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Comparative effectiveness of one Anastomosis Gastric Bypass (OAGB) and sleeve gastrectomy (SG) in obese patients

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Abstract:

Background Obesity provides a public health problem and a significant medical, with a global economic burden assessed at $1.72 trillion worldwide.

Methods This was observational research conducted on 300 obesity patients at Zliten Medical Center. The cases have been separated into 2 groups: Group I: 150 cases had a one anastomosis gastric bypass; group II: 150 cases had sleeve gastrectomy.

Results A statistically insignificant distinction has been observed among the examined groups regarding glucose, systolic blood pressure, and diastolic blood pressure. However, statistically significant distinction has been noted regarding total cholesterol, HbA1c, HDL cholesterol, LDL cholesterol, triglycerides, weight loss in kilograms, and body mass index reduction. A statistically insignificant distinction has been observed among the examined groups regarding HbA1c, glucose, diastolic blood pressure, systolic blood pressure, and triglycerides. However, a statistically significant distinction has been noted regarding the decrease in the number of total cholesterols, medications, HDL cholesterol, and LDL cholesterol.

Conclusion The research revealed insignificant distinctions among SG and OAGB post-surgery regarding lipids, diastolic blood pressure, glucose levels, systolic blood pressure, and HbA1c. OAGB demonstrated better results relative to SG according to body mass index and loss of weight.

Keywords: OAGB. SG. Obesity

1. Introduction

Obesity provides a significant medical & public health issue, imposing a global economic burden assessed at $1.72 trillion [1].

In the past years, the frequency has continued to increase globally, leading to the rise of several illnesses, including cardiovascular disease, diabetes, joint disorders, sleep apnea ,infertility ,GERD ,pseudo-tumor cerebri [2].

By 2050, it is projected that fifty percent of the women population & sixty percent of the male population would be affected by obesity [3].

The annual global incidence of bariatric operations is on the rise. Bariatric operation considered as the only therapy technique that has consistently exhibited sustainable loss of weight & resolution of comorbidities in cases with severe obesity [4].

One anastomosis gastric bypass is a viable choice for SSO cases, as it is comparable to LSG according to safety and has the potential to produce better results according to weight loss and comorbidity remission. Regarding reports, OAGB considered as safe for SSO cases have a body mass index more than sixty kilogram per square meter and appears to be even more effective than OAGB according to weight loss and decreased complications. There remains a lack of data regarding the comparison of one anastomosis gastric bypass and laparoscopic sleeve gastrectomy in cases with morbid obesity [5].

Postoperative weight regain, gastroesophageal reflux disease, hemorrhage and leak, are all common complications of sleeve gastrectomy. One anastomosis gastric bypass has become an effective and safe alternative in obese cases in the past few years, and its application has been on increasing. Nevertheless, it was proposed that one anastomosis gastric bypass could elevate the probability of bile reflux and its associated complications. Within the past few years, many investigations have compared the efficacy and safety of sleeve gastrectomy and one anastomosis gastric bypass, frequently showing inconsistent results [6].

At present, the one anastomosis gastric bypass is a new treatment choice that bariatric surgeons may provide to cases who suffer from weight loss failure following sleeve gastrectomy. An attractive alternative appears to be the revision of sleeve gastrectomy to one anastomosis gastric bypass, despite its inadequate description [7].

This investigation objected to evaluate the effectiveness of sleeve gastrectomy and one anastomosis gastric bypass within treating obesity.

2. Patients and Methods

This was observational research done on three hundred obesity patients at Zliten Medical Center. The patents have been classified into two groups: Group I: 150 cases had a one Anastomosis Gastric Bypass; group II: 150 cases had Laparoscopic sleeve Gastrectomy (SG).

Inclusion criteria: Cases exhibiting a BMI above forty or a body mass index exceeding thirty-five associated with at least one comorbidity (body mass index calculated as weight in kilograms divided by height in meters square), aged between eighteen & sixty-five years, and who hadn't responded to conservative treatment for a duration of two years.

