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Comparative Study between Laparoscopic Sleeve Gastrectomy and Single Anastmosis Sleeve Ileal Bypass in Management of Morbid Obese Patients

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Abstract

Background: One of the most pressing health issues of our day is the epidemic of obesity and excess weight. When compared to more conventional methods of treating obesity, bariatric surgery has been shown to be the most successful option. The primary objective of this research was to examine the similarities and differences between SG and SASI bypass in terms of weight reduction length, maintenance, failure, cost, time of surgery, learning curve and postoperative complications, and improvement in comorbidities after 12 months of follow-up. Methods: The General Surgery Department at Benha University Hospital was the site of this randomised, prospective clinical trial. Forty patients with morbid obesity who don't regularly consume sweets will be split evenly between two groups, with group I receiving laparoscopic SG and group II receiving laparoscopic SASI. Duration of the trial varied between 6 and 12 months. The present investigation found no statistically significant difference between the two groups in terms of surgical duration or length of hospital stay. When comparing the two groups, there was no discernible change in the preoperative laboratory values analysed. There was a significant difference in ALT levels between the two groups at six months postoperative compared to preoperative levels. Comparing the two groups 12 months after surgery, there was a substantial difference in TLC and HDL levels. Time intervals between preoperative and postoperative measurements of TC, TG, LDL, and FBS were significantly shorter in group 1 (laparoscopic SG) compared to group 2. We found that AST, TC, TG, LDL, and FBS levels in Group 2 (SASI) decreased significantly between pre- and post-operative follow-up periods. While there was a statistically significant rise in HDL between pre- and post-operative follow-up, there was a statistically significant drop in BMI between pre- and post-operative follow-up for both groups. Concerning complications, there was no discernible difference between the two groups. Overall, the SASI bypass has very favourable outcomes, is less invasive than the Santoro's procedure and BPD alterations, and is founded on the physiological principles of digestive adaptation.

Key words: laparoscopic sleeve gastrectomy - single anastmosis sleeve ileal bypass - SASI - morbid obese patients.

1. Introduction

It's common knowledge that bariatric surgery (BS) is the most effective method of dealing with extreme obesity. The World Health Organization reports that the incidence of obesity has tripled since 1975. In 2016, over 39% of people aged 18 and above were overweight, with another 13% being obese. Once again, the United States can thank smoking for the majority of its avoidable fatalities, but this time it's obesity. One-third of American people have a body mass index (BMI) more than 30 kg/m2. This places the United States among the top high-income nations for obesity [1].

Today, sleeve gastrectomy (SG) is one of the most popular weight loss surgeries in the world. Originally intended as a secondary surgery for individuals who were super-morbidly obese (SMO), it has since become a main procedure. Since it was technically feasible, it was immediately accepted by all the bariatric surgery organisations. Multiple studies have shown its safety and usefulness. Patients with SMO present a unique set of difficulties because not just to their size and shape but also to the morbidities that often accompany them. Procedures having a significant malabsorptive component are most useful for this population of patients [2].

Initially, a tiered approach to a final bariatric treatment was advocated, with laparoscopic sleeve gastrectomy (LSG) serving as the first step for patients with SMO. However, LSG is increasingly seen as a last procedure owing to its ease of implementation and promising outcomes in the therapy of comorbidities associated with obesity. Different studies have shown that LSG not only results in considerable and long-lasting weight reduction, but it also aids in the resolution of numerous major comorbidities. Additionally, it aids in the decrease of mortality and the enhancement of quality of life in patients who are overweight [3].

Treatment plans for SMO patients are often organised in stages. The first treatment is an LSG, and the second, more permanent one, is performed a few months later, once the patient has lost weight and gotten their other co-morbid problems under control. The goal of this plan is to lessen the likelihood that these individuals would have serious problems after undergoing a major bariatric operation [2].

Based on Santoro's operation, the Single Anastomosis Sleeve Gastrectomy-Ileal Bypass (SASI) Procedure is a novel metabolic and bariatric surgery in which a sleeve gastrectomy is followed by a side-to-side gastroileal anastomosis [4].

