Is single anastomosis gastric bypass with fixed common channel length is effective and safe as standard minigastric bypass?

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Background
Although minigastric bypass (MGB) leads to a safe and considerable weight loss in most patients, there is still weight regain or unsatisfied weight loss, which occurs in ∼13% of patients; moreover, 0.5% of the patients develop malnutrition, requiring surgical correction. The main cause behind is that the small intestinal length is very variable, and in standard MGB, the common channel length is not measured, and there is a strong evidence to support that the degree of malabsorption after gastric bypass surgery is influenced mainly by the length of common channel.

Aim
The aim was to study the effects of fixed common channel length on the outcome of MGB regarding the weight loss and the incidence of nutritional deficiencies.

Patients and methods
This prospective randomized study included 60 obese patients who underwent laparoscopic MGB surgery between March 2016 and March 2018. They were assigned into two groups: group I underwent standard MGB, and group II underwent single anastomosis gastric bypass with fixed common channel length of 300 cm.

Results
Both groups had satisfactory excess weight loss (EWL); however, EWL was steadier in group II. Mean percentage of EWL reported after 1 year was 67±6% in group I, whereas in group II was 70±1.47%, with *P* value of 0.453. There was less incidence of nutritional deficiencies in group II.
Both groups had significant improvement of preoperative comorbidities, for instance, 36.7% of group I and 50% of group II showed improvement of their diabetes status (P=0.297), and ∼33.3% of both groups I and II showed improvement of their blood pressure.
In addition, malodorous flatus affecting social life was more frequent in group II than in group I, with *P* value of 0.001; however, this did not affect their quality of life, estimated by bariatric analysis and reporting outcome system (BAROS).

Conclusion
Performing single anastomosis gastric bypass with fixed common channel length achieves satisfactory maintained EWL, with less possible metabolic complications.

Keywords:
fixed common channel, laparoscopic minigastric bypass, standard minigastric bypass

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Introduction

Morbid obesity is one of the most considerable health issues worldwide. Medical and surgical societies confirmed that surgery is the best treatment option in the management of obese patient, and it is currently the only long-term effective therapy for achieving weight loss, with significant improvement or resolution of comorbidities and increase in life expectancy [1].

In 1997, Rutledge introduced laparoscopic minigastric bypass (MGB) aiming to carry out an ideal weight loss operation, which would be effective, easy to perform, and safe. The procedure consists of a long lesser curvature gastric pouch with a side-to-side loop gastrojejunostomy performed 180–220 cm distal to the Treitz ligament [2].

The MGB was developed to overcome operative difficulties and risks of Roux-en-Y gastric bypass (RYGB). It is considered an appealing alternative to RYGB, with an easier technique and safer outcome in the short term and after 5 years of follow-up [3].

Noun *et al.* [4] revealed that MGB is an effective, relatively low-risk, and successful bariatric procedure. In addition, it can be easily revised, reversed, or sleeved when needed. In comparison with RYGB, MGB can be regarded as a simpler, safer, and easy-exit procedure.

MGB leads to a considerable weight loss in most patients [5]. It has been noticed that after 1 year of follow-up, the average percentage of the excess weight loss (EWL) reaches 60–80%, with reduction of preoperative comorbidities, but there is partial weight regain detected during the long-term follow-up [6]. However, with time following surgery, the weight was not stabilized, and constant weight regain, varying from 2 to 19.4% of the initial weight, occurred in ~13% of the patients [3].

As MGB works as a restrictive malabsorptive procedure, there is a debate about its malabsorptive effect. The ideal length of the gastric bypass limbs is debated. Recent evidence suggests that standard limb lengths used today have a limited effect on patient weight loss; nevertheless, there is evidence that mainly the length of common channel influences the degree of malabsorption after gastric bypass surgery [7,8]. Moreover, there are randomized controlled trials addressing the role of common channel in morbid obesity [9].

Hernández-Martínez and Calvo-Ros [10] performed LRYGBP with a fixed common channel length of 230 cm in 565 patients, and the rest of small intestine was redistributed among alimentary channel (60%) and a biliopancreatic channel (40%). The patients were followed up for more than 8-year period and revealed long-lasting sustained EWL of more than 75%, with few nutrient deficits and metabolic complications.

Recent studies support the notion that to achieve significant sustained long-lasting weight loss, bariatric surgeons should focus on the length of the common channel rather than the alimentary and biliopancreatic limbs when constructing a gastric bypass, especially in the super-obese population, where failure rates after conventional gastric bypass are higher [11].

In our study, we assessed the EWL and nutritional deficits after single anastomosis gastric bypass with fixed common channel length 300 cm proximal to the ileocecal junction in comparison with the standard MGB, to study the effects of fixed common channel length on the outcome of MGB regarding the weight loss and the incidence of nutritional deficiencies.

Aim

The aim was to study the effects of fixed common channel length on the outcome of MGB regarding the weight loss and the incidence of nutritional deficiencies.

