Original article

Comparison between Single Anastomosis Sleeve Ileal Bypass and Roux-en-Y Gastric Bypass in obesity management

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Abstract

Background: Obesity is associated with a higher incidence of several diseases, including diabetes, cardiovascular disease, and cancer. Bariatric surgery, regardless of its type, is the most effective approach for treating morbid obesity. This study aimed to compare the outcome of SASI bypass with that of RYGB regarding weight loss, improvement in comorbidities, malnutrition, and postoperative complications.

Methods: Patients with morbid obesity who underwent RYGB or SASI bypass and were followed for 12 months from May 2020 through May 2021 were included in the current prospective study. Weight loss, improvement in comorbidities, complications, and nutritional status were compared between a group of consecutive patients who underwent SASI bypass and a group of patients who underwent RYGB during the same study period.

Conclusion: The average percentage of postoperative weight loss was not significantly different between the two groups. There were no significant differences in the remission of comorbidities between the two groups. Few postoperative complications were reported in both groups. The outcome of SASI bypass and Roux en Yregarding weight loss and improving of comorbidities were satisfactory.

Keywords: Bariatric; bypass; laparoscopic; obesity; Rouxen Y; SASI

INTRODUCTION

Diseases including diabetes, heart disease, and cancer that are linked to obesity have recently emerged as urgent public health issues worldwide[1,2]. A significant number of obese patients are not adequately controlled by medical treatment[1], sobariatric surgery, regardless of kind, treats morbid obesity[3]. Bariatric surgery depends on mainly two strategies to lose weight, even restriction of the amount of food taken by the stomach or bypasses part of the small intestine and hence malabsorptionsuch strategies make bariatric surgery a potential cause for complications[4] Today, Roux-en-Y gastric bypass (RYGB) is a common method in the field of bariatric

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surgery[5]. The laparoscopic Roux-en-Y gastric bypass (LRYGB) is the most well-known and successful weight-loss surgery currently available[6]. However, LRYGB is associated with both early postoperative like complications leakage, hemorrhage, and obstruction and late complications like fistula, stricture, malnutrition, and weight gain [7]. The single anastomosis sleeve ileal (SASI) operation is considered an innovative operation based on two known techniques; the mini gastric bypass and Santoro's operation and it consisted of two main steps; sleeve gastrectomy followed by gastro-ileal anastomosis[4]. It's considered a promising operation, the results of this operation are as good as those obtained after the duodenal switch but without the malabsorption[4]. The purpose of this study was to evaluate the effectiveness of two bariatric surgery approaches; we compared the results (RYGB) bypass with those of (SASI) bypass in terms of weight loss, improvement in comorbidities, and malnutrition.

PATIENTS AND METHODS

Between May 2020 and May 2021, patients who had RYGB or SASI were enrolled in the current study. Patients were compared one year after having gastric bypass surgery (either RYGB or SASI). To avoid confounding effects, both groups were matched in age and sex and baseline clinical characteristics like weight measurement and comorbidities Patients were gathered from the Beni-Suef University Hospital's surgical ward. The Beni-Suef University School of Medicine Ethical Review Board authorized the study, ethical number; FWA 00015574. All participants provided written informed consent before enrollment after the study's goals were outlined.

Patients' allocation: About 62 patients were eligible to be enrolled in the surgery department of Beni-Suef University. About 31 cases of SASI but one case was left to follow up ended up with 30 cases of SASI and 31cases of Roux en Y. All patients who were admitted for bariatric surgery and fulfilled the inclusion criteria were invited to participate in the study. Grossly overweight morbidly obese patients (BMI 40 kg/m2 or 35 kg/m2 with at least one related medical comorbidity) ranging in age from 18 to 60 years old were included in the current study. While patients with endocrine-related obesity, severe mental illness, and those with an ASA score of III or above were not eligible for participation.

Method of choice of Surgery type: Patient's preference after proper medical consultation of advantages and disadvantages of each procedure.

METHODS

Group(1)RYGB

Roux-en-Ygastric bypass (RYGB) entails the construction of agastric pouch, a biliopancreatic limb, a jejunojejunostomy, and a gastrojejunostomy.

Group(2)SASI

Devascularization of the greater curvature of the stomach till the gastroesophageal junction. The stomach was then tabularized over a 36-French calibration tube.The ileocecal junction is identified, and 300 cm is measured upwards. The selected loop is ascended and stapled side to side 6 cm away from the pylorus.

Leak test after any of the two techniques: The methylene blue test is used to ensure a successful anastomosis.