Exclusion criteria: Cases contraindicated for major abdominal operation, those with a history of bariatric operation, severe symptomatic gastroesophageal reflux illness inactive to medication, anticipated dense adhesions in the small bowel, large hiatal hernia and a history of inflammatory bowel disorder.

Methods

All cases had a medical history assessment, & current treatment for hypertension, DM, & dyslipidemia have been documented. Body mass index & blood pressure have been recorded both preoperatively and postoperatively. Patients were informed by the bariatric surgeon, endocrinologist, and dietitian of potential perioperative problems, possible postpartum deficiencies, and required nutritional supplementation.

Surgical procedure

OAGB

Utilizing the Visitor technique, a twelve-millimeter supraumbilical port was inserted into the upper abdomen (closed method by verse needle technique). Two additional fifteen millimeter and eleven-millimeter ports were inserted into the right and left hypochondriums. A subxiphoid incision was

made utilizing a five-millimeter port for the placement of a liver retractor. A long, narrow gastric pouch has been constructed with a sixty-millimeter Endo-GIA stapler ®. A gastrojejunostomy was conducted 180 centimeters distal to the ligament of Treitz utilizing a sixty-millimeter Endo-GIA ® linear stapler, and then closure of the stapler entry [8,9]. No variance was observed in the technique of gastrojejunostomy between the cases. A patency test and endoscopic leak was conducted at the finish of the surgery. One drain has been located at the splenic side. Cases have been instructed to administer lansoprazole thirty milligrams daily for a duration of six months. They have been additionally advised to consume a multivitamin/mineral tablet and be given vitamin B12 injections every 3 months for the duration of their life.

SG

The technique involved dissecting the greater omentum and dividing the greater gastric curvature upwards. The gastric transection was done utilizing a sixty-millimeter Endo-GIA stapler ®, aiming for a regular shape and preventing the gastric lumen. During surgery endoscopy verified intraluminal hemorrhage and evaluated the integrity and size of the stapler line. Cases have been instructed to administer lansoprazole daily during a duration of six months and to consume a multivitamin/mineral tablet for about 6 months.

Follow-Up: All cases had been monitored by the endocrinologist and surgeon every three months throughout the initial year following surgery, every six months in the 2nd year post-surgery, & subsequently on an annual schedule for life. The assessment of anthropometric parameters and the resolution of comorbidities had been conducted. Blood samples had been collected at each monitoring visit to assess any nutritional deficiencies and to prescribe appropriate supplementation based on laboratory findings. Upon the identification of a nutritional deficiency, targeted supplementation had been recommended. Medical treatment, including antihypertensive, antidiabetic, & hypolipemiant medications, had been modified based on the case's current need.

Biochemical evaluations: Biochemical parameters had been assessed using serum samples collected following an overnight fast, including HbA1c, low-density lipoprotein cholesterol (LDL-c), triglycerides, serum total cholesterol (Tc), high-density lipoprotein cholesterol (HDL-c) and fasting glucose. Concentrations of insulin resistance had been assessed utilizing the homeostasis model evaluation of insulin resistance (HOMA-IR) formula: $mU/mmol/L^2$ = fasting insulin (mU/L) x fasting glucose (mmol/L)/22.5. Primary outcome: After six months, both therapies significantly decreased body mass index reduction in kilograms and percent excess weight throughout the observation duration, with significant variances among the groups.

Statistical analysis

All statistics have been computed utilizing SPSS statistical software (version 22.0; IBM Corp., Armonk, NY, United States of America). The Kruskal-Walli's test has been utilized to assess the contingency tables of the categorical parameters. Data is represented as the mean ± standard deviations or median (interquartile range). Statistical significance has been assessed at a P-value less than 0.05.

3. Results

Table 1shows that, a statistically insignificant variance has been observed among the examined groups according to Weight, BMI and CCI Score while there was statistically significant variance according to Age and Sex.

Table 2 shows that a statistically insignificant variance has been observed among the examined groups according to glucose, systolic & diastolic blood pressure, a statistically significant variance has been observed among the studied groups as regards total cholesterol, HbA1c, HDL cholesterol, LDL cholesterol & triglycerides.

Table 3 shows that, a statistically significant variation among the examined groups according to kilogram lost and BMI reduction.

