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# Comparison between Sleeve Gastrectomy and One-Anastomosis Gastric Bypass in Terms of Weight Loss in Morbidly Obese Patients

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## ARTICLE INFO

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## ABSTRACT

**Background:** Morbid obesity presents a significant public health concern, necessitating effective surgical interventions for sustained weight loss. One-anastomosis gastric bypass and sleeve gastrectomy are commonly performed bariatric procedures, yet their comparative short-term outcomes continue to be investigated. This study aimed to evaluate and compare postoperative weight loss in patients undergoing OAGB versus SG. **Objective:** To compare sleeve gastrectomy with one-anastomosis gastric bypass in terms of weight loss in patients with morbid obesity. **Study Design:** Prospective Cohort Study. **Duration and Place of Study:** This study was conducted from May 2024 to January 2025 in the Department of Surgery, Khyber Teaching Hospital, Peshawar. **Methodology:** A total of 146 patients aged 30–50 years with BMI >35 kg/m$^2$ were enrolled and allocated into two equal groups (OAGB and SG, n=73 each) through non-probability consecutive sampling. Patients with comorbidities or medication use that could confound weight loss were excluded. All procedures were performed by experienced surgeons, and patients were followed for six months. Postoperative BMI and weight were measured, and total weight loss (TWL) was analyzed. **Results:** The mean age and preoperative BMI were similar between groups. At six months, the OAGB group had significantly lower BMI (35.75±2.71 kg/m$^2$) compared to the SG group (36.93±2.86 kg/m$^2$; p=0.012). BMI reduction was more pronounced in males, patients aged >40 years, and rural residents undergoing OAGB. **Conclusion:** OAGB is more effective than SG in achieving short-term BMI reduction in morbidly obese patients, particularly among older and male populations, indicating its potential as a preferred surgical option in selected cases.

## INTRODUCTION

Morbid obesity is a BMI of ≥40 or ≥35 with co-morbidities, such as type 2 diabetes, high blood pressure, sleep apnea, or osteoarthritis.[1] This state of severely extreme obesity is associated with vastly increased risks of heart disease, metabolic syndrome, non-alcoholic liver disease, and premature death.[2] The pathophysiology is a multi-faceted interaction of genes, environment, hormone, and behaviors that lead to chronic excess energy.[3] Standard lifestyle measures are, in themselves, typically inadequate for substantial weight loss in this group, and surgical options emerge as a candidate as part of a multidisciplinary management paradigm.[4]

Weight loss strategies in obese people encompass behaviorally directed therapy, change in diet, pharmacologic care, and surgery.[5] Although medication therapy achieves moderate weight loss (average of 5–10% of initial body weight), long-term follow-through is unsuccessful for high percentages of severely obese people.[6] Bariatric surgery is identified as superior long-term care for important and long-standing weight loss, with independent benefit in metabolic control and reduction in prevalence of cardiac risk factors.[7] Such patient referrals for surgery necessitate definitive evaluation of medical, psychologic, and nutrition status, plus certification they are qualified for participation and capable of complying with lifelong follow-through care.[7]

Sleeve gastrectomy is a type of restrictive bariatric surgery in which resection of approximately 75–80% of stomach is done by preserving a tubular gastric remnant on lesser curvature.[8] It induces early satiety and reduced caloric intake. It is also later accompanied by gut hormone secretion modification, a decrease in ghrelin secretion, which contributes towards appetite inhibition.[9] Weight loss result of sleeve gastrectomy tends to have an excess weight loss (EWL) of 50–70% in 1–2 years after surgery.[10] Sleeve gastrectomy is less strenuous when taken into account when it is compared with bypass procedures, intestinal tract continuity is preserved, but late weight

regain occurs and gastroesophageal reflux disease (GERD) generation or recurrence is seen.[11]