The primary objective of this research was to examine the similarities and differences between SG and SASI bypass in terms of weight reduction length, maintenance, failure, cost, time of surgery, learning curve and postoperative complications, and improvement in comorbidities after 12 months of follow-up.

Methods and Patients, Part 2

Patients with morbid obesity were randomly recruited from the outpatient clinic at Benha University Hospital for this prospective randomised clinical research.

Forty adults with severe obesity who seldom or

never consume sweets were randomly split into two groups.

There were twenty patients in Group I, who all had laparoscopic SG.

Twenty patients in Group II had laparoscopic SASI.

There was an annual time of study.

Definition of Eligibility Patients with a body mass index (BMI) of 40 or above were included in the research because they are candidates for surgical intervention.

Patients with a body mass index (BMI) between 35 and 40 who also have comorbidities connected to obesity (e.g. hypertension, hyperlipidemia, type 2 diabetes mellitus, obstructive sleep apnea, obesity hypoventilation syndrome, non alcoholic fatty liver disease and sever artheritis).

Requirements for non-inclusion:

(1)one who is either younger than 18 or older than 59.

(2) Individuals who are not healthy enough to undergo general anaesthesia (e.g. patients with sever heart disease or untreatable coagulopathies).

(3)Patients with severe cardiovascular or severe restrictive respiratory illnesses, who cannot safely undergo insufflation.

4.Patients with severe mental disease

5. Women who are expecting.

The following procedures were performed on all research participants.

In this study, patients are treated to a thorough history and physical examination, which includes:

Information about the individual, such as name, date of birth, gender, profession, and residential address.

2) A record of earlier interferences.

Clinical Diagnosis

Fourteen, The Date of Hospital Admission

Fifthly, Health and Background Information

1-Thorough clinical examination: Overarching: Vitals (Blood pressure, Temperature, Heart rate, Respiratory rate), Indicators of (Pallor, Cyanosis, Jaundice, and Lymph node enlargement).

BMI

3-Investigations:

Hemoglobin percentage, red blood cell count, white blood cell count, and platelet count are all tests performed in the lab as part of a "Complete Blood Picture."

Serum creatinine, blood urea, and a urinary analysis are all part of a comprehensive renal function test.

Liver Panel: Serum Alanine and Aspartate Aminotransferases (AST and ALT), Albumin, Bilirubin, Prothrombin Time, International Normalized Ratio, and Serum Gamma-Glutamyl Transferase (GGT) (INR).

Total lipids, serum total cholesterol, serum HDL cholesterol, serum triglycerides, serum phospholipids, LDL, VLDL, HDL, and total cholesterol/HDL cholesterol ratio.

Ultrasound of the pelvis and abdomen (USPAP).

Contrast-enhanced CT of the pelvis and abdomen.

Endoscope aimed at the oesophagus, stomach, and duodenum.

Methods in surgery:

The study's variables were as follows:

1. Hemodynamics (non invasive blood pressure (NIBP), heart rate (HR), respiratory rate (RR), and oxygen saturation (Spo2)) are evaluated preoperatively with a thorough history and physical examination.

2.During surgery:o Preoperative evaluation was completed.

Each patient had an 18G/20G cannula inserted into their nondominant hand vein during surgery.

Before anaesthesia, 500–1000 ml of normal saline was infused intravenously (IV).

o Vitals were taken at the start, including pulse, blood pressure (both systolic and diastolic), heart rate, breathing rate, and oxygen saturation (SpO2).

o Throughout the period of operation, these were recorded once every 5 minutes.

o Loading fluids and medications were to be administered at a constant 25 degrees Celsius room temperature.

o The length of operation, as well as the volume of fluids given before and during it, were documented by the attending anesthesiologists.

During the postoperative period, 3 patients' vital signs were monitored in the postanesthesia care unit for 2 hours after surgery.

E)-Administrative Considerations: • Approval was acquired from the Benha University School of Medicine's Department of General Surgery's Ethical Committee

The Institutional Review Board has given its formal permission.

• Permission granted by the medical school's ethical review board (Institutional Research Board IRB)

Ethical factors (F)

All participants provided their informed permission after being given information about the study's procedures and goals.