Post-Operative:

A low-calorie, protein-rich liquid diet was prescribed, and patients were instructed to take nutritional supplements for the first month following surgery. In addition, multivitamins was prescribed. Patients were encouraged to exercise from week one.

Statistical analysis of data

The collected data were coded then entered and analyzed using the SPSS version 25 (Statistical Package for social science). Data were described using mean and standard deviation for numerical variables or count and percentages for categorical variables. We test the statistical difference among the studied groups using the proper statistical tests. Statistically significant P-values were 0.05 or less.

Results

Age, sex, height, weight, BMI, and comorbidities were similar between the 31 Roux-en-Y gastric bypass patients and the 30 SASI patients (one SASI patient was lost to follow-up) in this study (Table 1). Weight reduction and % EBWL at 6 and 12 months postoperatively were similar in both groups (table 2). The total number of diabetic cases in both groups was 30 cases. Twenty cases underwent Rouxen

Y operation, and 10 cases underwent SASI operation.

The percent of cases that showed remission of diabetes was 80.9% of cases presented by diabetes in the Roux en Y group (17/20) and 90% in the SASI group (9/10) (P value 0.786). The total number of hypertensive cases in both groups was 21 cases. The percent of cases that showed remission of hypertension was 83.1% of cases presented hypertension in the Roux en Y group (10/12) and 100% in the SASI group (9/9) (P value 0.198).

The total number of GERD in both groups was 30 cases. The percent of cases that showed remission of GERD were 100.0% of patients presented by GERD in the Roux en Y group (29/29) and 100% in the SASI group (1/1) (P value 0.501).

Among all studied patients, there were 41 cases of dyslipidemia. The remission of dyslipidemia was 94.4% (17/18) of cases of dyslipidemia who underwent Roux en Y operation and the remission in SASI was recorded in all patients who underwent SASI operation (23/23). Regarding the improvement of the comorbidities in each operation individually, there was a significant improvement in diabetic, hypertensive, and dyslipidemia cases in each group, and the p-value was statistically significant(Table 3). The mean operative time in the Roux en Y (85±14.4) was lower than in SASI (106.2±17.4) and the P-value was statistically significant at (0.001). Similarly, the mean hospital stay in Roux en Y (1.07 ±0.365) was lower than in SASI (1.53±0.730) and the p-value was statistically significant at 0.003 (table 8)

Discussion:

The effectiveness of the SASI procedure in comparison to the Roux en Y procedure is reported in the present study. The main finding was that there was no statistically significant difference inweight or % of excess body weight loss at six months or 12 months postoperatively. There was no statistically significant difference in remission of diabetes, HTN, or dyslipidemia between the two operative techniques. Regarding the nutritional status postoperatively for both groups, no malnutrition was detected apart from one case in the SASI group.

The non-significant difference in weight measurements between the two procedures after surgery is supportive that both effects are equal in both procedures. In the current study, weight loss was acceptable in both techniques in comparison to other bariatric surgeries and was maintained over one year.

However, in the Roux en Y group; the % EBWL was slightly lower than the %EBWL presented in the literature; 59.5% at 12 months compared to 75% in a study by [8]and 70% by [9].

The SASI group lost weight immediately, weight loss was maintained throughout the follow-up and was greater than those reported with other bariatric procedures [10] These findings corroborated those of Mahdy et al. (2016), who found a significant difference in FBG, HbA1c, cholesterol, and TGs between before and after surgery (4) (table 10).Furthermore, Khalil and Mansy etal.[11] found that the SASI had significantly lower fasting blood glucose and HbA1Cover the first year postoperatively. However bariatric surgeries have been demonstrated to be an efficient method to treat DM, HTN, GERD, and dyslipidemia[4, 12] Those based on malabsorptive bases are more promising [4].

Regarding other preoperative comorbidities, the finding of this study was similar to another research study regarding SASI operation; a previous study compared SASI operation to sleeve gastrectomy, the author studied 58 cases in the SASI group, and the study showed that remission of hypertension was reported in 57.1% (8/14) of cases, and remission of dyslipidemia reported in 87.5% (7/8) of cases [13]

Operative time and hospital stay:

The average operating time for SASI in this study was 106.2 ±17.4 minutes, while the average operative time for Roux en Y was 85±14.4 minutes. Compared to other studies, the mean operative time of SASI was a little bit higher; 11±30.5 min as reported by Mahdy and colleagues.[14]and118.7±14.7 min. as reported by Emile and colleagues [12].