Patients and methods

This prospective study included 74 morbid obese patients presented to obesity clinic at Ain Shams University who underwent MGB surgery between March 2016 and March 2018. A total of 14 patients were excluded: seven patients could not complete 1-year follow-up, four patients had previous bariatric operations, and three patients had contraindication to insufflations. Therefore, the study was performed on 60 patients.

Patients were randomly assigned to surgical procedures by card selection (odd and even numbers). After their approval to participate in the study (IRB approval ethical committee, Department of General Surgery, Ain Shams University), a written informed consent was obtained from all patients before being assigned to surgery. Patients were divided into two groups: group I (odd n=30) underwent standard MGB and group II (even n=30) underwent single anastomosis gastric bypass with fixed common channel length of 300 cm.

We included all patients with age more than 18 years and BMI more than 40 or 35 with one of the known comorbidities, including type II diabetes, hypertension, hyperlipidemia, and obstructive sleep apnea (OSA). Moreover, we excluded patients with endocrinological diseases such as hypothyroidism and Cushing syndrome; patients who had previous bariatric operations; patients with contraindications for insufflation, such as cardiovascular or respiratory diseases; those with psychological disturbances; or patients who refused to participate in the study. All the patients participated in our study completed 1 year of follow-up, and the patients who had not completed 1 year of follow-up were excluded from the study.

Patients were assessed preoperatively regarding their personal history, including their age, sex, residence, occupation, and history of smoking or alcohol intake, and menstrual history in females. In addition, they were assessed regarding their past history of any coexisting medical diseases like diabetes mellitus (DM), hypertension, osteoarthritis, OSA, polycystic ovary, ischaemic heart diseases (ISHD), drug intake, and previous operations.

Moreover, a detailed history was done of their present condition, eating habits, and previous diet control trials and effect of obesity on daily activities and lifestyle. Complete physical examination was done, with measurement of weight in kilogram, height in meter, and calculation of BMI=[weight (kg)/height (m^2)].

All patients were investigated through bariatric laboratory workup, which included complete blood picture, coagulation profile (prothrombin time, international normalized ratio, and partial thromboplastin time), renal functions (serum creatinine and blood urea nitrogen), liver functions (alanine transaminase, aspartate transaminase, total and direct bilirubin, total proteins, and serum albumin), full lipid profile (total cholesterol, high-density lipoprotein, low-density lipoprotein, and triglycerides), serum electrolytes (sodium, potassium, and calcium), random blood sugar (in diabetics we added fasting, 2-h postprandial blood sugar, and glycated hemoglobin), thyroid profile, and serum cortisol. Pelvi-abdominal ultrasound was done for associated gallstones and liver size (hepatomegaly) and upper GI endoscopy for associated hiatus hernia, gastritis, peptic and duodenal ulcers, gastro oesophageal reflux disease (GERD), and any gastric masses.

Other preoperative investigations included chest radiograph, ECG, echocardiogram, arterial blood gases (ABG), and pulmonary function tests.

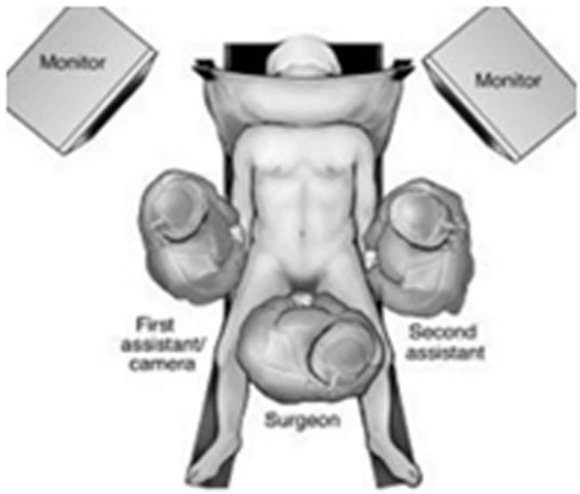
American Society of Anesthesiologists score was determined for all patients based on the classification of the American Society of Anesthesiologists.

Operative procedures

The patient was put in a supine decubitus position, with both upper limbs put on an arm rest. The table was then elevated and put in reverse Trendelenburg position, and then opening of the patient legs was done, putting them at leg rest, with fixation of the legs at this position by straps (French position). The patient was secured well to the operating table in order not to fall during changing of position. Sterilization and draping of the area between nipple line and upper thigh were done. The surgeon stood between the patient legs and the assistant to left of the patient, and the camera man to the right of the patient (Fig. 1).

Five ports were used to perform this procedure: the first port (Visiport 12 mm) was introduced through the middle point of the line between the xiphoid and umbilicus slightly to the left of midline, two 12-mm ports were on each side of the midline at mid clavicular line (MCL), and two 5-mm ports were introduced one at the xiphoid process for liver retractor and the other one at the left subcostal position for the assistant (Fig. 2).