Table 4 shows that, a statistically insignificant variance has been observed among the examined groups according to HbA1c, glucose, systolic blood pressure, triglycerides and diastolic blood pressure, while a statistically significant variance has been observed among the examined groups according to reduction in no medications, HDL cholesterol, LDL cholesterol & total cholesterol.

Table 1 Distribution of baseline characteristics among the examined groups.

		OAGB Number = 150		**SG Number=150**		**P-Value**
		Mean ± standard deviations		**Mean ± standard deviations**		
Age (years)		52.4 ± 9.2		55.2 ± 9.5		0.01
Weight (kg)		127.6 ± 20.2		129.0 ± 20.6		0.5
BMI (kg/m2)		42.8 ± 5.1		42.2 ± 5.5		0.3
BMI (kg/m2)		1.3 ± 1.5		1.5 ± 1.6		0.2
		N	**%**	**N**	**%**	
Sex	Male	87	(58.3%)	119	(79.2%)	0.001
	Female	63	(41.7%)	31	(20.8%)	

P value <0.05 is statistically significant, P value >0.05: Not significant, SD: Standard deviation, p<0.001 is highly significant, BMI: Body mass index, CCI: Charlson Comorbidity Index.

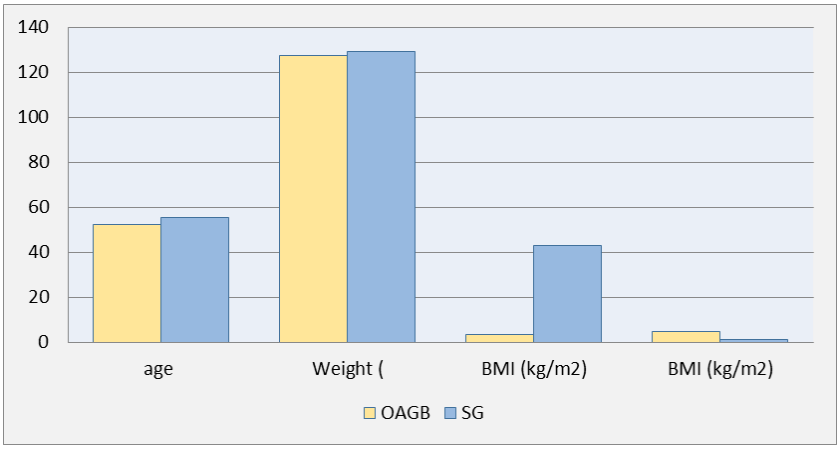


Figure 1 Distribution of demographic data among the examined groups.

Table 2 Distribution of clinical data before surgery among the examined groups.

	OAGB Number = 150	**SG Number=150**	

	Mean ± Standard deviation	Mean ± Standard deviation	P- Value
Glucose (mg/dL)	101.8 ± 28.5	108.4 ± 57.0	0.2
HbA1c (%)	5.5 ± 0.5	5.9 ± 0.5	≤0.001
Total Cholesterol (mg/dL)	167.6 ± 37.5	181.6 ± 35.5	0.001
LDL Cholesterol (milligram per deciliters)	100.9 ± 33.7	117.2 ± 29.2	≤0.001
HDL Cholesterol (milligram per deciliters)	44.9 ± 17.6	41.6 ± 7.9	0.03
Triglycerides (mg/dL)	111.1 ± 62.9	126.9 ± 62.1	0.02
Systolic Blood Pressure (mmHg)	124.9 ±13.9	122.7 ± 13.5	0.16
Diastolic Blood Pressure (mmHg)	75.1 ± 9.9	76.4 ± 10.5	0.27

HDL: High density lipoprotein, Hb A1c: Hemoglobin A1C, LDL: Low density lipoprotein.