One-anastomosis gastric bypass (OAGB), or mini-gastric bypass, is a procedure that integrates both malabsorptive as well as restrictive mechanisms by creating a long, thin gastric pouch with anastomosis of it to a limb of jejunum, typically 150–200 cm from the ligament of Treitz[12]. It is a reduced version of the standard Roux-en-Y bypass, as it reduces anastomoses to a minimum, therefore reducingoperative time as well as complications.[13] OAGB has exhibited equal or superior weight loss with sleeve gastrectomy, attaining a common goal of a 60–80% EWL in a large number of cases, and is observed to have significant improvement or complete regression of obesity-related comorbidities.[14] It does, however, have issues with bile reflux as well as long-term deficiency of nutrients, therefore necessitating strict follow-through on the patient as well as supplementation protocol adherence.[15]

A separate investigation revealed that individuals who received one-anastomosis gastric bypass (OAGB) achieved a notably lower BMI than those treated with sleeve gastrectomy (SG), with mean values of 31.3 ± 8.3 and 34.5 ± 6.9 kg/m$^2$, respectively ($p = 0.002$).[16] Additionally, their percentage of total weight loss was significantly higher (25.1% ± 17.6 vs. 18.8% ± 14.1; $p = 0.003$). In another comparative analysis, the OAGB cohort demonstrated superior total weight loss (36.5% ± 6.8) relative to the SG group (33.2% ± 7.4; $p < 0.001$), alongside elevated weight-adjusted BMI values (20.1 ± 4.2 vs. 18.1 ± 4.3 kg/m$^2$; $p < 0.001$).[17]

Prevalence of morbid obesity is on a continuous rise in Peshawar, and there is a lack of region-specific data for informed decisions on the best bariatric procedures. With differences in anatomy, eating behaviors, and genetic tendencies in this category, there is a great need for a comparison of weight loss results between sleeve gastrectomy (SG) and one-anastomosis gastric bypass (OAGB). The focus of our research is creating evidence-based data relevant for Peshawar people, thus facilitating improved clinical decision-making in bariatric surgery.

## METHODOLOGY

This prospective cohort study was conducted over a duration of eight months, from May 2024 to January 2025, in the Department of Surgery at Khyber Teaching Hospital, Peshawar, following formal approval by the ethical and research review board. A total of 146 patients with morbid obesity were enrolled, with 73 individuals allocated to the sleeve gastrectomy group and 73 to the one-anastomosis gastric bypass group. The sample size was determined using a 95% confidence interval and 80% power, based on mean postoperative weight reduction values of 36.5 ± 6.8 kg for the gastric bypass group and 33.2 ± 7.4 kg for the sleeve gastrectomy group.

Patients were recruited through non-probability consecutive sampling. Individuals aged 30 to 50 years of either sex, who met the diagnostic threshold for morbid obesity, were considered for inclusion. Morbid obesity was defined as a body mass index (BMI), calculated by dividing body weight in kilograms by the square of height in meters, exceeding 35 kg/m$^2$. Exclusion criteria included patients diagnosed with diabetes mellitus, liver cirrhosis as documented in medical records, chronic kidney disease defined by an estimated glomerular filtration rate below 60 ml/min/1.73 m$^2$, a history of systemic steroid use in the preceding six months, or any major psychiatric condition reported within the past six months. These exclusions were implemented to reduce potential sources of bias and control for confounding factors.

After confirmation of eligibility, patients were informed of the study's objectives, the procedural steps of each surgery, and their rights as participants. Written informed consent was obtained from all individuals. Each patient underwent a thorough preoperative assessment conducted by a multidisciplinary team that included a dietician, endocrinologist, anesthetist, and psychiatrist. Based on the surgical intervention planned, patients were divided into two cohorts: one receiving sleeve gastrectomy and the other undergoing one-anastomosis gastric bypass. All procedures were performed by a consultant general surgeon with no less than five years of experience in bariatric surgery. Postoperative care adhered to a standardized protocol and included dietary counselling by a certified dietician, guidance on physical activity, and regular follow-up instructions.