Figure 1



Position of patient and arrangement of surgical team.

Figure 2

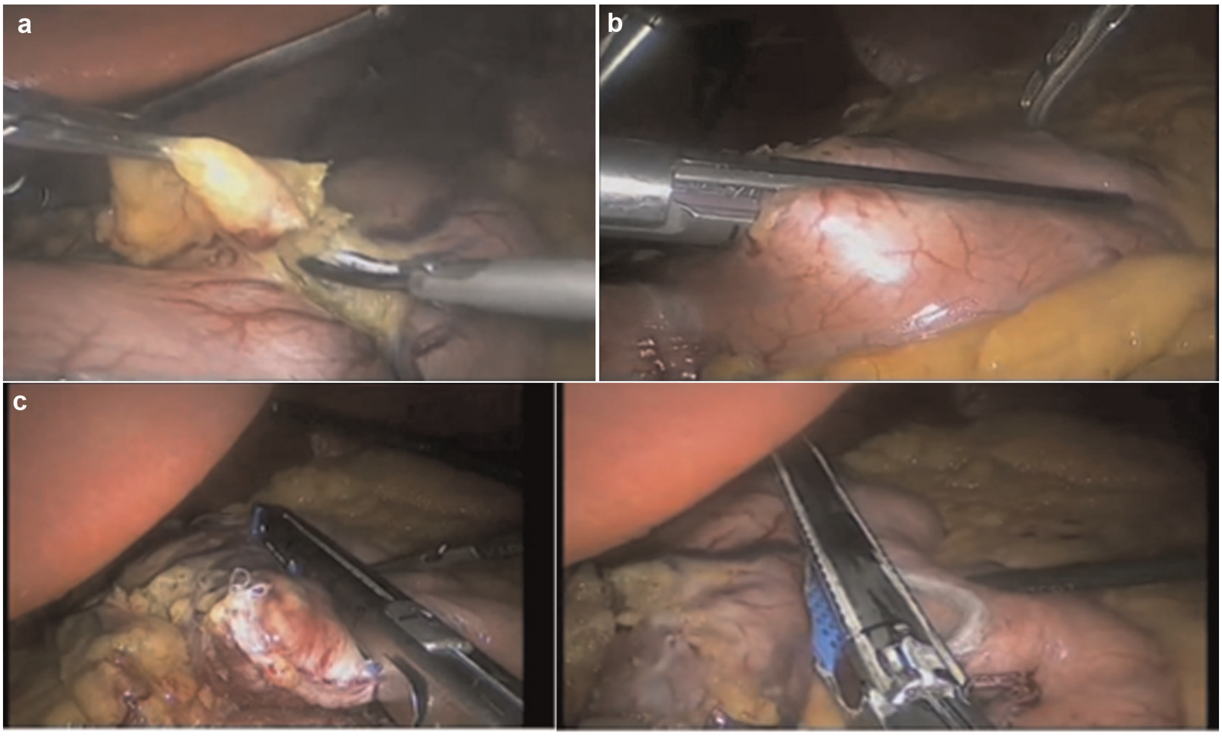
Ports’ position.

After achieving pneumoperitoneum, a point at the lesser curvature of the stomach was identified as crow’s foot level as close as possible to the gastric serosa and then started making a hole using the ligasure or harmonic device to gain access to the posterior wall of the stomach (Fig. 3a).

On reaching the lesser sac, a 45 mm cartridge length is fired using Endo-Gia stapler to transect the stomach horizontally then serial three to four 60 mm cartridges used to fashion the gastric pouch vertically till reaching the gastro-esophageal junction. 36 French Calibration tube is used along the lesser curvature of the stomach (Fig. 3b).

Overall, three or four 60 mm Endo-Gia cartilages were needed to complete the transaction of the stomach. An

Figure 3



(a) Creation of a window to enter the lesser sac. (b) First stapler passing horizontally to the stomach axis. (c) Staplers passing vertically to create the gastric pouch.

additional 30 or 45-mm cartilage was sometimes needed (Fig. 3c).

After creating a long slim gastric pouch, a hole in the horizontal part of the pouch was created for later anastomosis (Fig. 4a). Then gastrojejunostomy was formed 200 cm distal to Treitz ligament, with 60-mm blue Endo-GIA cartilage (Fig. 4b). The gastric and jejunal holes were closed by Vicryl 3/0 single layer anastomosis (Fig. 4c). For checking if the anastmosis was air and fluid tight or not, methylene blue test was done. Finally, tube drain was inserted near the anastomosis and then abdomen was deflated and port-sites were closed.

In group II, the same steps were done as in standard MGB procedure, but instead of creation of gastrojejunostomy 200 cm distal to ligament of Treitz, we identified the ileocecal junction, and then the gastrojejunostomy was created 300 cm proximal to the ileocecal valve (Figs 5 and 6).