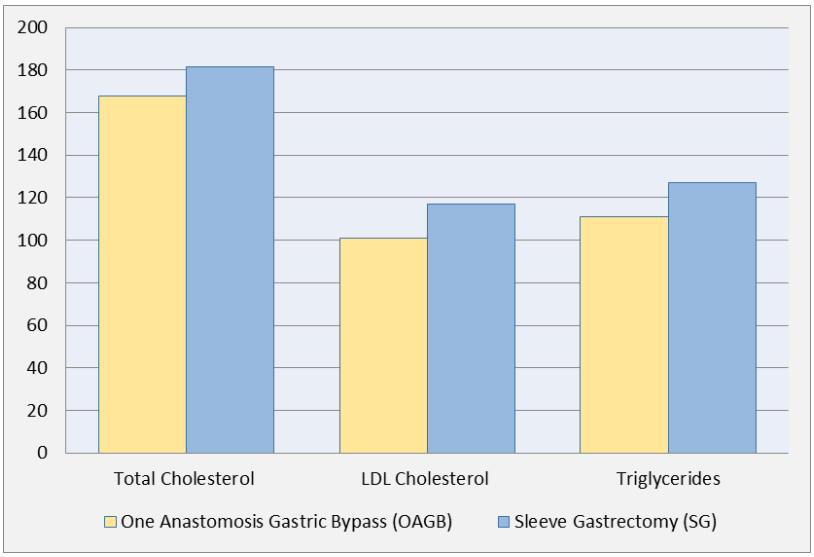


Figure 2 Distribution of clinical data before surgery between the studied groups.

Table 3 Distribution of Primary Outcomes for Weight Reduction after surgery between the studied groups.

	OAGB Number = 150	**SG Number=150**	
	Mean ± SD	**Mean ± SD**	**P-Value**
Kilogram Lost			
6 Months Post Surgery	33.8 ± 12.7	23.1 ± 17.6	< 0.001
BMI Reduction			
6 Months Post Surgery	10.9 ± 4.0	7.7 ± 6.1	< 0.001

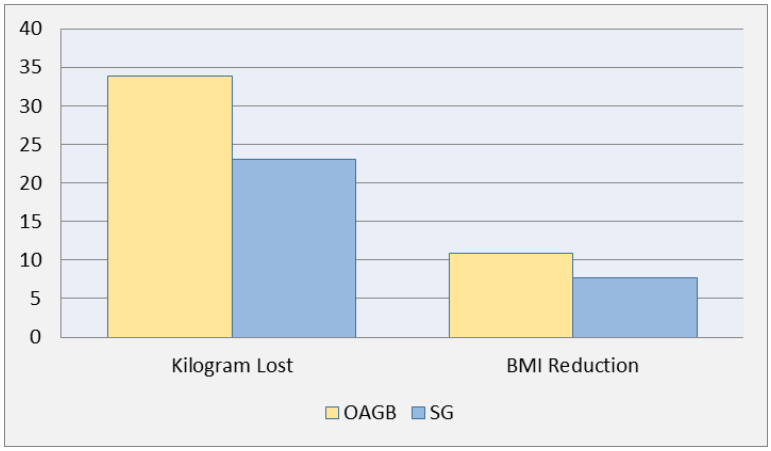
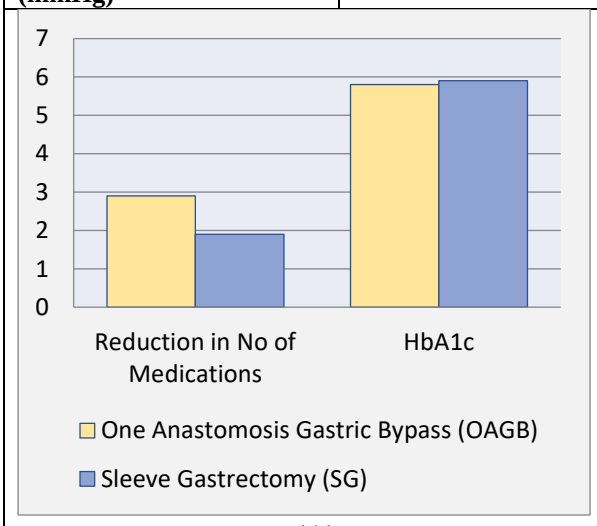