Participants and the service they received were not harmed in any way by the study's methodology.

All personal information has been securely stored and protected by the lead researchers. The volunteers did not have to pay anything out of pocket, and the researchers paid for everything.

7.Data analysis and management

Information was entered, processed, and analysed using SPSS version 20. (Statistical Package for the Social Sciences). Kruskal-Wallis, Wilcoxon, Chi-square, Logistic Regression Analysis, and Spearman's Correlation Tests were employed to determine statistical significance. For each variable, both parametric and nonparametric data were given, and the appropriate analysis was performed. The threshold for statistical significance was set at a p-value of less than 5%, or 0.05.

Significance level (P-value)

If the probability level is more than 0.05, the result is not significant (NS).

Significant at P 0.05 (S).

Significant at the 0.01-percent level (HS).

Mean, Standard deviation (SD), and range for parametric numerical data; median and Interquartile range (IQR) for non-parametric numerical data; frequency and percentage for non-numerical data are all examples of descriptive statistics.

The statistical significance of a difference in a non-parametric variable between more than two research groups was determined using the Kruskal-Wallis test.

one-way analysis of variance (ANOVA) for normally distributed continuous data. Following analysis of variance (ANOVA), the Mann-Whitney U test was used for further exploration of differences between groups.

3. Results:

Table (1): Operative time and hospital stay between the two studied groups.

	Group I (n=20)	**Group II** (n=20)	**T**	**p**
Operative time (min) Mean ± SD	89.65 ± 16.42	96.43 ± 14.65	1.38	.176
Hospital stay (days) Mean ± SD	2.72 ± 0.678	2.32 ± 0.821	1.68	.101

This table shows that:

There is no significant difference between the two studied groups as regard operative time and hospital stay.

Table (2): Preoperative laboratory parameters between the two studied groups

	Group I (n=20)	**Group II** (n=20)	**T**	**p**
Hemoglobin (g/dl) Mean ± SD	12.86 ± 1.11	13.1 ± 1.45	.588	.561
PLT ($x10^3$/L) Mean ± SD	227.38 ± 34.39	219.33 ± 32.15	.765	.449
TLC ($x10^3$/L) Mean ± SD	6.45 ± 0.888	6.7 ± 0.436	1.13	.266
ALT (U/L) Mean ± SD	26.67 ± 24.95	30.94 ± 26.55	.524	.603
AST (U/L) Mean ± SD	27.22 ± 16.32	28.64 ± 16.11	.278	.783
Creatinine (mg/dl) Mean ± SD	0.921 ± 0.151	0.975 ± 0.131	1.21	.235
TC (mg/dl) Mean ± SD	211.47 ± 34.32	211.97 ± 40.29	.042	.967
TG (mg/dl) Mean ± SD	144.56 ± 71.56	159.71 ± 69.21	.681	.501
LDL (mg/dl) Mean ± SD	145.17 ± 27.42	137.47 ± 32.78	.806	.425
HDL (mg/dl) Mean ± SD	42.35 ± 10.5	42.01 ± 5.11	.131	.897
FBS (mg/dl) Mean ± SD	168.94 ± 56.22	172.6 ± 69.11	.184	.855

This table shows that there is no significant difference between the two studied groups regarding preoperative studied parameters.

Table (3): 6-months postoperative laboratory parameters between the two studied groups.

	Group I (n=20)	**Group II** (n=20)	**t**	**p**
Hemoglobin (g/dl) Mean ± SD	12.17 ± 1.14	12.27 ± 1.47	.241	.811
PLT ($x10^3$/L) Mean ± SD	210.67 ± 35.28	211.67 ± 24.66	.104	.918
TLC ($x10^3$/L) Mean ± SD	6.05 ± 0.715	6.03 ± 1.01	.072	.943
ALT (U/L) Mean ± SD	22.45 ± 13.18	37.44 ± 23.39	**464**	**.018**
AST (U/L) Mean ± SD	20.27 ± 13.45	35.44 ± 18.31	**316**	**.005**
Creatinine (mg/dl) Mean ± SD	9.02 ± 0.587	0.942 ± 0.159		
TC (mg/dl) Mean ± SD	173.24 ± 29.19	164.94 ± 24.66	.971	.338
TG (mg/dl) Mean ± SD	110.06 ± 44.09	113.09 ± 30.63	.252	.802
LDL (mg/dl) Mean ± SD	112.94 ± 22.83	102.94 ± 23.99	1.35	.185
HDL (mg/dl) Mean ± SD	45.25 ± 8.04	46.9 ± 3.23	.852	.400
FBS (mg/dl) Mean ± SD	107.44 ± 12.39	105.36 ± 10.57	.571	.571

This table shows that:
There is a significant difference between the two studied groups regarding ALT.

