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Research Article

Comparative study between Laparoscopic mini-gastric bypass versus laparoscopic single anastomosis sleeve jejunal bypass for treatment of morbidly obese patients

Mohamed A. Abdelzaher[1], Mahmoud Ali Mohamed[1], Khaled M. Mahran[1], and Mohamed Khalaf Allah Kamel[1]

[1] Department of Surgery, Minia University Hospital, Egypt

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Abstract

Background: Bariatric surgery is a long-lasting and efficient method for managing of obesity and curing associated comorbidities. The objective of this study is to compare the short-term results of laparoscopic single anastomosis sleeve jejunal bypass and mini gastric bypass as regard to patient metabolic and nutritional impacts, postoperative weight reduction, and the effects on both. **Patients and methods:** Minia University Hospital was the site of this research. It was a prospective research that compared laparoscopic mini-gastric bypass (MGB) with single anastomosis sleeve jujunal bypass (SASJ). The study contained 60 morbidly obese individuals who were separated into two groups and planned for elective laparoscopic bariatric surgery. In the first group (group A), a single anastomosis sleeve jejunal bypass was performed, and in the second group (group B), a mini gastric bypass was performed. **Results** Thirty individuals had SASJ and thirty had MGB. For the SASJ and MGB groups, the mean age was 37.23±13.9 and 37.1±8.83 years, the body mass index was 52.1±9.12 and 50.14±8.23, the percentage of total weight reduction was 28.3±6 and 27.8±4.7, and the percentage of excess weight loss was 56.4±12.4 and 53.4±11 respectively. In SASJ patients, type two Diabetes was resolved in 75% of cases, hypertension in was improved in 33.3% of cases, and dyslipidemia was improved in 38.1% of cases, compared to type 2 diabetes resolution in 81.5% of cases, hypertension improvement in 28.6%, and dyslipidemia improvement in 38.5% of cases in the MGB group. **Conclusion:** Both MGB and SASJ bypass are effective bariatric procedures for weight loss and treating comorbidities. Laparoscopic SASJ bypass is a safe, simple procedure that can cure patients who are morbidly obese while also resolving co-morbidities. It has comparable post-operative outcomes to MGB.

Keywords: morbid obesity, SASJ, MGB, RYGB

Introduction

The global epidemic of obesity has spread with 10% of the world's population being fat and 20% of the population being overweight, [1]. It is generally known that chronic diseases are the leading causes of mortality globally, and obesity is one of the main risk factors for developing chronic diseases, endangering global health and causing alarm among doctors everywhere [2].

Due to the increased prevalence of obesity and related disorders, effective treatment and prevention are required. Bariatric surgery is associated with greater and more long-lasting weight loss than non-surgical therapy, according to prior studies[3]. Therapeutic therapy of obesity includes dietary and lifestyle modifications, including the adoption of a balanced diet, exercise, and the use of pharmacological medications like orlistat[4].

Gastric banding, Roux-en-Y gastric bypass (RYGB), sleeve gastrectomy (SG), bilian-creatic diversion with duodenal switch, and mini gastric bypass (MGB) are examples of the surgical techniques that have been developed to help patients lose enough weight[5].

MGB considered an established procedure with comparable and efficient results with majority of bariatric operations such as RYGB and Sleeve. It can be used even as a primary weight reduction operation or revision operation in patients who have had previous weight reduction surgery and failed to lose weight or to maintain healthy weight. [6]

Mui et al., modified the Santorini procedure and included a single anastomosis sleeve ileal (SASI) bypass for greater simplicity [7, 8]. Based on the following observations, Mahdy et al., outlined the benefits of the SASI method above other bariatric procedures: In comparison to other procedures, SASI is simpler and takes less time to complete; In contrast to SADI, DS, and DJB, which divide the duodenum, it preserves access to the duodenum so that the biliary tree and the entire gut can be viewed with an endoscope. Additionally, there is no danger of duodenal stump leakage, a significant complication with a reported incidence range of 1-6%; there is relatively little stress on the anastomosis compared to other procedures; and SASI may be reversed or changed into another process [11]. In order to avoid long-term nutritional difficulties, the single anastomosis sleeve jejunal (SASJ) bypass, which is the subject of this study, modifies SASI by reducing biliopancreatic limb length. In patients with significant weight loss and nutritional deficits, the SASJ bypass seems to be both safer and easier to perform than the SASI [8].