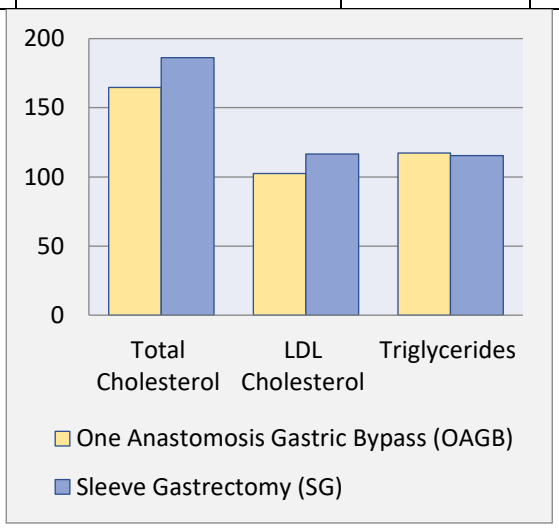
Figure 3 Primary Outcomes for Weight Reduction.

Table 4 Distribution of clinical data after surgery between the studied groups

	OAGB Number = 150	**SG Number=150**	
	Mean ± SD	**Mean ± SD**	**P- Value**
Reduction in No of Medications	2.9 ± 3.4	1.9 ± 2.9	0.006
Glucose (mg/dL)	100.5 ± 36.7	99.5 ± 29.8	0.79
HbA1c (%)	5.8 ± 1.4	5.9 ± 1.5	0.55
Total Cholesterol (mg/dL)	164.8 ± 45.9	186.3 ± 62.0	≤0.001
LDL Cholesterol (milligram per deciliters)	102.5± 40.3	116.6 ± 57.9	0.01
HDL Cholesterol (milligram per deciliters)	41.3 ±12.2	46.4 ± 18.4	0.005
Triglycerides (mg/dL)	117.2 ± 81.2	115.3 ± 109.9	0.86
Systolic Blood Pressure (mmHg)	125.6 ± 26.1	129.3 ± 45.7	0.38
Diastolic Blood Pressure (mmHg)	75.7 ± 17.5	77.3 ± 23.0	0.49



(A)



(B)

Figure 4. (A) Distribution of Reduction in No of Medications &Hb A1c after surgery between the studied groups. (B) Distribution of clinical data after surgery between the examined groups.

4. Discussion

Our research indicated a statistically insignificant distinction has been in the distribution of characteristics, specifically weight, BMI, and CCI score, among the OAGB group and the SG group; however, a statistically significant distinction has been observed concerning gender and age.

In agreement with our results Schmitz et al. aimed to compare the result of SSO cases undergoing one anastomosis gastric bypass comparing with laparoscopic sleeve gastrectomy (LSG), they reported that there was statistically insignificant between two groups as regard age, while there was statistically significant as regard Sex, Weight and BMI [6].

Also, in agreement with Plamper et al. there was statistically significant between OAGB and SG group as regard age, sex, weight and BMI [10].

As well, in agreement with Mahdy et al. aimed to compare the results of three bariatric operations utilizing different weight loss mechanisms: sleeve gastrectomy (restrictive mechanism), one anastomosis gastric bypass (mixed restrictive and malabsorptive mechanism), and the recently proposed Single Anastomosis Sleeve Ileal bypass (bipartition method). The three methods were evaluated and contrasted regarding weight loss, enhancement of comorbidities, and problems, they stated that statistically insignificant was discovered among SG group, OAGB group and SASI group as regard weight and BMI and sex, while statistically significant was discovered among examined groups according to age [11].

Our study demonstrated that the distribution of clinical data prior to surgery was consistent among the OAGB group and the SG group. We discovered statistically insignificant differences among the groups concerning systolic blood pressure, glucose, & diastolic blood pressure. However, there were statistically significant differences regarding HbA1c, Total Cholesterol, HbA1c, LDL Cholesterol, Triglycerides, & HDL Cholesterol.

In accordance with our results Schmitz et al. found there was statistically insignificant between two groups as regard type 2 diabetes mellitus and Hypertension [6].

Also, agreed with Plamper et al they found that there was statistically insignificant between two groups regarding Type 2 diabetes with p-value equal 0.114, while statistically significant was discovered among two groups as regard Hypertension with p value <0.001[10].