Measuring the entire length of the small bowel was done routinely in group I MGB to avoid short bowel syndrome in patients with formerly short small bowel length, whereas in group II, this is not mandatory, as we start measuring from the ileocecal junction, creating sufficient common channel length.

In both groups, Endo-GIA staplers and cartridges used were either Covidien (Medtronic) or Ethicon surgical staplers.

Postoperative management

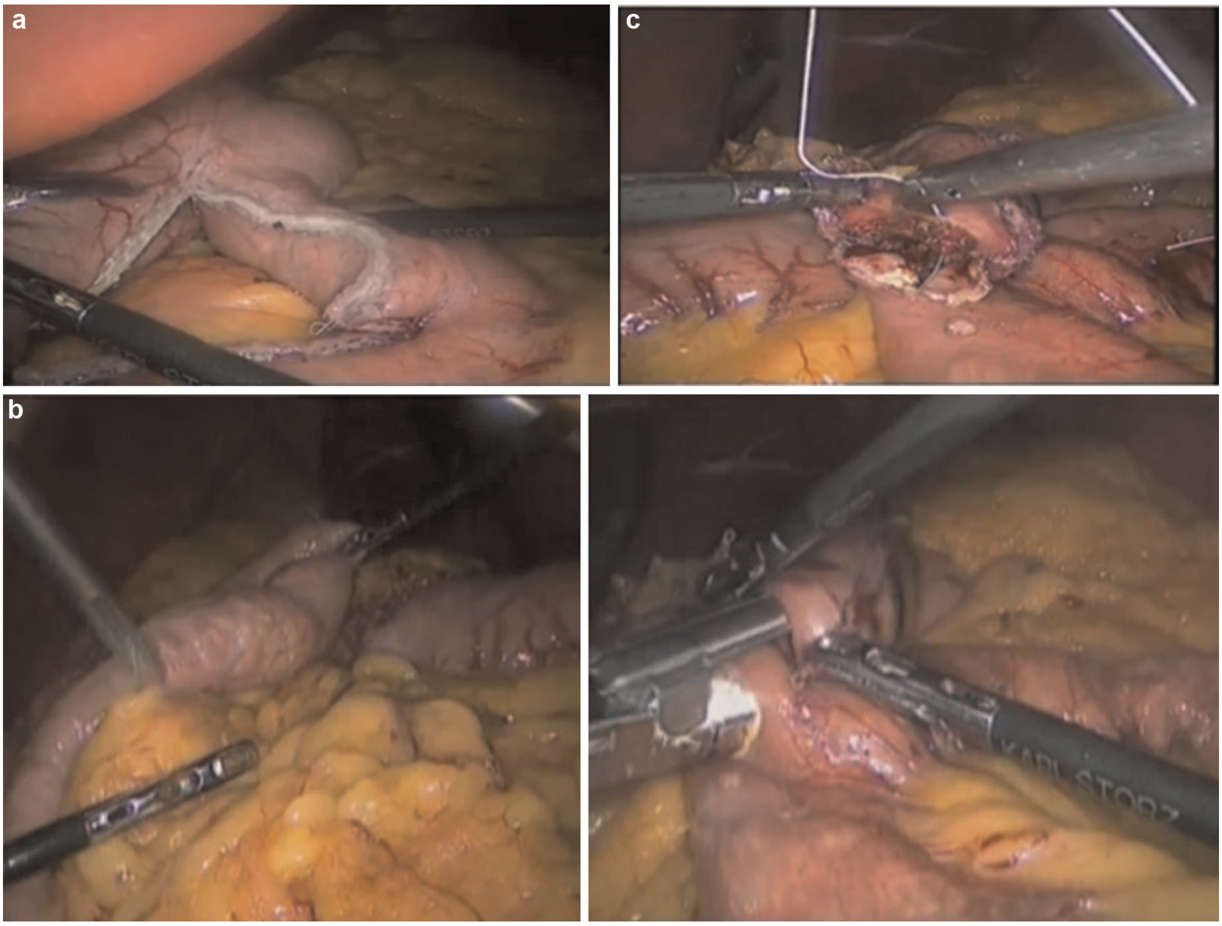
The patients were permitted to start oral clear fluids and continued on oral fluids for 10 days, then soft diet followed by semisolids for another 10 days, and then, small frequent meals in proportion to the patient habit.

When oral intake started, oral proton pump inhibitors (PPI) was given for 3 months routinely and up 12 months according to symptoms.

All patients included in our study were given oral supplements of calcium, vitamin D, and iron, and vitamin B12 injection for 3–6 months.

Follow-up visits were done 1 week after discharge, with the patient's wounds inspected, with follow-up of the diet intake, weight, and height measurement, and then other visits were scheduled at 3, 6, 9, and 12 months postoperatively at our outpatient clinic, where the percentage of EWL was calculated for every patient, and serial follow-up measurements to check any vitamin and mineral deficiency (vitamin B, serum iron, and serum calcium).