The goal of the study was to compare the results of the SASJ with those of the MGB in terms of weight reduction, post-operative complications, and comorbidity resolution 6 months after surgery.

Patients and methods

A prospective comparative study with 60 participants with obesity at the department of general surgery, Minia University Hospitals, 30 patients had laparoscopic single anastomosis sleeve jejunal bypass (SASJ) and 30 patients underwent laparoscopic mini-gastric bypass (MGB). Participants were gathered, and patients were then observed over six months. All the patients who participated in our research gave their informed permission after being informed about the surgery and any potential risks.

Inclusion criteria:

Individuals who were eligible for bariatric surgery and at least 18 to 60 years old, Patients with BMI more than 40, Patients with a BMI more than 35 and high-risk comorbid conditions (such as diabetes mellitus, hypertension, or hyperlipidemia).

Exclusion criteria

Age > 60 or < 18, an untreated mental illness such serious depression or untreated schizophrenia, cancer, liver cirrhosis with portal hypertension, and an inability to follow postoperative dietary requirements are also risk factors.

Preoperative assessment:

Before surgery, a multidisciplinary team reviewed the patients' medical, endocrino-logical, nutritional, and psychological histories. The preoperative checkup included blood testing, cardiology assessments, and chest radiographs. Psychiatric therapists evaluated any mental health contraindications to surgery. Patients' BMI and co-morbidities such diabetes mellitus, hypertension, and obstructive sleep apnea were also assessed.

Surgical procedures:

The surgeon stood between the patient's legs as the patient was positioned in the French position in a steep reverse Trendelenburg posture. With endotracheal intubation and under general anesthesia, all patients were operated.

Five-ports approach was used[12], one 12-mm trocar is used for the camera in the midline, two handbreadths below the xyphisternum, Two 12-mm trocars at mid-clavicular lines below right and left costal cartilage, serve as operating ports, two 5-mm trocars are placed, one as assistant port to mobilise the small bowel (SB) and stomach placed at left anterior

axillary line and the second 5 mm port was placed below xyphisternum for liver retractor.

Laparoscopic SASJ:
Procedure started with the greater omentum separation from the stomach, dissection of the short gastric vessels, dissection of any adhesions between the pancreas and stomach, the upper portion of the dissection was carried out in order to separate the left crus from any attachments and continuous downward dissection to reach the pyloric ring. For a correct sleeve, a 38-French calibration tube was utilized as a guide. Stapling was done to divide the stomach using a linear cutting stapler 60 mm (Ethicon Endosurgery, Johnson and Johnson, GUAYNABO, Puerto Rico, USA), starting 6 cm from the pylorus. A point at the jejunum 200 cm away from the duodenojejunal (DJ) junction was measured, the intestinal loop was then pulled up and sutured with a stay suture to the sleeved portion at the pyloric ring. Using 45 linear cuttings stapler (Ethicon Endosurgery, Johnson and Johnson, GUAYNABO, Puerto Rico, USA) was used to create an antecolic gastrojejunostomy, followed by handsewen suturing for repair the gastro-jejunal anastomosis defect, and an intra-peritoneal drain was placed after a methylene blue test was done to check for leakage.

Laparoscopic MGB:
Beginning with one horizontal stapler loaded with yellow cartridges (Ethicon Endosurgery, Johnson and Johnson, GUAYNABO, Puerto Rico, USA) at the level of the crow's foot, followed by three to four vertical (60-mm) stapler cartridge (Ethicon Endosurgery, Johnson and Johnson, GUAYNABO, Puerto Rico, USA) fired continuously upward to the angle of His, to create a long and narrow gastric tube calibrated with a 38-French bougie, then an antecolic end-to-side gastrojejuno-stomy placed 200 cm distal to the Treitz ligament created using endoscopic stapler, the anastomotic defect was closed by handsewen sutures. All patients had an intraoperative methylene blue test to check for leaks. For 24 hours, an intraperitoneal drain was placed.