The mean time of hospital stay in SASI (1.53± 0.73) was significantly higher than Roux en Y (1.07±0.36). literature reported a little bit higher figures regarding SASI(15)stating that the mean hospital stay in SASI was2.0 ± 0.1 days, in the [14]'s study the mean postoperative hospital stay was 2.9± 1.7 days.

Conclusion:

The short-term effectiveness of the SASI bypass was shown to be high in the current investigation. When comparing weight loss, comorbidity improvement, malnutrition, and postoperative complications, SASI is on par with Roux en Y,the gold standard of bariatric surgery. The SASI bypass improved DM, HTN, and dyslipidemia after 12 months without much inferior weight loss results.

Tables and figures

Table (1): Baseline characteristics of the studied cases in the two groups:

Variable		Type of operation		P-value
		Roux en Y (N.31)	SASI (N.30)	
Age (Mean ± SD)		39.4±9.7	40.8±10.2	0.615
Sex	Male N %	11 (64.7)	6 (35.3)	0.396
	Female N %	20 (45.5)	24 (54.5)	
Height in meters (Mean ± SD)		1.66±0.09	1.64±.07	0.369
Weight in Kg (Mean ± SD)		127±27	142±23	0. 470
BMI (Mean ± SD)		45.87±7.45	52.62±7.20	0.200
Diabetes mellitus		20 (64.5%)	10 (33.3%)	0.059
Hypertension		12 (38.7%)	9(30%)	0.983
GERD		29(93.5%)	1(3.3%)	§
Dyslipidemia		18 (58%)	23 (76.7%)	0.301

- ***§: p-value couldn't be statistically calculated***

Table (2): Weight measurements at six and twelve months postoperatively in both groups:

Weight measurement	Type of operation				P-value
	Roux en Y N.31		SASI N.30		
	Mean	SD	Mean	SD	
6 months weight (kg)	99.8	22.1	102.5	22.5	0.636
12 months weight (kg)	88	18	88	24	0.997
P-value	0.001		0.002		--
6 months % EBWL	43.4	16.9	48.0	14.4	0.262
12 months % EBWL	59.5	14.9	66.2	18.1	0.127
P -value	<0.001		<0.001		--

% EBWL: % of excess body weight loss

Table (3): Improving comorbidities in the two groups:

Remission			Type of operation		P-value*
			Roux en Y N= 31	SASI N= 30	
DM (N.30)	Yes (N.26)	N.	17	9	0.786
		%	80.9%#	90%	
	No (N.4)	N.	3	1	
		%	19.1%	10.0%	
P-value **			0.001*	0.001*	--
HTN (N.21)	Yes (N. 19)	N.	10	9	0.198
		%	83.3%	100.0%	
	N. (N.2)	N.	2	0	
		%	16.7%	0.0%	
P-value **			0.002*	0.002*	--

Continue table 3.....

GERD (N. 30)	Yes (N.30)	N.	29	1	0.501
		%	100.0%	100.0%	
	No (N. 0)	N.	0	0	
		%	0.0%	100.0%	
P-value **			0.001*	§	--
Dyslipidemia (N.41)	Yes (N.40)	N.	17	23	0.204
		%	94.4%	100.0%	
	No (N.1)	N.	1	0	
		%	5.4 %	0 %	
P-value **			0.003*	0.001*	--

#Percent reported is the column percent, * p-value calculated using the chi-square test for comparing independent categorical variable, ** p-value calculated using Mc-Nemar t-test for comparing paired categorical variables, § # Number of cases with GERD were few than 5 cases. P-value using the MC-Nemar test for paired categorical data couldn't be calculated

Table (4): Comparison between Operative time and hospital stay in both groups

Variable	**Type of operation**				**P-value**
	Roux en Y (N. 30) *		SASI (N. 30)		
	Mean	SD	Mean	SD	
Operative time in minutes.	85.8	14.4	106.2	17.4	0.001*
Hospital stays in days*	1.07	0.36	1.53	0.73	0.003*

***One case that underwent Roux en Y was excluded from the analysis of the meantime of hospital stay to avoid skewing the statistical analysis. This case was complicated with20 days of stay in the hospital.**

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Conflict of interest: None

Authors' contribution: E.M.A conceived the idea of the study, collected data, contributed to the statistical analysis of the data, and wrote the first draft, T.M.N conceived the idea of the study, and substantively revised the work. All other authors were involved in the acquisition of data and revised the work. All authors approved the submitted version.

Ethical approval: The study was approved by the ethical review boards in the Faculty of Medicine Beni Suef University, Approval No. FWA 00015574.

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