Figure 4



(a) The long gastric pouch created. (b) Antecolic terminolateral gastrojejunostomy between the gastric pouch and jejunal loop 200 cm from Treitz's ligament. (c) Closure of the residual orifice by Vicryl sutures.

Moreover, follow-up of patient regarding preoperative comorbidities such as DM, hypertension, hyperlipidemia, ischaemic heart diseases (ISHD), osteoarthritis, and OSA and assessment of its postoperative state was done at the previously mentioned visits, in addition to examination for port site hernia.

Moorehead-Ardelt Quality of Life Questionnaire along with a survey of current weight and comorbidity information (BAROS) [23–25] was mailed to each patient with a cover letter explaining the voluntary nature of the study after 12 month from the surgery.

The bariatric analysis and reporting outcome system (BAROS) consists of a scoring table that includes three columns with the main areas of analysis: weight loss, improvement of medical conditions, and quality of life.

Points are added or subtracted according to changes in these domains. A maximum of three points is given to each domain to evaluate changes after medical or surgical intervention. Points are deducted for complications or reoperations.

Assessment of changes in patient's bowel habit and flatulence problems (flatulence flatus odor) and its effects on social life was done through Flatus Severity score, which is dependent on a specific self-administered questionnaire.

Data management and analysis

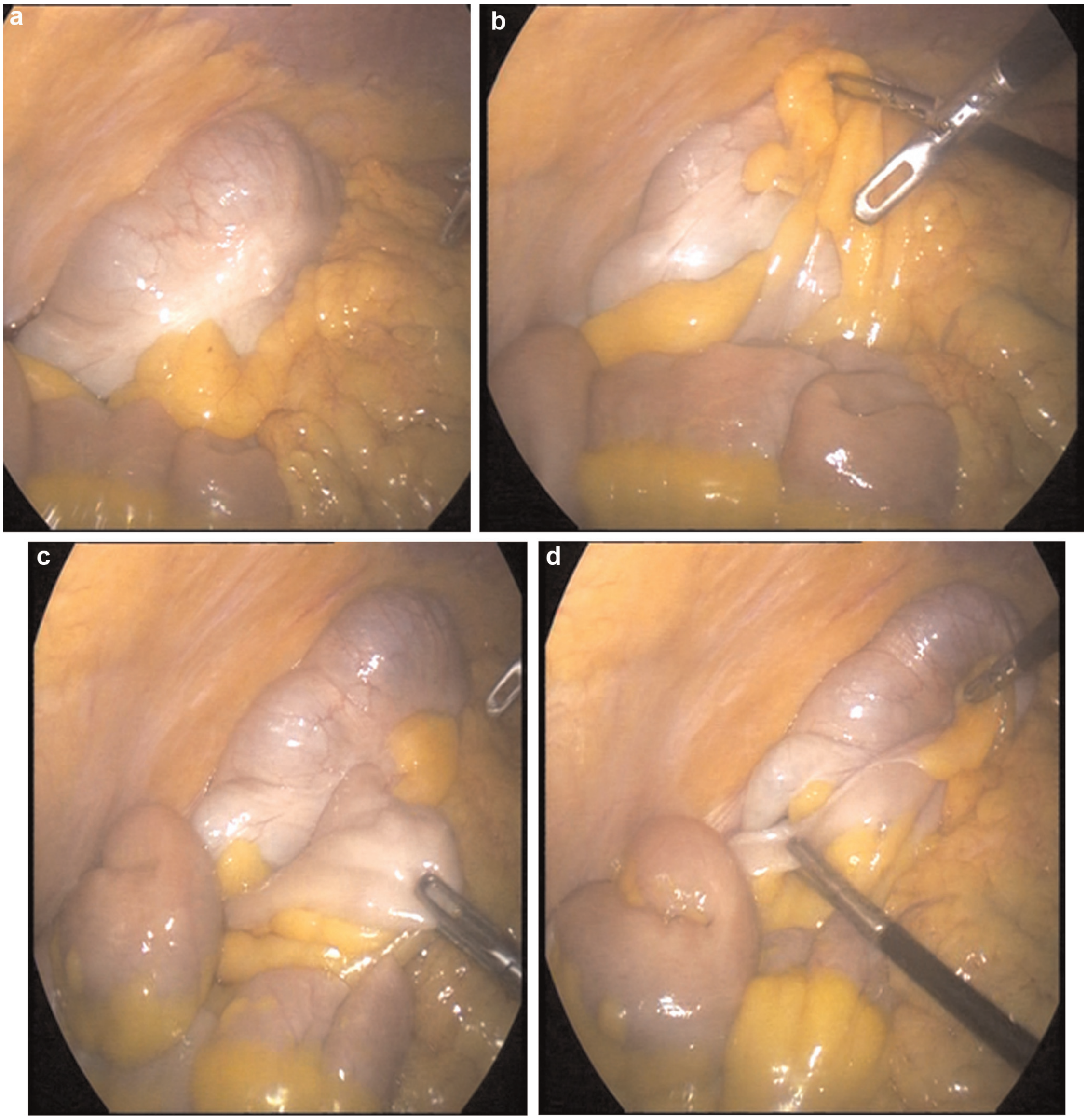
The collected data were revised, coded, tabulated, and introduced to a PC using Statistical package for Social Science (IBM Corp. Released 2011, IBM SPSS Statistics for Windows, Version 20.0.; IBM Corp., Armonk, New York, USA).

