

Laparoscopic one anastomosis gastric bypass as revisional surgery for failed laparoscopic gastric plication

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Introduction

Laparoscopic gastric plication (LGP) had been widely used in Egypt as being less expensive and safe bariatric surgery as compared with sleeve gastrectomy. However, it carries unsatisfactory long-term weight loss.

Aim

The aim of this study is to present and assess our technique and the results of laparoscopic one anastomosis gastric bypass (LOAGB) as revisional surgery for failed LGP.

Patients and methods

This study included 37 patients with failed LGP done at least 24 months earlier. LOAGB was used as revisional surgery for those patients. This prospective randomized study was conducted between January 2016 and February 2019. Patients were followed up for 18 months after revisional surgery.

Results

Mean BMI decreased from 45.1 ± 7 to 27.2 ± 2.3 kg/m². Mean percentage of excess weight loss was 72.9. The mean operative time was 168 ± 22 min. The mean hospital stay was 3 days. Complications occurred in the form of anastomotic leakage (one patient), intraoperative bleeding (two patients), postoperative hematemesis (one patient), and conversion to open procedure (one patient). There were no mortalities during this study.

Conclusion

LOAGB is a safe and effective revisional surgery for failed LGP.

Keywords:

laparoscopic gastric plication, laparoscopic one anastomosis gastric bypass, revisional bariatric surgery

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Introduction

Bariatric surgery is considered an effective therapy for the treatment of morbid obesity that ensures longstanding weight loss and control of the concurrent comorbidities [1]. There are three approaches for the implementation of bariatric surgery: restrictive, malabsorptive, or a combination of both.

Laparoscopic gastric plication (LGP) has been considered as a simple, less expensive, reversible, and low morbidity as compared with sleeve gastrectomy [2]. The procedure carries the restrictive concept of sleeve gastrectomy through inward folding of the fundus and greater curvature of the stomach [3].

Despite its assumed safety, the mid-term and long-term weight loss after gastric plication (GP) was not satisfactory, leading to frequent revisional surgeries. Sleeve gastrectomy is the most common revisional surgery after GP [4].

In our study, we analyzed our preliminary experience of laparoscopic one anastomosis gastric bypass (LOAGB) as revisional surgery for failed GP.

Patients and methods

This prospective randomized study was conducted at Ain Shams University hospitals between January 2016 and February 2019. Approval of the ethical committee was obtained before starting the study. All patients signed written consent after describing the procedure and the possible complications. A total of 37 patients with failed LGP underwent LOAGB and were assessed for 18 months following the operation. All the included patients fulfilled the following criteria: BMI 40 kg/m² with or without comorbidities, or BMI 35 kg/m² with comorbidities. All patients had follow-up visits with bariatric dietitians in our institute for at least 6 months; however, they failed to lose 50% of excess weight or there was progressive weight regain after LGP. At least 24 months separated the LGP from the revisional surgery. The patients underwent preoperative full laboratory tests,

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PAUS, ECG, Echo, respiratory function, and upper gastrointestinal endoscopy to assess the gastric lumen, mucosa, and the presence of hiatal hernia. Three-dimensional computed tomography virtual gastrography was done for all patients to assess the plicated stomach size.

Surgical technique

Prophylactic antibiotics and a prophylactic dose of Clexane 40 were given on induction. Surgery was performed under general anesthesia while patients were on the anti-Trendelenburgh position. Using five ports (two working 12-mm ports, one 10-mm port for the camera, and two 5-mm ports, one of them for liver retraction, and the other for the assistant), adhesions were dissected from the plicated stomach till reaching the left crus of the diaphragm using vessel sealing device.

Undo of the plication was performed meticulously, after which stomach transaction was started horizontally distal to the incisura using a green cartridge. A 40-Fr bougie was then passed by anesthetist then a long gastric pouch was created starting with green cartridges and ending with a blue one. Separation of the remnant stomach is done. Using a blue cartridge, gastrojejunostomy (4 cm in width) 200 cm from the duodenojejunal flexure was performed. Closure of enterotomy was done in two layers using vicryl 2.0. Methylene blue test was done and then a drain was inserted before extraction of the resected stomach. Muscle closure for the ports sites was done.