Furthermore, in agreement with Mahdy et al. who found that there was statistically significant between SG group, OAGB group and SASI group as regard Diabetes mellitus and Hypertension with p value < 0.0001, and 0.01 respectively, while there was no statistically significant between studied groups as regard Hyperlipidemia with p value = 0.08.

Our research demonstrated a statistically significant distinction in primary outcomes for losing weight post-surgery among the examined groups, namely according to kilograms lost and a BMI reduction [11].

Consistent with our findings Mahdy et al. they reported that following the three procedures at six and twelve months, a significant decrease was discovered within body mass index and weight

compared to baseline values. Body mass index and body weight were markedly lower after Single Anastomosis Sleeve Ileal bypass compared to following sleeve gastrectomy and one anastomosis gastric bypass at six months following surgery ($p = 0.01$ & 0.04). also, body weight and Body mass index were significantly lower following Single Anastomosis Sleeve Ileal bypass compared to following sleeve gastrectomy and one anastomosis gastric bypass at twelve months following surgery ($p < 0.0001$) [11].

Additionally, in agreement with the objective of Jamal et al. was to assess the impact of one anastomosis gastric bypass on cases' body mass index and obesity-correlated comorbidities, in addition to its safety as a revisional operation following sleeve failure. They reported that the mean weight prior to the 1ry bariatric operation (SG) was 117 ± 23.6 kilogram (80–180 kilogram). and the cases achieved at least mean weight of 87 ± 22.4 kilogram (54–166 kilograms) in a mean of 21 ± 13.9 months (three to sixty months, median twelve) following surgery. Weight regains was the reason for the revision operation. Among the 1ry and revision bariatric surgeries, the mean weight of the patients elevated between 87 kilograms to 112 ± 24.6 kilograms (77–186 kilograms) over a mean of 82 ± 30.7 months (24–139 months, median 90.3). The mean body mass index prior to one anastomosis gastric bypass was 42 ± 7.9 kilogram per square meter (30–60). Following a mean period of 19 ± 9.2 months (2.5–40.7 months, median 18.1), the lowest mean body mass index and weight they have achieved following OAGB as a revision operation are 85 ± 21.3 kilogram (57–145 kilograms) and 31.2 ± 6.1 kilogram per square meter (22.2–46.8 kilogram per square meter), respectively [12].

Our research indicated in accordance with the distribution of clinical data post-surgery among the examined groups, revealing statistically insignificant variations in HbA1c, glucose, diastolic blood pressure, systolic blood pressure, as well as triglycerides. However, a statistically significant variation according to the decrease has been observed in the number of medications, total cholesterol, LDL cholesterol, and HDL cholesterol among the groups examined.

Consistent with our findings Mahdy et al. revealed that at 12 months postoperatively the 3 procedures have been correlated with similar development within hypertension with p-value = 0.35, and hyperlipidemia with p-value equal 0.6, while statistically significant was discovered among studied groups as regard Type 2 diabetes mellitus with p value = 0.04 [11].

Also, agreed with Jamal et al. they found that Out of the fifty-six cases, nineteen had hypertension managed by drugs prior to one anastomosis gastric bypass. Eight (forty-two percent), however, had their blood pressure completely normalized following one anastomosis gastric bypass and no longer required any antihypertensive drugs. The remaining eleven (fifty-eight percent) had a reduction in their drugs consumption one pill versus two before) and showed controlled blood pressure readings during clinic visits. 5 of the sixty-six cases had T2DM prior to OAGB. Two of these patients (forty percent) had discontinued the requirement to take diabetes drugs due to a normal hemoglobin A1C of less than 6.5 during clinic visits. The remaining three patients (sixty percent) had reduced the number of oral hypoglycemic agents to one from two previously [12].

5. Conclusion

Our research found an insignificant distinction among OAGB and SG post-surgery according to systolic blood pressure, HbA1c, diastolic blood pressure glucose, and triglycerides. OAGB and SG are both effective surgical procedures for the treatment of obesity. OAGB demonstrated better results relative to SG in accordance with body mass index and loss of weight decrease.

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