Data were presented, and suitable analysis was done according to the type of data obtained for each parameter.

Descriptive statistics

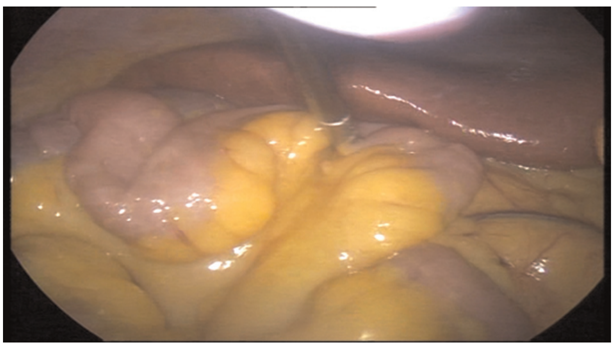
(1) Mean, SD, and range were used for parametric numerical data,

Figure 5



(a, b) Identification of cecum and ileocecal junction, (c, d) measuring the common channel from terminal ileum.

Figure 6



Loop of ileum brought up to the gastric pouch for anastomosis.

(2) Frequency and percentage were sued of non-numerical data.

Analytical statistics

(1) Student *t* test was used to assess the statistical significance of the difference between two study groups' means.
(2) χ^2 test was used to examine the relationship between two qualitative variables.
(3) Fisher's exact test was used to examine the relationship between two qualitative variables when the expected count is less than 5 in more than 20% of cells
    (a) *P* value was considered significant when *P* value less than 0.05.

A total of 60 patients, comprising 23 (38%) males and 37 (62%) females, underwent MGB surgery between March 2016 and March 2018 then followed up for 1 year.

Patients of group I had a mean age of 44.97 years, ranging from 27 to 67 years, whereas those of group II had a mean age of 45.10 years, ranging from 28 to 66, with no statistically significant difference between the two groups (Table 1).

Regarding the baseline preoperative comorbidities and postoperative improvement of comorbidities, there were no statistically significant differences between the two groups. However, both groups showed significant improvement in their comorbidities, for instance, 36.7% of group I and 50% of group II showed improvement of their diabetes status (improvement in glycated hemoglobin), and ~33.3% of both group I and group II showed improvement of their blood pressure (Table 2).

Improvements of osteoarthritis an OSA were determined through assessment of the patients' symptoms during follow-up visits in comparison with their initial preoperative symptoms.

Generally, there were no significant difference among the two groups regarding intraoperative complications; however, mean operative time in group II significantly exceeds that in group I, as we have to change the patient position intraoperatively to measure the common channel from the ileocecal junction (Table 3).

One case of intraoperative leakage in group II was observed through the methylene blue test, because of iatrogenic intestinal injury; it was managed successfully through laparoscopic suturing the detected injury.

Table 1 Preoperative data of patients

	Group I Mean (SD)	Group II Mean (SD)	*P* value
Age	44.97 (10.94)	45.10 (10.68)	0.962[a]
Sex	*n* (%)	*n* (%)	
Male	11 (36.7)	12 (40.0)	0.791[b]
Female	19 (63.3)	18 (60.0)	
Preoperative comorbidities			
DM	16 (53.3)	17 (56.7)	0.795[b]
HTN	14 (46.7)	12 (40.0)	0.602[b]
Hyperlipidemia	12 (40.0)	13 (43.3)	0.793[b]
Osteoarthritis	10 (33.3)	12 (40.0)	0.592[b]
Obstructive sleep apnea	8 (26.7)	10 (33.3)	0.573[b]
BMI	Mean (SD)	Mean (SD)	
Weight	126.00 (13.01)	126.57 (12.98)	0.866[a]
Height	1.72 (0.06)	1.72 (0.06)	1.0[a]
BMI	42.62 (4.47)	42.59 (4.47)	1.0[a]

DM, diabetes mellitus; HTN, hypertension. [a]Student *t* test. [b]χ^2 test.

Table 2 Postoperative improvement of comorbidities

	Group I [*n* (%)]	Group II [*n* (%)]	*P* value
Improvement of DM	11 (36.7)	15 (50.0)	0.297[a]
Improvement of HTN	10 (33.3)	10 (33.3)	1.0[a]
Hyperlipidemia	9 (30.0)	12 (40.0)	0.417[a]
Osteoarthritis	6 (20.0)	10 (33.3)	0.243[a]
Obstructive sleep apnea	6 (20.0)	9 (30.0)	0.371[a]

DM, diabetes mellitus; HTN, hypertension. [a]χ^2 test.