Each subject was followed for a duration of six months to evaluate weight reduction. Weight loss was assessed using total weight loss (TWL), which was calculated as the difference in body weight before surgery and at six months postoperatively, expressed as a percentage of the initial weight. A postoperative BMI less than 35 kg/m$^2$ at the end of six months was considered a favorable outcome. Additional data including age, sex, baseline BMI, residential background, level of education, and socioeconomic indicators were recorded using a structured data collection form.

Data were analyzed using IBM SPSS Statistics version 20. Normality of continuous variables was evaluated using the Shapiro-Wilk test. Quantitative data were summarized using mean ± standard deviation or median with interquartile range, as appropriate. Categorical variables were presented as frequencies and percentages. Comparison of weight loss outcomes between the two groups was performed using an independent t-test or the Mann-Whitney U test at a significance level of 0.05.

## RESULTS

In this comparative analysis between one-anastomosis gastric bypass (OAGB) and sleeve gastrectomy (SG) in 146 morbidly obese patients (73 per group), baseline age was comparable between OAGB (38.08±6.16 years) and SG (38.21±4.92 years). Preoperative weight and height were 103.30±14.36 kg and 1.69±0.06 m in OAGB versus 107.62±13.65 kg and 1.70±0.05 m in SG. At 6 months, weight reduced to 82.44±10.55 kg in OAGB and 85.77±8.89 kg in SG, indicating substantial postoperative weight loss in both groups (as shown in Table-I). Males predominated in both groups (OAGB: 87.7%, SG: 91.8%). Literacy was higher in the SG group (90.4%) compared to OAGB (71.2%), while illiteracy was more common in OAGB (28.8% vs. 9.6%). Socioeconomically, SG participants were more represented in the middle and rich categories, with no poor individuals (0%), while the OAGB group included

21.9% poor. Urban residence was more frequent in SG (95.9%) versus OAGB (64.4%).

**Table I**

*Demographics and Characteristics in both Group (n=146)*

| Variable | One-anastomosis gastric bypass group (n=73) | Sleeve Gastrectomy group (n=73) |
|---|---|---|
| Age (years) | 38.08±6.16 | 38.21±4.92 |
| Height (m) | 1.69±0.06 | 1.70±0.05 |
| Weight (kg) | 103.30±14.36 | 107.62±13.65 |
| After 6 months Height (m) | 1.69±0.06 | 1.70±0.05 |
| After 6 months Weight (kg) | 82.44±10.55 | 85.77±8.89 |
| **Gender** | | |
| Male | 64 (87.7%) | 67 (91.8%) |
| Female | 9 (12.3%) | 6 (8.2%) |
| **Education Status** | | |
| Literate | 52 (71.2%) | 66 (90.4%) |
| Illiterate | 21 (28.8%) | 7 (9.6%) |
| **Socioeconomic Status** | | |
| Poor | 16 (21.9%) | 0 (0.0%) |
| Middle | 40 (54.8%) | 51 (69.9%) |
| Rich | 17 (23.3%) | 22 (30.1%) |
| **Residence** | | |
| Urban | 47 (64.4%) | 70 (95.9%) |
| Rural | 26 (35.6%) | 3 (4.1%) |

Six months post-surgery, mean BMI was significantly lower in the OAGB group (35.75±2.71 kg/m$^2$) compared to the SG group (36.93±2.86 kg/m$^2$), with a statistically significant difference (p=0.012) (as shown in Table-II)

**Table II**

*Comparison of Mean BMI after 6 months in Both Groups*

| Parameter | One-anastomosis gastric bypass group (A) (n=73) | Sleeve Gastrectomy group (B) (n=73) | t | p-value |
|---|---|---|---|---|
| BMI (kg/m$^2$) | 35.75 ± 2.71 | 36.93 ± 2.86 | -2.555 | 0.012 |

Among patients aged ≤40 years, the mean BMI was 33.51 ± 2.23 kg/m$^2$ in the OAGB group (n=22) and 34.67 ± 2.50 kg/m$^2$ in the SG group (n=21), with no statistically significant difference (p=0.116). However, for patients aged >40 years, the OAGB group (n=51) had a significantly lower mean BMI of 36.72 ± 2.30 kg/m$^2$ compared to 37.84 ± 2.48 kg/m$^2$ in the SG group (n=52), with a p-value of 0.019, indicating statistical significance.