Early postoperative ambulation is encouraged. Patients were kept on analgesics, antibiotics, anticoagulants,

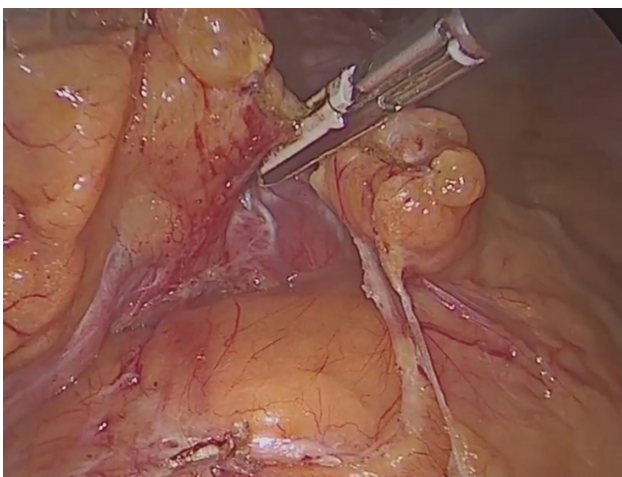
proton pump inhibitors, intravenous fluid, and nil per os until performing dye study after 24 h, after which clear fluids drinking was started. Analgesics, antibiotics, proton pump inhibitors (for 3 months), and anticoagulant (Clexane 40 for 10 days) were prescribed for the patients on discharge. On the first visit after 1 week, iron supplements, vitamin B, calcium, and multivitamins were prescribed for all patients. The patients were followed up at 1 week, 6 months, 12 months, and 18 months. Assessments of operative time, BMI, weight, perioperative complications, hospital stay, and comorbidities were done.

Results

This study included 28 females and nine males, with a mean age of 37 ± 8.2 years. At least 24 months separated LGP from the revisional OAGB (24–55), with a mean of 38 ± 7 months. The mean BMI decreased from $45.1 \pm 7 \text{ kg/m}^2$ at time of revisional surgery to $34.8 \pm 3.2 \text{ kg/m}^2$ 6 months after surgery then to $29.6 \pm 2.7 \text{ kg/m}^2$ 12 months after surgery then to $27.2 \pm 2.3 \text{ kg/m}^2$ 18 months after surgery. Mean percentage of excess weight loss (EWL%) was 45.3, 67.7, and 72.9 at 6, 12, and 18 months after surgery, respectively. The mean operative time of OAGB was 168 ± 22 min (Figs 1–4).

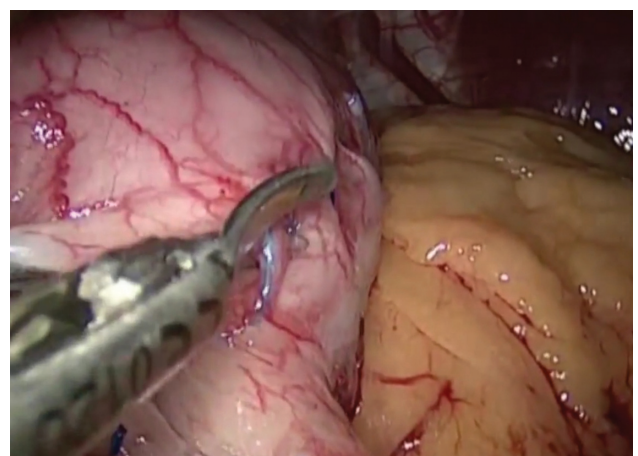
As for complications, one patient had an anastomotic leak that was presented clinically with tachycardia, fever, and surgical abdomen. Pelvi-abdomen ultrasound was done. It showed mild perigastric and perisplenic collections and was confirmed by gastrograffin contrast study. The dye study done on the first postoperative day. The patient was explored, and the leakage site was the gastrojejunal anastomosis.

Figure 1



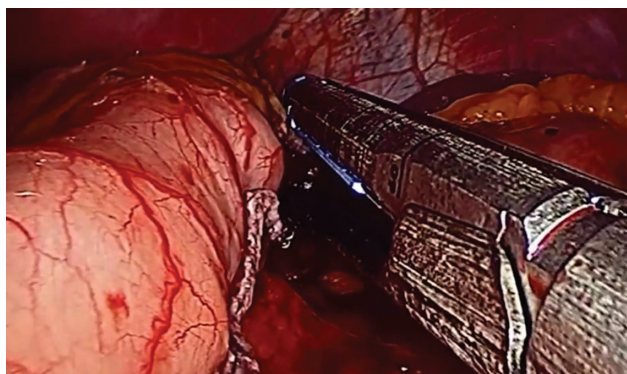
Dissection of adhesions.

Figure 2



Undo the plication.

Figure 3



Creating long pouch.

It was sutured with good drainage, and the patient recovery was uneventful. One patient had a leak from the pouch during performing intraoperative methylene blue test. Sewing of the leak in double layers was done, and the test was repeated twice using methylene blue and air. Two patients had intraoperative bleeding (160 and 290 ml), which was controlled using compression and clipping of the bleeding vessels.

One patient had hematemesis on the first postoperative day, which was managed conservatively. One case was converted to open surgery owing to dense adhesions. There were no mortalities in this study. The mean hospital stay was 3 days. As for comorbidities, 10 (27%) patients had type 2 diabetes mellitus, and after OAGB, three (30%) achieved complete resolution while medications were decreased in the other 7.