Table 3 Intraoperative complications

Intraoperative complications	Group I [*n* (%)]	Group II [*n* (%)]	*P* value
Intraoperative leaks	0	1 (3.3)	1.0[a]
Intraoperative bleeding	0	0	1.0[a]
Intestinal injuries	0	1 (3.3)	1.0[a]
Conversion to open procedure	0	0	
	Mean (SD)	Mean (SD)	*P* value
Operative time	127.93 (29.55)	144.77 (22.70)	0.016[b]

[a]Fisher exact test. [b]Student *t* test.

There was neither intraoperative bleeding nor conversion to open in both groups.

Weight loss, which is expressed in percentage of the EWL, is reported in Table 4. The percentage of EWL was measured at each follow-up visit after 3, 6, 9, and 12 months, and no significant difference between the two groups was reported; however, we noticed that percentage of EWL in group I has a wide range of EWL after 12 months (range, 65–72) in comparison with that in group II (range, 69–75).

Sometimes, the values of EWL in group I became less than expected, which may be owing to poor patient compliance to dietary control or owing to relatively long common channel. On the contrary, EWL in group I could be higher than expected values, which may be the result of shorter common channel, which was experienced in one of the patients of group I.

As a result, this could emphasize the significance of measuring the length of common channel to maintain the EWL within the average expected values.

Moreover, concerning the follow-up of nutritional deficiencies (vitamins and minerals) postoperatively, no statistically significant differences was reported between the two groups. However, one of the patients in group I presented with severe nutritional deficiencies during her follow-up visits at 3, 6, and 9 months, despite nutritional supplements, which necessitated re-exploration to assess her intestinal length. It was discovered that she had a short common channel length (200 cm from ileocecal junction), although her anastomosis was done in a proper way at 200 cm distal to DJ junction. She required revision to a gastroplasty, and then the patient started to regain weight at her follow-up visit (Table 5).

Regarding BAROS and Moorehead-Ardelt Quality of Life Questionnaire score, there was no statistically significant difference between the two groups, where the mean score for group I was 6.73, which is classified as a very good outcome, whereas the mean score for group II was 7.2, which is an excellent outcome (Table 6).

Fecal consistency changed significantly after surgery, such that we reported loose stools and diarrhea after both procedures, but more reported in group II.

In addition, malodorous flatus affecting social life was more frequent in group II than in group I. Furthermore, flatus frequency increased in both groups, but group II patients were more bothered by their malodorous flatus than those of group I (Table 6). The mean flatus severity score was significantly higher in group II patients (*P* value 0.001). In consequence, this raise a question, although Flatulence severity score correlated inversely with the quality of life estimated by

Table 4 Follow-up of percentage of excess weight loss

Percent of excess weight loss	Group I [mean (SD)]	Group II [mean (SD)]	*P* value
Follow-up (months)			
>3	37.47 (2.89)	38.67 (0.84)	0.79[a]
>6	53.07 (2.78)	55.03 (1.67)	0.53[a]
>9	66.03 (2.86)	67.50 (1.03)	0.78[a]
>12	67.13 (6.36)	70.10 (1.47)	0.453[a]

[a]Fisher exact test.

Table 5 Follow-up of nutritional deficit

Serum calcium, iron, vitamin B1, and vitamin B12 deficiency (months)	Group I [*N* (%)]	Group II [*N* (%)]	*P* value
>3	1 (3.3)	0	1.0[a]
>6	1 (3.3)	0	1.0[a]
>9	1 (3.3)	0	1.0[a]
>12	1 (3.3)	0	1.0[a]

[a]Fisher exact test.

Table 6 BAROS and Moorehead-Ardelt Quality of Life Questionnaire score and Flatus Severity score

	Group I [mean (range)]	Group II [mean (range)]	*P* value
BAROS and Moorehead-Ardelt Quality of Life Questionnaire score	6.73 (3–7)	7.2 (4–7)	0.85
	Mean (SD)	Mean (SD)	
Flatus Severity score	21.93 (1.20)	28.00 (1.05)	0.001

BAROS, bariatric analysis and reporting outcome system.

BAROS; however, the total outcome of quality of life in Group II was excellent in comparison to that of Group I, which was very good. This reflects the greater impact of significant weight loss & improvement of preoperative comorbidities on the quality of life.

Discussion

A successful bariatric surgical procedure for morbid obesity patients aims to achieve long-lasting adequate EWL with minimal adverse metabolic effects. Over the past several decades, various techniques have been developed to obtain a balance between caloric restriction and malabsorptive procedures [10,12–16].

MGBP is considered one of the popular bariatric procedures because it is a restrictive and malabsorptive mechanism, with a safe, simple procedure and long-lasting weight loss and low nutritional complications [10].