Table (4): 12-months postoperative laboratory parameters between the two studied groups

	Group I (n=20)	**Group II** (n=20)	**t**	**P**
Hemoglobin (g/dl) Mean ± SD	12.31 ± 1.32	12.55 ± 1.65	.508	.614
PLT ($x10^3$/L) Mean ± SD	214.33 ± 34.01	213.25 ± 30.38	.106	.916
TLC ($x10^3$/L) Mean ± SD	5.97 ± 0.658	6.51 ± 0.873	**2.21**	**.033**
ALT (U/L) Mean ± SD	20.53 ± 11.67	24.97 ± 20.91	.829	.412
AST (U/L) Mean ± SD	18.64 ± 9.52	17.55 ± 10.34	.347	.731
Creatinine (mg/dl) Mean ± SD	9.21 ± 0.662	0.911 ± 0.187		
TC (mg/dl) Mean ± SD	150.27 ± 24.52	145.73 ± 22.34	.612	.544
TG (mg/dl) Mean ± SD	89.79 ± 33.89	93.97 ± 28.37	.423	.675
LDL (mg/dl) Mean ± SD	92.86 ± 21.98	89.61 ± 20.61	.482	.632
HDL (mg/dl) Mean ± SD	45.77 ± 5.07	49.74 ± 3.71	**2.83**	**.007**
FBS (mg/dl) Mean ± SD	87.34 ± 9.21	86.22 ± 9.84	.372	.712

This table shows that there is a significant difference between the two studied groups as regard TLC and HDL.

Table (5) Preoperative and postoperative laboratory parameters among Group I.

	Group I (n=20)			**P**[#]
	Preoperative	6m postop.	12m postop.	
Hb (g/dl) Mean ± SD	12.86 ± 1.11	12.17 ± 1.14	12.31 ± 1.32	.164
PLT ($x10^3$/L) Mean ± SD	227.38 ± 34.39	210.67 ± 35.28	214.33 ± 34.01	.283
TLC ($x10^3$/L) Mean ± SD	6.45 ± 0.888	6.05 ± 0.715	5.97 ± 0.658	.111
ALT (U/L) Mean ± SD	26.67 ± 24.95	22.45 ± 13.18	20.53 ± 11.67	.534
AST (U/L) Mean ± SD	27.22 ± 16.32	20.27 ± 13.45	18.64 ± 9.52	.108
Creatinine (mg/dl) Mean ± SD	0.921 ± 0.151	9.02 ± 0.587	9.21 ± 0.662	
TC (mg/dl) Mean ± SD	211.47 ± 34.32	173.24 ± 29.19	150.27 ± 24.52	**.000**
TG (mg/dl) Mean ± SD	144.56 ± 71.56	110.06 ± 44.09	89.79 ± 33.89	**.006**
LDL (mg/dl) Mean ± SD	145.17 ± 27.42	112.94 ± 22.83	92.86 ± 21.98	**.000**
HDL (mg/dl) Mean ± SD	42.35 ± 10.5	45.25 ± 8.04	45.77 ± 5.07	.369
FBS (mg/dl) Mean ± SD	168.94 ± 56.22	107.44 ± 12.39	87.34 ± 9.21	**.000**

repeated measures ANOVA.

This table show that there a significant decrease from preoperative to postoperative follow up time intervals regarding TC, TG, LDL, and FBS.

Table (6) Pre and postoperative laboratory parameters among Group II.

