closed using continuous sutures (Figures 3 and 4).

A leak test was done using both methylene blue and air test. An 18 fr Nelaton drain was then placed before the closure of the muscles at the site of 12 mm ports, and then skin closure was done. Patients were kept on NPO for 24 h and on intravenous fluids, antibiotics, analgesics, proton pump inhibitor and anticoagulants in a prophylactic dose, oral intake was started on the first postoperative day after gastrograffin study. Patients were discharged in the second postoperative day after drain removal. Drugs prescribed for the patients were antibiotics, analgesics, proton pump inhibitor and anticoagulants in the form of enoxaparin 40 for one week. Patients were informed to come for follow up one week after the surgery then after 3, 6, 9 and 12 months. During this visits, weight was measured, and blood tests were done every 3 months.

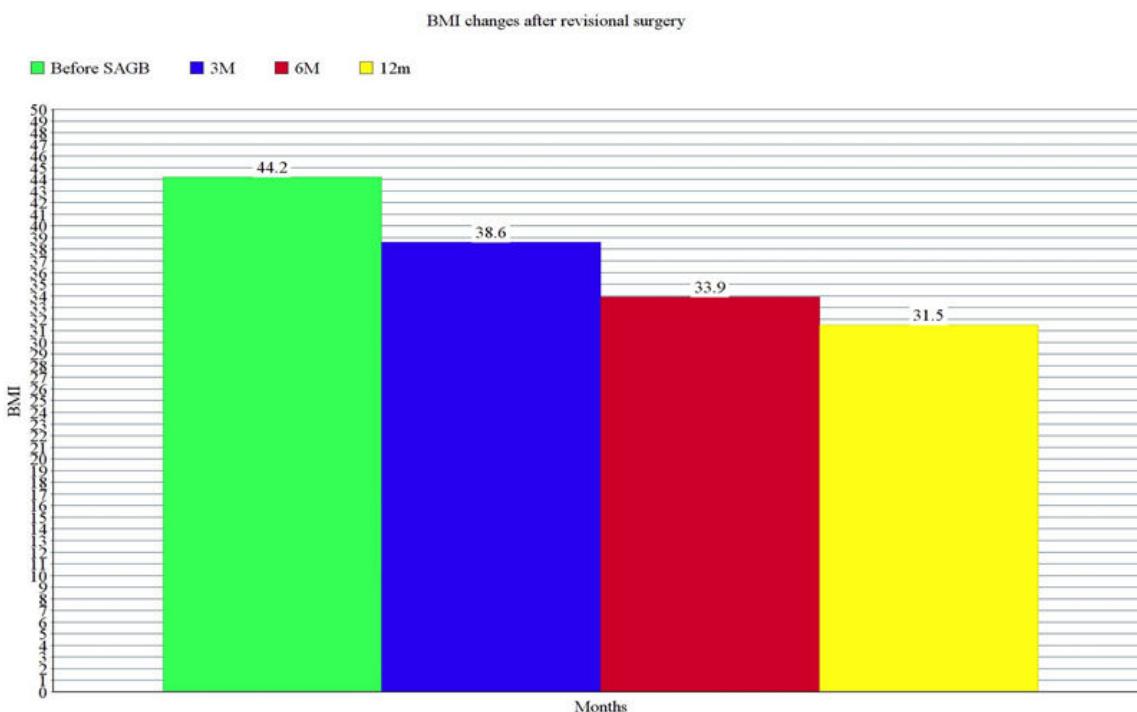
## Results

Between January 2015 and January 2018, 38 cases with previous LAGB operations were converted to LSAGB. The mean age was  $39 \pm 15$ , there were 27 females and 11 males, the mean preoperative weight was  $132 \pm 21$  kg. The preoperative BMI was  $44.2 \text{ kg/m}^2 \pm 4.7$  (Table 1).