To achieve a proper malabsorption, common channel length should be considered. Scopinaro *et al.* [14] concluded that long common limb will produce lesser metabolic complications than the shorter common limb. On the contrary, Leifsson and Gislason [17] as well as Hernández-Martínez and Calvo-Ros [10] left a variable common limb of 250–400 cm in length; they found lesser nutritional comorbidities as reported in our present study.

Hernández-Martínez and Calvo-Ros [10] performed LRYGB with a fixed common channel length of 230 cm in a series of 565 patients, and promising results were reported to achieve long-lasting EWL around 70% over 8-year follow-up, with few metabolic complications. However, in Scopinaro's biliopancreatic diversion that performed a common channel of 50 cm, although this approach seems to be superior to RYGB for long-term weight loss in super-obese patients [14,18,19], high rates of metabolic complications were reported [12,14,20]. Accordingly, this could emphasize the rationale behind measuring the entire small bowel length and performing the anastomosis at fixed length from the ileocecal junction in order to achieve satisfactory maintained EWL with least possible metabolic complications.

In the study by Rutledge and Walsh [5] that was performed on ~2400 patients who underwent MGB procedure and followed up for ~38 months, preoperative comorbidities were reported such as degenerative joint disease (68%), hypertension (54%), hypercholesterolemia (66%), OSA (29%), and DM (24%). On the contrary, in our study, the results of our experience with a series of 60 patients where 30 patients underwent standard MGB (group I) and 30 patients underwent single anastomosis gastric bypass with fixed length common channel (group II), the patients had preoperative comorbidities as well; however, there were no statistically significance between the two groups.

In the study by Rutledge and Walsh [5], mean operative time was 37.5 min, the conversion rate to open MGB was 0.17%, and the mean preoperative BMI was 46±7 kg/m^2. In respect to our study, mean operative time for group I was 127.9±29 min, whereas that for group II was 144.7±22 min. Regarding the mean preoperative BMI in our study, it was relatively the same between the two groups (42.6±4 kg/m^2).

The relative longer operative time in our study might be related to some technical and instrumental unreadiness, especially in group II, as we also need to change the patient position to measure the common channel limb from ileocecal junction.

Moreover, our reported operative time was relatively close to Chakhtoura *et al.* [21], where the mean operative time was 129±37 min.

In relation to mean percentage of EWL reported after 1 year in Rutledge study, which was 80%, excessive weight loss with malnutrition occurred in 31 (1%) patients and required revision to a gastroplasty (division of the gastrojejunostomy, and gastrogastrostomy). In our study, mean percentage of EWL reported after 1 year was 67±6% in group I, whereas in group II was 70±1.47%.

We have noticed that sometimes EWL in group I became less than expected values, which may be owing to poor patient compliance to dietary control or due to relatively long common channel or could be higher than expected values, which may be a result of shorter common channel, as experienced in one of the patients of group I, in whom we noticed severe weight loss and malnutrition despite nutritional supplements that necessitated re-exploration to assess her intestinal length, only to discover that she had a short common channel length, although that her anastomosis was done in a proper way at 200 cm distal to DJ junction, and she required revision to a gastroplasty.

According to Potoczna *et al.* [22], fecal consistency changed significantly after malabsorptive bariatric surgery, such that loose stools and diarrhea became more frequent. In addition, malodorous flatus affecting social life was reported as well. Furthermore, flatus frequency increased, and patients became more bothered by their malodorous flatus. Flatulence severity score correlated inversely with the quality of life estimated by BAROS [23–25].

In terms of our study, fecal consistency changed significantly after surgery, such that we reported loose stools and diarrhea after both procedures, but more reported in group II. In addition, malodorous flatus affecting social life was more frequent in group II than in group I. Furthermore, flatus frequency increased in both groups, but group II patients were more bothered by their malodorous flatus than those of group I; however, quality of life estimated by BAROS in the two groups was surprisingly very good, indicating the incredible effect of weight loss and improvement of preoperative comorbidities on the quality of life.

Limitation of study

Small sample size was a limitation, and therefore, more studies with larger groups and longer follow-up periods are needed.

Conclusion

In performing MGB procedure, measuring the entire small bowel length is recommended before performing the anastomosis to avoid short bowel syndrome in some patients.

Creation of the gastrojejunostomy at fixed length from the ileocecal junction should be done to achieve long-lasting satisfactory maintained EWL with least possible metabolic complications.

MGB has some undesirable effects on fecal consistency and could result in malodorous frequent flatus affecting social life; however, the quality of life following the marvelous loss of weight and improvement of preoperative comorbidities markedly obscures these effects, but longer follow-up is recommended.

In our study, performing single anastomosis gastric bypass with fixed common channel length achieves long-lasting satisfactory maintained EWL with least possible metabolic complications.

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Conflicts of interest

There are no conflicts of interest.

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