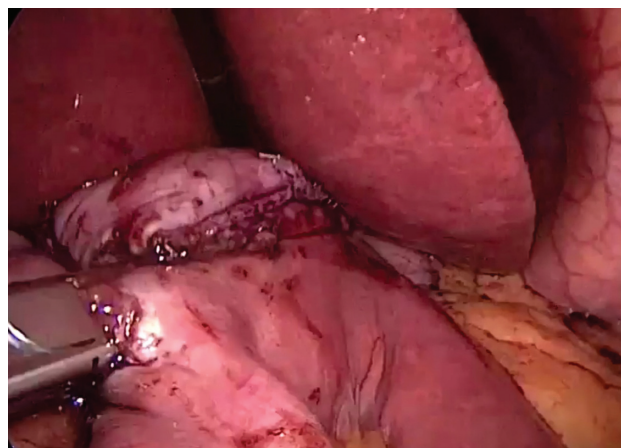
A total of six (16.2%) patients had hypertension, where two (33%) of them were resolved completely, whereas medications were decreased in the other 4. Dyslipidemias were diagnosed in eight (21.6%) patients, where three (37.5%) of them resolved completely after the OAGB, one patient improved, whereas no changes were detected in four patients (Table 1).

Discussion

Laparoscopic greater curve plication is a new weight loss procedure that has gained some popularity over many years [5]. GP is considered a restrictive procedure as it reduces the gastric capacity by inward folding of the greater curve and the fundus of the stomach and so forming a tube-like gastric pouch without transaction or use of staplers and cartridges.

The number of GP procedures that are performed annually is not known; however, the related

Figure 4



Performing gastrojejunostomy.

Table 1 Preoperative data compared with 18-month postoperative data

	Pre-OAGB	18 months after OAGB
Mean BMI	45.1±7	27.2±2.3
Mean EWL%		72.9
DM	10	3 resolved and 7 improved
Hypertension	6	2 resolved and 4 improved
Dyslipidemia	8	3 resolved and 1improved

DM, diabetes mellitus; EWL%, percentage of excess weight loss; OAGB, one anastomosis gastric bypass.

literature is increasing [6]. LGP is considered a simple procedure, inexpensive, effective, and reversible procedure and carries low morbidity when compared with other weight-loss surgeries [3–5]. However, the American Society for Metabolic and Bariatric Surgery (ASMBS) had stated that GP procedures should be considered investigational and performed through a study protocol [7].

The revisional bariatric procedure is usually indicated when there is a failure to lose weight or marked weight regain after previous weight loss or postoperative symptoms that affect the quality of life or in cases of marked malnutrition.

In 2012, Talebpour *et al.* [8] had reported a cohort of 800 patients who underwent GP, with EWL% at 55% after a 5-year follow-up. However, a 12-year follow-up had shown 31% of patients experienced weight regain. They had reported that for such patients revisional surgeries included 11 repeated gastric plication (re-GP), two Roux-en-Y gastric bypass (RYGB), and five different malabsorptive procedures. The re-GP produced 44 EWL% at after 6 months and 51% after 1 year.

Recently, Heidari *et al.* [9] had reported poor long-term weight loss in re-GP patients as compared with

those who had OAGB or a malabsorptive procedure after GP failure. So, we did not consider re-GP as a revisional option.

Zerrweck *et al.* [10] were the first to report a series of patients with failed GP converted to either sleeve gastrectomy for 17 patients and RYGB for 13 patients. The SG group had shorter operative times. However, at 18-month follow-up, the RYGB group had lower BMI (24.1 as compared with 25.8 kg/m² for SG; $P=0.006$) and higher EWL% (75.7 as compared with 61.4% for the SG; $P=0.008$). In our study, the mean EWL% was 45.3, 67.7, and 72.9 at 6, 12, and 18 months after surgery, respectively. The mean BMI decreased from 45.1 ± 7 kg/m² at time of revisional surgery to 34.8 ± 3.2 kg/m² 6 months after surgery then to 29.6 ± 2.7 kg/m² 12 months after surgery then to 27.2 ± 2.3 kg/m² 18 months after surgery.

LOAGB as a primary weight loss is reported to have a 6-month EWL% of 38–58%. The percentage reaches 64–80% at 24-month, and 70% at 36-month, and 73% at 60-month follow-ups [11].

Bruzzi *et al.* [12] compared the percentage of excess BMI loss between primary LOAGB and revisional LOAGB following failed restrictive procedure. Although percentage of excess BMI loss was lower in the revisional LOAGB, the difference was not significant in the long term.

Our results had shown that LOAGB is a very effective revisional surgery after failed GP. However, we suggest future randomized clinical trial studies with different revisional surgery methods following failed GP with a

greater number of patients. This will provide a higher level of evidence.

Conclusion

LOAGB is a safe and effective revisional surgery for failed LGP.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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