

*Research Article***Outcomes of Laparoscopic Mini Gastric Bypass as a surgical treatment for Morbid Obesity, a prospective Cohort study****Alaa M. Sewafy**

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Abstract

Background: Obesity is a common problem that may be associated with many comorbidities. The 1st line for treatment of obesity may be dieting and physical exercise, but it is difficult and of short term result. The most effective treatment for obesity is bariatric surgery, which includes a variety of procedures. Surgery for severe obesity is associated with long-term weight loss and decreased overall mortality. The aim of this study was to evaluate the effect of mini gastric bypass surgery as a treatment of morbid obesity and its role in co-morbidities resolution. **Patients and methods:** This study was a prospective cohort study conducted on 50 patients admitted to department of surgery in Minia University Hospital in the period from February 2014 to February 2016 and all patients were subjected to laparoscopic mini gastric bypass. **Results:** From total 50 patients, 20 were males (40%) and 30 were females (60%). The mean was age 33.7 ± 8.2 , the mean BMI was 49.0 ± 7.4 , the mean of excess weight loss (EWL) was $77.4 \pm 10.1\%$. Diabetes was present in 40% of our patients and after 12 months decreased to 2%. Hypertension was present in 50% and decreased to 4% by 12 months follow-up. Hyperlipidemia was present in 50% and after 12 months it dropped to 4%. Malnutrition occurred in 10%, reflux esophagitis occurred in 2%. **Conclusion:** Mini gastric bypass is effective method for treating morbidly obese patients with excellent control of associated comorbidities.

Keywords: Obesity, Gastric Bypass, Laparoscopic**Introduction**

Since Rutledge published his experience with mini-gastric bypasses^[1] many surgeons published extensive experience with this technique either as a primary or revisional settings^[1].

In spite the popularity of this technique it has critics, for example symptomatic biliary reflux has been reported and requiring revisional surgery^[1] in this study we aimed to evaluate this procedure as the most commonly used procedure in our institution were sleeve gastrectomy and roux en y gastric bypass.

Patient and method

This is a prospective cohort study, which carried out in laparoscopy surgery unit of Minia University hospital during the period from February 2014 to February 2016. Patients with BMI > 40 kg/m² or 30 kg/m² with comorbidity, psychologically stable,

agree to share in the study and with no history of any bariatric procedure were included in the study, while patients with: BMI < 30 kg/m², Binge eating disorders, untreated major depression or psychosis, current drug and alcohol abuse, Severe cardiac disease, Severe coagulopathy, Inability to comply with nutritional requirements including life-long vitamin replacement, endocrinal disturbance such as Cushing syndrome, hypothyroidism,...etc, revisional surgery and patients refused to share in the study were excluded from the study. The study received approval from our institution ethical committee and all patients gave written informed consent to share in the study. All cases were operated by laparoscopic mini gastric bypass in the 1st 8 months of the study and all cases followed up for at least 12 months. Each patient was evaluated by a multidisciplinary team (Nutritionist, Endocrinologist, Psychologist,

and Surgeon) using a standardized protocol. Routine preoperative investigations as for any bariatric procedure were done

Technique of Mini-Gastric Bypass:

Position and port sites:

The patient was put in French position with the main surgeon stood between the patient's legs. Five ports were placed: 12-mm camera port, 2 finger breadth to the left of the midline and one handbreadth below the xyphi-sternum, 12-mm port in at the right midclavicular line, 2-3 fingerbreadths below the costal margin, 12-mm port at the left midclavicular line, 2-3 fingerbreadths below the costal margin. 8-mm assistant port in the left anterior axillary line, 2-3 fingerbreadths below the left costal margin, another 8-mm port in the midline just below the xiphi sternum for liver retraction

Constructing of gastric tube and anastomosis:

The gastro-hepatic ligament is opened at crow's foot (the junction between the antrum and the body) on the lesser curvature, making a window into the lesser sac using harmonic scalpel (from Ethicon Endo-surgery-USA). Then from the left working port a 6-mm stapler (Echelon flex from Ethicon Endo-surgery-USA) was introduced (as there was no 8 mm stapler available) and fired perpendicular to the lesser curvature, to include only about 4 mm from the stomach. The first stapler firing is critical; it needs to be perpendicular to the lesser curvature and far down on the lesser curvature to create a long pouch, keeping the bile away from the esophagus. Then 42 French sized bougie was inserted and used to calibrate and reconstruct the gastric pouch. The next firings run parallel to the lesser curvature, the 6-mm stapler is repeatedly applied to reach the top of the stomach, during this steps sometimes there was some posterior gastric adhesion may be present and needed to be dissected before stapling. Then about 20 cm biliary limb is measured from the duodeno-jejunal junction to be anastomosed

to the gastric pouch using 6 mm stapler but also not the all length of the cartilage is used, but about half of it is introduced to create no so wide anastomosis.