	Group II (n=20)			**P**[#]
	Preoperative	6m postop.	12m postop.	
Hb (g/dl) Mean ± SD	13.1 ± 1.45	12.27 ± 1.47	12.55 ± 1.65	.225
PLT ($x10^3$/L) Mean ± SD	219.33 ± 32.15	211.67 ± 24.66	213.25 ± 30.38	.684
TLC ($x10^3$/L) Mean ± SD	6.7 ± 0.436	6.03 ± 1.01	6.51 ± 0.873	.052
ALT (U/L) Mean ± SD	30.94 ± 26.55	37.44 ± 23.39	24.97 ± 20.91	.259
AST (U/L) Mean ± SD	28.64 ± 16.11	35.44 ± 18.31	17.55 ± 10.34	**.002**
Creatinine (mg/dl) Mean ± SD	0.975 ± 0.131	0.942 ± 0.159	0.911 ± 0.187	.457
TC (mg/dl) Mean ± SD	211.97 ± 40.29	164.94 ± 24.66	145.73 ± 22.34	**.000**
TG (mg/dl) Mean ± SD	159.71 ± 69.21	113.09 ± 30.63	93.97 ± 28.37	**.000**
LDL (mg/dl) Mean ± SD	137.47 ± 32.78	102.94 ± 23.99	89.61 ± 20.61	**.000**
HDL (mg/dl) Mean ± SD	42.01 ± 5.11	46.9 ± 3.23	49.74 ± 3.71	**.000**
FBS (mg/dl) Mean ± SD	172.6 ± 69.11	105.36 ± 10.57	86.22 ± 9.84	**.000**

repeated measures ANOVA.

This table show that there a significant decrease from preoperative to postoperative follow up time intervals regarding AST, TC, TG, LDL and FBS. While there a significant increase from preoperative to postoperative follow up time intervals regarding HDL

Table (7): Preoperative and postoperative BMI between the two groups

BMI (kg/m^2)	**Mean ± SD**			**P#**
	Preoperative	6m postop.	12m postop.	
Group I	46.83 ± 8.79	35.05 ± 8.87	30.01 ± 7.96	**.000**
Group II	49.6 ± 9.11	36.55 ± 6.07	31.22 ± 4.89	**.000**

repeated measures ANOVA.

This table show that there a significant decrease from preoperative to postoperative follow up time intervals regarding BMI in both groups.

Table (8): Postoperative Complications between the two studied groups

	Group I (n=20)	**Group II** (n=20)	χ^2	**p**
Bleeding	1 (5%)	2 (10%)	.360	.548
Stenosis	1 (5%)	0	1.03	.313
Biliary gastritis	1 (5%)	1 (5%)	--	**1**

This table shows that:

There is no significant difference between the two studied groups regarding complications.

4. Discussion

The present investigation found no statistically significant difference in operational time or length of stay between the two groups.

In agreement with our findings, Vilallonga et al. [5] found that both groups had similar operation and hospitalisation times.

Mohamed Deabes et al. [6] similarly showed that the two included procedures were equivalent in terms of surgical time.

However, contrary to the findings of Khalil et al. [7], we found no statistically significant differences in mean operation times amongst the groups we analysed. This finding is functionally comparable to single anastomosis duodenal-ileostomy and duodenal-jejunal bypass, with less nutritional and surgical problems, and it is shown in laparoscopic sleeve gastrectomy with loop bipartition.

At 6 months post-op, there was a substantial difference in ALT levels between the two groups in the research at hand. Comparing the two groups 12 months after surgery, there was a substantial difference in TLC and HDL levels.

Time intervals between preoperative and postoperative measurements of TC, TG, LDL, and FBS were significantly shorter in group 1 (laparoscopic SG) compared to group 2.

Salminen et al. [8] found that three and five years after surgery, both groups had better glycemic control than they had at baseline. After 5 years, there was no statistically significant difference in mean estimated fasting plasma glucose levels between the study groups: 135.1 (95% CI, 124.3-147.8) mg/dL (7.5 [95% CI, 6.9-8.2] mmol/L) in the sleeve gastrectomy group and 120.7 (95% CI, 109.9-131.56.7) mg/dL (6.7 [95% CI, 6.1-7.3] mmol/L) in There was no significant difference in glycated haemoglobin levels across the study groups. The mean estimated HbA1c value during the course of the follow-up period was 6.6% (95% CI, 6.4%-6.8%) in the sleeve gastrectomy group and 6.6% (95% CI, 6.4%-6.8%) in the gastric bypass group (P =.93).