When stratified by gender, males in the OAGB group (n=64) had a mean BMI of 36.13 ± 2.51 kg/m$^2$, significantly lower than the 37.11 ± 2.85 kg/m$^2$ observed in the SG group (n=67), with a p-value of 0.037. Among females, the OAGB group (n=9) had a mean BMI of 33.07 ± 2.70 kg/m$^2$, compared to 34.87 ± 2.29 kg/m$^2$ in the SG group (n=6), but this difference was not statistically significant (p=0.19).

Regarding education status, literate individuals in the OAGB group (n=52) had a mean BMI of 36.93 ± 2.20 kg/m$^2$, slightly lower than the SG group (n=66), which had a mean BMI of 37.37 ± 2.65 kg/m$^2$, but this difference was not statistically significant (p=0.332). Among illiterate participants, both groups showed identical mean BMIs of 32.83, though the standard deviation differed (OAGB: ±1.25, SG: ±0.59), and the p-value was 0.999, confirming no significant difference.

In terms of residence, urban patients in the OAGB group (n=47) had a mean BMI of 37.04 ± 2.28 kg/m$^2$, closely comparable to the SG group (n=70) at 37.13 ± 2.74 kg/m$^2$, with no statistical difference (p=0.846). However, for rural residents, the OAGB group (n=26) had a higher mean BMI of 33.42 ± 1.66 kg/m$^2$ compared to 32.20 ± 0.00 kg/m$^2$ in the SG group (n=3), a difference that reached statistical significance (p=0.002) (as shown in Table-III and Graph-I)

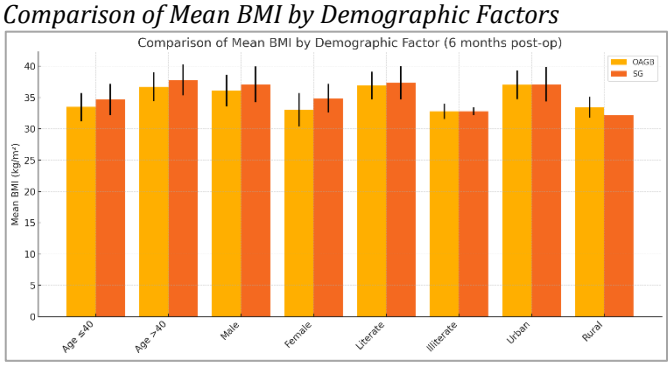
**Table III**

*Stratification of Mean BMI with Respect to Demographic Factors in Both Groups*

| Demographic Factors | Group | Mean BMI (kg/m$^2$) | SD | p-value |
|---|---|---|---|---|
| **Age (years)** | **≤40** | | | 0.116 |
| | A (n = 22) | 33.51 | 2.23 | |
| | B (n = 21) | 34.67 | 2.5 | |
| | **>40** | | | 0.019 |
| | A (n = 51) | 36.72 | 2.3 | |
| | B (n = 52) | 37.84 | 2.48 | |
| **Gender** | **Male** | | | 0.037 |
| | A (n = 64) | 36.13 | 2.51 | |
| | B (n = 67) | 37.11 | 2.85 | |
| | **Female** | | | 0.19 |
| | A (n = 9) | 33.07 | 2.7 | |
| | B (n = 6) | 34.87 | 2.29 | |
| **Education Status** | **Literate** | | | 0.332 |
| | A (n = 52) | 36.93 | 2.2 | |
| | B (n = 66) | 37.37 | 2.65 | |
| | **Illiterate** | | | 0.999 |
| | A (n = 21) | 32.83 | 1.25 | |
| | B (n = 7) | 32.83 | 0.59 | |
| **Residence** | **Urban** | | | 0.846 |
| | A (n = 47) | 37.04 | 2.28 | |
| | B (n = 70) | 37.13 | 2.74 | |
| | **Rural** | | | 0.002 |
| | A (n = 26) | 33.42 | 1.66 | |
| | B (n = 3) | 32.2 | 0 | |