Postoperative assessment:
Following surgery, patients were observed for 6 months at intervals of 1, 3 and 6 months. Remission of diabetes is considered partial when HbA1C is reduced by at least 1% or FBS reduction by 25% and considered complete when patient stopped medications and HbA1C became less than 6% and FBS became less than 100 mg/dl. EWL = [(preoperative weight− follow-up weight) / preoperative excess weight] ×100.

Ethical approval:
Study goal was explained to all patients .Procedures used in laboratories and radiology are considered routine care and don't raise any ethical issues. Written informed consents were taken from all participants and was approved by Faculty of medicine ,minia university ethical committee with approval No.318:4/2022

Results
In our study, 60 morbidly obese patients, underwent bariatric surgery, were included. Patients were non-randomly operated (according to surgeon decision after patients counseling) as 30 patients for SASJ (Group A) and another 30 patients for MGB (Group B). They were 47 females (78.3%) and 13 males (21.7%) with an obvious female predominance (Table 1). The mean age was 37.2±13.9 years for the SASJ group and 37.1±8.8 years for the MGB group with no statistical significant difference between both groups. The mean body mass index (BMI) at the time of procedure was 50.1±8.2 kg/m2 in the SASJ group and 52.1±9.1kg/m2 in the MGB group with no statistical difference between both groups also (table 1).

Regarding comorbidities, 28 patients had diabetes mellitus (DM) (93.3%), 18 patients had hypertension (HTN) (60%), 21 patients had hyperlipidemia (70%), 9 patients had osteoarthritis (OA) (30%), and 6 patients had OSAS (20%) for the SASJ group. 27 patients had diabetes mellitus (DM) (90%), 21 patients had hypertension (HTN) (70%), 26 patients had hyperlipidemia (86.7%), 10 patients had osteoarthritis (OA) (33.3%), and 5 patients had OSAS (16.7%) for the MGB group. (Table 2).

The SASJ group achieved mean post-

operative weight of 103.9±20.4 and MGB group reached mean post-operative weight of 105±20.8 at 6 months postoperative. There is no statistically significant difference between both groups postoperative body weight (table3)

Regarding type 2 diabetes mellitus (T2DM) in SASJ group 28 patients had type 2 DM, at 6 months 5 (17.9%) patient showed partial remission and 21(75%) showed complete remission. While in MGB group 27 patients had type 2 DM, at 6 months 3(14.8%) showed partial remission and 22(81.5%) showed complete remission. other patients showed improvement of their glycemic state on a lower dose of insulin and oral hypoglycemic drugs (table 4). There is no statistically significant difference between both groups regarding DM control.

In terms of Hypertension (HTN), in SASJ group 18 patients had HTN, at 6 months 6(33.3%) patient showed control of HTN without further treatment (complete remission). In MGB group 21 patients had HTN, at 6 months 6(28.6%) patient showed control of HTN without further treatment (complete remission). (Table 5)

Table (1): Demographic data of the two studied groups

Variable		***MGB*** *(n=30)*	***SASJ*** *(n=30)*	***P***
Age *(years) Mean ± SD*		37.1 ± 8.83	37.23 ± 13.9	0.956
Sex	*Male*	7 (23.3%)	6 (20%)	0.754
	Female	23 (76.7%)	24 (80%)	
Weight *(kg) Mean ± SD*		145.83 ± 29.3	145.53 ± 28.79	0.968
Height *(cm) Mean ± SD*		167.17 ± 9.52	170.3 ± 11.37	0.252
BMI *(kg/m^2) Mean ± SD*		52.1 ± 9.12	50.14 ± 8.23	0.392

Table (2): Comorbidities distribution between the two studied groups

	MGB *(n=30)*	***SASJ*** *(n=30)*	***P***
Hypertension	21 (70%)	18 (60%)	0.417
DM	27 (90%)	28 (93.3%)	0.640
Dyslipidemia	26 (86.7%)	21 (70%)	0.117
OSAS	5 (16.7%)	6 (20%)	0.739
OA	5 (16.7%)	3 (10%)	0.781

Table (3): Weight distribution between the two studied groups.