While they did not find a statistically significant difference in total cholesterol levels between the groups after 5 years of follow-up (P =.053): the sleeve gastrectomy group at 189.2 (95% CI, 181.5-193.1) mg/dL (4.9 [95% CI, 4.7-5.0] mmol/L) and the gastric bypass group at 177.6 (95% CI, 173.8-185.3) mg/dL (4.6 [95% CI, 4.5-4.8] mmol/L). At 5 years, patients in the gastric bypass group had LDL-C levels of 96.5 (95% CI, 88.0-100.4) mg/dL (2.5 [95% CI, 2.3-2.6] mmol/L) compared to 104.3 (95% CI, 100.4-112.0) mg/dL (2.7 [95% CI, 2.6-2.9] mmol/L) in the sleeve gastrectomy group (P =.02). During the study period, the sleeve gastrectomy group had a mean estimate of triglyceride levels of 109.7 (95% CI, 102.7-116.8) mg/dL (1.2 [95% CI, 1.2-1.3] mmol/L) and the gastric bypass group had a mean estimate of 102.7 (95% CI, 96.5-109.7) mg/dL (1.2 [95% CI, 1.1-1.2] m There were no significant variations in HDL-C levels over time across the study groups, with mean estimations of 53.3 (95% CI, 51.4-55.6) mg/dL (1.4 [95% CI, 1.3-1.4] mmol/L) and 53.7 (95% CI, 51.7-56.0) mg/dL (1.4 [95% CI, 1.3-1.5] mmol/L), respectively (P =.79). [8].

Patients who had gastric bypass in the research by Peterli et al., [9], on the other hand, had considerably lower LDL-C values than those who underwent sleeve gastrectomy.

The resolution of diabetes was higher in the LSGB group than in the LSG group (92 vs. 48%; P=0.03), as reported by Khalil et al.[7]. At 1, 3, 6, and 12 months after surgery, the LSGB group had substantially lower fasting blood glucose and glycated haemoglobin (HbA1c) values than the LSG group. Mean HbA1c decrease in the LSGB group was 4.5 percentage points at one year postoperatively, compared to 3.5 percentage points in the LSG group. There was no statistically significant difference in diabetes resolution between the two groups during the first 3 months after surgery, but

this changed over the subsequent 6 months of follow-up. All patients had a significant drop in blood lipid levels after a year.

Researchers Mohamed Deabes et al. [6] found that fasting blood glucose, haemoglobin A1c, triglycerides, cholesterol, high-density lipoprotein (HDL), and low-density lipoprotein (LDL) all varied significantly between pre- and post-operative periods.

We found that AST, TC, TG, LDL, and FBS levels in Group 2 (SASI) decreased significantly between pre- and post-operative follow-up periods. Despite this, HDL levels were shown to have increased significantly during preoperative and postoperative follow-up periods.

Our findings are consistent with those of Mohamed Deabes et al. [6], who found a significant difference between pre- and post-operative mean values for fasting blood glucose, haemoglobin A1c, triglycerides, cholesterol, HDL, and LDL in the SASI group.

Our findings were consistent with those of Mahdy et al. [10], who found that FBG, HbAIC, triglyceride, cholesterol, HDL, and LDL all varied significantly between pre- and post-operative periods.

An increase in haemoglobin levels was not statistically significant (p= 0.23), but serum iron levels decreased significantly (p= 0.02), serum albumin levels decreased significantly (p= 0.007), and vitamin D levels increased significantly (p 0.0001) at 12 months after SASI bypass, as reported by Mahdy et al. [11]. Despite the drop in blood albumin levels, the average serum albumin level after SASI was within normal range (3.9 g/dl), and no patients exhibited protein mal- absorption postoperatively.

In the current study, researchers found that both groups' body mass index (BMI) decreased significantly from pre- to post-operative follow-up periods.