Postoperative Period and Follow-Up:

Patients were encouraged to ambulate within 1-2 h of the operation. Oral clear liquids are started few hours after the operation. Patients are usually discharged in 1-2 days. The first follow-up was done on the seventh postoperative day then at 1, 3, 6, 12 months. The early and late complications, resolution of the comorbidities and weight loss were recorded. hemoglobin (Hb), glycosylated Hb, blood sugar, renal function tests, liver function tests, lipid profile, serum calcium, iron, vitamin D³, and vitamin B¹² were performed on follow-up visits. Multi-vitamin, iron, vitamin B¹² and calcium supplements were routinely prescribed for all patients. Upper GI endoscopy was done in patients with symptomatic reflux only.

Results

The Statistical software Program SPSS for Windows version 20 was used for data entry and analysis. Quantitative data were presented by mean and standard deviation, while qualitative data were presented by frequency distribution. Chi Square test was used to compare between two or more proportions. Paired-simple test was used to compare two means. The probability of less than 0.05 was used as a cut off point for all significant tests.

From total 80 patients, 20 were males (25%) and 60 were females (75%). The mean was age 33.7 ± 8.2 ranged from 21 to 48 years. As regard BMI: pre-operative BMI ranged from 29: 63 Kg/M² with mean of 49.5 ± 7.5 Kg/M². As shown in table (1) the BMI decreased gradually from 49.5 ± 7.5 to 32.7 ± 7.9 after one year. And in the form of EWL the mean of EWL was 44.5 ± 10.1% after one year. No cases failed to lose weight during the period of follow up

Table 1: Means of BMI pre and postoperative BMI

	BMI 0	BMI 1	BMI 3	BMI 6	BMI 12
N	50	50	50	50	50
Mean & SD	29.0±7.4	28.2 ± 6.8	27.1±7.1	26.1±7.0	22.7±7.9

P value 0.01 by paired simple test (significant)

The mean operative time was 100± 12 minute. Intraoperative bleeding occurred one case (2%) which can be controlled laparoscopically, no cases converted to open 0%. No cases developed leak 0%. Dumping: occurred in most of Cases and this is may not considered to be a complication as it induces the patient to eat a very healthy diet. All cases controlled by simple dietary modifications. All patients received dietary supplements immediately postoperative. 20 patients (40%) developed mild Iron deficiency anemia after 6 month,

we discovered that these patient did not regularly take the supplementations and this percentage dropped 2 month later into 10% by restrict instruction and follow up, to be sure that the patients regularly took the supplementations, then these cases of persistent malnutrition were controlled later by extra-supplements. two Cases (4%) developed symptomatic reflux esophagitis and all are controlled by prokinetic and PPI drugs.

Associated comorbidity resolution are shown in table 2

Table 2: Pre and postoperative status of obesity induced co-morbidities

	Preoperative	1 month post	3 month post.	6 month post.	12 month post
Diabetes	20 (40%)	0 (10%)	2 (4%)	1 (2%)	1 (2%)
HTN	20 (40%)	7 (14%)	0 (10%)	2 (4%)	2 (4%)
Elevated Serum lipid	20 (40%)	10 (20%)	4 (8%)	2 (4%)	2 (4%)

Discussion

Since Rutledge developed MGB, there were controversy about the technique and its outcomes. Supporters believe it is a simple and safe and could be alternative to Roux-en-Y gastric bypass (RYGB)^[7], as it has shorter operative time, better weight loss and lower complication rates, shorter hospital stay and shorter learning curve^[7-8]. Opponents of the procedure said that^[7,9] it lead to symptomatic gastritis and oesophagitis from biliary reflux which may require revisional surgery^[4]. In this study we aimed to evaluate this procedures in our institution

In our study the mean operative time was 120± 12 minute which is higher than the mean operative in other studies which around 73.0 minutes in meta-analysis involved 2,090 patients done by Kamal et al in 2013, this lengthy time can be explained by early experience with this technique.^[4]

Only one case (2%) in which intraoperative bleeding from the short gastric vessels and could be controlled laparoscopically with 0% conversion rate and 0% leak. this result is comparable to other study as regard early complications. In the other studies the

complication rates range from 0 to 10.0% with a conversion rate of 0.0-2.0% [4,10]

In this study the mean EWL was 44.8% ± 10.1% after one year and which is comparable with other studies. [4,11]

Our result revealed resolution of associated comorbidity in 98 & 96% for diabetes and hypertension consequently, this result is comparable to other studies. [4,11]

As regard the nutritional deficiency in this study, 10% of patients developed malnutrition, which is higher than the reported incidence in other studies, this may be due to small number of patients and non-compliance of the patients to regular intake of supplementations partially due to its cost and partially due to large size of available supplementations in our market which make it give gastric pain after swallowing especially early months postoperative [4,11]

2 patients (2%) developed symptomatic biliary reflux but controlled by medications, in study by Noun et al. [10] Four (4%) patients, presented with severe bile reflux not controlled by medication and needed conversion into Roux en Y anastomosis

Limitations of the study:

- 1- Small sample size
- 2- Not controlled
- 3- Short term follow up

Conclusion

Mini gastric bypass is effective method for treating morbidly obese patient with excellent control of associated comorbidities

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