	MGB *(n=30)*	***SASJ*** *(n=30)*	***P***
Weight *(kg)*			
Preoperative *Mean ± SD*	145.83 ± 29.3	145.53 ± 28.79	0.968
6 months postoperative *Mean ± SD*	105.01 ± 20.79	103.87 ± 20.39	0.832
P-value*	**<0.001**	**<0.001**	

Table (4): Diabetes state between the two studied groups.

		SASJ	MGB	P value
		N=28	N=27	
Preoperative DM state	*Failure* *Partial remission* *Complete remission*	28(100%) 0(0%) 0(0%)	27(100%) 0(0%) 0(0%)	*1*
Postoperative DM state at 6m	*Failure* *Partial remission* *Complete remission*	3(10.7%) 5(17.9%) 21(75%)	2(7.4%) 3(14.8%) 22(81.5%)	*0.760*

Table (5): Hypertension state between the two studied groups.

		SASJ	MGB	P value
		N=18	N=21	
Preoperative HTN state	*Not improved* *Improved* *Resolved*	18(100%) 0(0%) 0(0%)	21(100%) 0(0%) 0(0%)	*1*
Postoperative HTN state at 6m	*Not improved* *Improved* *Resolved*	2(11.1%) 10(55.6%) 6(33.3%)	5(23.8%) 10(47.6%) 6(28.6%)	*0.588*

Discussion

The most effective treatment for people who are morbidly obese is bariatric surgery, which can enhance quality of life, resolve comorbidities, and help patients to lose weight successfully and permanently [13]. The most often performed bariatric procedures are MGB, RYGB and SG [14].

Preoperative BMI, age, or gender did not differ across the groups analysed statistically (p values = 0.392, 0.956, and 0.754, respectively) in our study.

According to the results of our study, the SASJ group was successful in attaining excess weight loss (EWL) of 56.412.4% at six months, the MGB group attained 53.411 at 6 months, with no statistically significant difference between the two groups.

Elrefai et al., [15] Revealed 53.47 percent EWL after 6 months, with no differences that were statistically significant from the LSG and MGB groups.
Furthermore, Khalaf et al.,[13] reported that % EWL had mean values of 58.7 at 6 months follow up.

Alamo et al.,[16]'s research noticed that there is significant weight loss levels of 56.9% of weight loss over the course of six months after SASJ bypass surgery.

Regarding the improvement of comorbidities, 28 individuals in the SASJ group had type 2 diabetes; at 6 months, 5(17.9%) of those patients achieved partial remission, and 21 (75%) had complete remission. 27 patients in the MGB group had type 2 diabetes, and after 6 months, 3 (14.8%) of them had partial remission and 22 (81.5%) had complete remission. On a reduced dose of insulin and oral hypoglycemic medications, the other patients demonstrated improvement in their glycemic condition. Regarding DM control, there is no statistically significant difference between the two groups.

Elrefai et al.,[15] revealed that there were no differences in the resolution of the co-morbidities of diabetes and hypertension between the study groups (p values = 0.819 and

0.545, respectively), with complete resolution in all eleven cases of DM in the SASJ group at three months, and remaining in the same condition throughout the study's follow-up.

This was in line with the findings of Sayadishahraki et al.,[17], who reported that all patients who underwent Single- Anastomosis Sleeve Jejunal Bypass experienced improved diabetes mellitus over the six-month follow-up period and stopped taking medication and getting insulin therapy.
Sewefy et al.,[18] reported that two months after surgery, the DM had resolved.

Additionally, Mahdy et al., [11] looked at how 61 patients with type 2 diabetes responded to the SASI (single anastomosis sleeve ileal) procedure, which follows the same fundamental principles as SASJ. The research included a year of follow-up. They also had excellent short-term outcomes, with the exception of five individuals whose diabetes had been effectively managed after three months and who needed to progressively stop taking insulin and hypoglycemic medications.
The prospective research design and the fact that no patients were lost follow-up within the first six months of the trial are the study's strong aspects.