Our findings were consistent with those of Mahdy et al. [12], who found that after 6 and 12 months after the three surgeries, patients lost a substantial amount of weight and body mass index (BMI) compared to their initial levels. Six months following surgery, patients who had SASI bypass had a lower body mass index (BMI) and weight than those who underwent SG or OAGB (p = 0.01 and 0.04, respectively). Body weight and body mass index were also considerably decreased 12 months after SASI bypass compared to SG and OAGB (p 0.0001). Traditionally, it has been thought that the SASI bypass represents the ideal bariatric treatment since it induces weight reduction not by mechanical restriction and malabsorption but rather through limitation of function and manipulation of the neuroendocrine regulation of appetite and fullness. The term "digestive adaption method," coined by Santoro and colleagues, describes this [4].

The neuroendocrine response generated by the early reception of nutrients in the distal bowel, stimulating the secretion of satietogenic distal gut hormone, reducing the activity of the proximal bowel, and inducing a hypothalamic-mediated satiety sensation, is the primary cause of weight loss following a gastric bypass or a sleeve gastrectomy. There has been no assessment of hormonal alterations after SASI bypass in humans, however. Future prospective studies are needed to examine the consequences of this phenomena on the enteric hormones, since some food makes its way past the duodenum into the regular channel [13].

Mahdy et al. [11] found that body mass index (BMI) decreased significantly from baseline to 12 months following SASI bypass (from 43.2 12.5 to 31.2 9.7 kg/m2; p 0.0001). At 12 months of follow-up, there was also a notable drop from pre-op body weight of 119.3 37.9 to 86.4 29.6 kg.

In the research of Salminen et al., [8], the estimated mean percentage excess weight reduction at 5 years was 49% (95% CI, 45%-52%) after sleeve gastrectomy and 57% (95% CI, 53%-61%) after gastric bypass. The model-based estimate of mean percentage excess weight reduction at 5 years was 8.2 percentage units (CI, 3.2%) more in the gastric bypass group than in the sleeve gastrectomy group.

As far as problems go, the present research found no discernible difference between the two groups.

In accordance with our findings, research of Mohamed Deabes et al., [6] as they demonstrated that there was no significant difference between the two analysed groups as respect complications.

In a similar vein, Vilallonga et al. [5] found no statistically significant differences between the two groups in terms of either short- or long-term problems after surgery.

Mahdy et al [12] .'s investigation corroborated our findings, reporting that one patient had short-term difficulties after OAGB (pouch gangrene and perforation) and three patients following SASI bypass (bleeding and blockage), while no short-term issues were noted following SG. Short-term problems were more common with SASI bypass, although there was no statistically significant difference between the three surgeries (SG had none, OAGB had one, and SASI bypass had four).

Hypoalbuminemia was a long-term problem experienced by two patients who had SG, nine patients who had OAGB, and nine patients who had SASI bypass. Due to vitamin deficiencies, SASI bypass induced peripheral neuropathy in two cases. Complication rates over the long term were significantly different for the three methods (2%, 9.8%, and 14.9%, respectively; p = 0.005). The median percentage of small bowel bypassed in patients who did not develop hypoalbuminemia after SASI bypass was 50% (range, 40-57%), compared to 53.8% in the nine patients who developed hypoalbuminemia. One percent, two and a half percent, and four percent readmission rates, respectively, were statistically indistinguishable (p = 0.45). Readmissions following OAGB occurred because to symptoms such as stomach discomfort, fever, acute pancreatitis, and the necessity for a pouch revision [12].

Seven of the ten reoperations after sleeve gastrectomy were for severe reflux, and patients converted to gastric bypass at a median of 14 months, as reported by Salminen et al. [8]. (range, 6-59 months). Seventeen patients in the gastric bypass group needed further surgery for suspected herniation, and all of them had their mesenteric defect closed during the second laparoscopic procedure. Throughout the duration of the 5-year follow-up, no deaths could be directly attributed to the therapy.

5. Conclusion

SASI bypass is a promising procedure with excellent outcomes; it is based on the physiologic principles of digestive adaptation; it is simpler to do than the Santoro's operation and BPD alterations; and it has a shorter recovery time.

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