Age	$39 \pm 15$
Females	27
Males	11
Preoperative BMI	$44.2 \text{ kg/m}^2 \pm 4.7$
Preoperative weight	$132 \pm 21$

**Table 1:** Patients preoperative data.

The mean operative time was  $127.6 \pm 17.4$  min, the mean hospital stay was  $2.3 \pm 1.2$ . Mean BMI dropped from  $44.2 \text{ kg/m}^2 \pm 4.7$  before surgery to 38.6, 33.9, 31.5 respectively after 3, 6, and 12 months (Figure 5).



**Figure 5:** BMI changes after surgery.

As for early postoperative complications, there were 3 patients, 2 patients had postoperative bleeding, one of them needed a blood transfusion and they were managed conservatively. The third patient had DVT 10 days after surgery, she was kept on anticoagulants for 6 months. As for late postoperative complications we had one patient with anastomotic ulcer due to smoking, the case was managed conservatively by the cessation of smoking and proton pump inhibitors. Another case with intractable biliary reflux which was converted to RYGB. There were no mortalities in this study.

## Discussion

Today, about 15% of bariatric procedures are revisional, and this number is liable to an increase in the coming years [4,5]. Revision procedures are often technically challenging for surgeons due to altered anatomy and firm adhesions following the primary procedure [6,7].

In a study done by Piazza et al. laparoscopic mini-gastric bypass was used as revisional surgery after failed LAGB in 48 patients, 82% of the patients were females, the mean age was 38 (range 20-59), the mean hospital stay was 3.25 days. There were no mortalities or morbidities within 60 days. BMI dropped from  $43.4 \pm 4.2$  preoperatively to  $34.1 \pm 3.77$  six months after surgery [8].

In a study done by Bruzzi et al. they compared the results of 22 patients, with previous LAGB who underwent conversion to single anastomosis gastric bypass ,to 96 patients who had LSAGB from the start, significant difference in percentage of excess BMI loss (EBMIL) was found at 12 months between primary and revisional SAGB ( $74 \pm 27$  versus  $61 \pm 15\%$  respectively), however there was no significant difference at 5 years, there were no anastomotic leaks or strictures, two

patients needed conversion to RYGB due to intractable biliary reflux [9].

Another study was done by Ghosh et al. where LSAGB were performed as a revisional surgery after LAGB in 74 patients. Patients were followed up for 12 months after surgery. The mean operative time was  $72.7 \pm 15.7$  min and the mean length of stay in hospital was  $2.6 \pm 1.2$  days. The BMI dropped from  $46.0 \pm 8.90$  preoperatively to  $41.6 \pm 7.66$ ,  $38.8 \pm 7.54$ ,  $35.4 \pm 7.10$  and  $33.2 \pm 7.34$  kg m<sup>2</sup>, at 6 weeks, then 3, 6 and 12 months respectively. Early complications were found in 20.3% formed mainly of anastomotic stricture or ulceration (8.1%), abdominal pain (5.4%), bowel obstruction (2.7%), and leak from the staple line (1%). Late complications that occurred after 30 days were mainly related to intractable bile reflux in 5.4%, and were managed by conversion to RYGB. There was no mortality in the study [10].

In this study, LSAGB were performed as a revisional surgery after LAGB in 38 patients. Follow up for the patients was 12 months after surgery. There was no mortality in the study. The mean operative time was  $127.6 \pm 17.4$ , min and the mean length of hospital stay was  $2.3 \pm 1.2$  days. The BMI dropped from 44.2 before surgery to 38.6, 33.9, 31.5 after 3, 6 and 12 months respectively. Early complications were found in 7.89% formed of postoperative bleeding (2 patients) which was managed conservatively and DVT (1 patient). Late complications occurred in 5.6% in the form of anastomotic ulcer (1 patient) which was managed conservatively and intractable bile reflux (1 patient) which was converted to RYGB.

## Conclusion

Laparoscopic SAGB is a safe and effective revisional option for patients with failed LAGB, however, some cases may be technically

challenging, also more studies with larger groups and longer follow up periods are needed.

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