Conclusion

Both MGB and SASJ bypass are effective bariatric procedures for weight loss and treating comorbidities. Laparoscopic SASJ bypass is a safe, simple feasible procedure that can cure patients who are morbidly obese while also resolving co-morbidities. It has a short learning curve with comparable post-operative outcomes to MGB.

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References

1. Flegal, K.M., et al., Prevalence of obesity and trends in the distribution of body mass index among US adults, 1999-2010. 2012. **307**(5): p. 491-497.
2. Bauer, U.E., et al., Prevention of chronic disease in the 21st century: elimination of the leading preventable causes of premature death and disability in the USA. 2014. **384**(9937): p. 45-52.
3. Ashrafian, H., et al., Bariatric surgery or non-surgical weight loss for obstructive sleep apnoea? A systematic review and comparison of meta-analyses. 2015. **25**: p. 1239-1250.
4. Ruban, A., et al., Current treatments for obesity. 2019. **19**(3): p. 205.
5. Tham, E., et al., Cesar Roux—the mind behind the Roux-en-Y.2019.**85**(1):p.14-17.
6. Mohamed Deabes, S., M. Abd-Elal Nafh, and A.J.A.-A.M.J. Mohamed Salem Yehia, Comparative study OF outcomes between laparoscopic single anastomosis sleeve ileum bypass (SASI bypass) versus laparoscopic mini-gastric bypass IN morbid obese patients. 2020. **49**(3): p. 957-970.
7. Mui, W.L.-M., D.W.-H. Lee, and K.K.-Y.J.I.j.o.s.c.r. Lam, Laparoscopic sleeve gastrectomy with loop bipartition: a novel metabolic operation in treating obese type II diabetes mellitus. 2014. **5**(2): p. 56-58.
8. Pazouki, A. and M.J.O.s. Kermansaravi, Single anastomosis sleeve-jejunal bypass: a new method of bariatric/metabolic surgery. 2019. **29**(11): p. 3769-3770.
9. Iannelli, A., et al., Laparoscopic sleeve gastrectomy followed by duodenal switch in selected patients versus single-stage duodenal switch for superobesity: case–control study. 2013. **9**(4): p. 531-538.
10. Petrak, F. and S.J.P. Herpertz, Psychodiabetologie. 2019. **64**(6): p. 489-508.
11. Mahdy, T. and C.J.I.j.o.s. Schou, Efficacy of single anastomosis sleeve ileal (SASI) bypass for type-2 diabetic morbid obese patients: gastric bipartition, a novel metabolic surgery procedure: a retrospective cohort study. 2016. **34**: p. 28-34.
12. Rutledge, R.J.O.s., The mini-gastric bypass: experience with the first 1,274 cases. 2001. **11**(3): p. 276-280.
13. Upadhyay, J., et al., Obesity as a disease. 2018. **102**(1): p. 13-33.
14. Khalaf, M. and H.J.O.s. Hamed, Single-anastomosis sleeve ileal (SASI) bypass: hopes and concerns after a two-year follow-up. 2021. **31**: p. 667-674.
15. Elrefai, M., et al., Comparative Study between Single Anastomosis Sleeve Jejunal Bypass, Sleeve Gastrectomy and

One Anastomosis Gastric Bypass: A Prospective Randomized trial. 2022.
16. Alamo, M., et al., Sleeve gastrectomy with jejunal bypass for the treatment of type 2 diabetes mellitus in patients with body mass index< 35 kg/m 2. A Cohort Study. 2012. **22**: p. 1097-1103.
17. Sayadishahraki, M., et al., Single-anastomosis sleeve jejunal bypass, a novel bariatric surgery, versus other familiar methods: results of a 6-month follow-up—a comparative study. 2020. **30**: p. 769-776.
18. Sewefy, A.M. and A.J.S.e. Saleh, The outcomes of single anastomosis sleeve jejunal bypass as a treatment for morbid obesity (Two-year follow-up). 2021. **35**: p. 5698-5704.