**Graph I**

*Comparison of Mean BMI by Demographic Factors*




## DISCUSSION

The results demonstrated a statistically significant greater reduction in BMI in the OAGB group compared to the SG group, particularly among older patients (>40 years), males, and rural residents. This difference may be attributed to the more pronounced malabsorptive component of OAGB, which enhances weight loss by bypassing a segment of the small intestine, thereby reducing nutrient absorption. In contrast, SG primarily relies on gastric volume restriction, which may result in relatively less metabolic impact. The greater effect observed in males could be related to sex-based differences in visceral fat metabolism and hormonal response to bariatric surgery. Additionally, the pronounced effect in older individuals may reflect a higher

baseline BMI or altered gut hormone profiles that respond more favorably to the anatomical changes induced by OAGB. The unexpected finding of higher BMI in rural OAGB patients compared to SG may suggest sociocultural or dietary patterns that influence postoperative outcomes, highlighting the multifactorial nature of weight loss trajectories.

Our study results demonstrated significant postoperative weight loss in both OAGB and SG groups over a six-month period, with a more pronounced BMI reduction in the OAGB group ($35.75 \pm 2.71$ kg/m$^2$) compared to SG ($36.93 \pm 2.86$ kg/m$^2$, $p=0.012$). These findings align closely with those of Plamper et al. [18], who reported long-term superiority in BMI reduction and comorbidity resolution with OAGB. Similarly, Magouliotis et al. [19], in their meta-analysis of 6761 patients, confirmed significantly greater %EWL and shorter hospital stay favoring OAGB. Elfeky et al. [20] also reported superior %EWL and lower BMI in OAGB at 12 months, reinforcing the early and sustained weight loss benefits of OAGB. These consistent observations across studies support the dual mechanism of OAGB—restrictive and malabsorptive—as a key contributor to superior weight loss outcomes when compared to SG, which functions solely via gastric restriction.

Our study further observed significant BMI differences in stratified analyses. In patients aged >40 years and in males, OAGB resulted in significantly lower BMIs than SG ($p=0.019$ and $p=0.037$, respectively), which may be attributed to age- and sex-related metabolic variations that respond better to the malabsorptive component of OAGB. Similar age-dependent trends were reported by Elfeky et al. [20], who found better postoperative BMI and %EWL in patients with higher baseline BMI, many of whom were older. Mujahid et al. [21] also observed stronger improvements in metabolic parameters in OAGB, including HbA1c and lipid profiles, reinforcing the procedure's utility in patients with more entrenched metabolic dysfunction, often associated with increasing age.

In gender-specific analysis, our findings parallel the general trend noted in Das et al. [22], where although gender-stratified BMI was not specifically presented, male-predominant OAGB cases still reflected favorable outcomes. The male-dominant distribution in both groups in our study (OAGB: 87.7%, SG: 91.8%) suggests that male patients might benefit more from the combined metabolic mechanisms of OAGB, consistent with known gender-related differences in visceral fat metabolism and hormonal response to bariatric interventions.

Educational and socioeconomic stratification in our cohort showed no significant BMI differences between literate and illiterate groups, a finding not previously elaborated in detail by other studies. However, the higher representation of literate and urban patients in the SG group reflects potential access-related biases, which may influence nutritional compliance or follow-up patterns rather than physiological outcomes. Interestingly, our study found that among rural patients, those undergoing SG had significantly lower BMI than OAGB counterparts, diverging from most previous reports. This could be explained by differing postoperative support, dietary habits, or socio-cultural factors affecting adherence in rural populations, which may attenuate the metabolic advantage of OAGB.

In terms of safety and complications, our six-month dataset did not include specific morbidity profiles; however, comparable studies such as those by Plamper et al. [18] and Elfeky et al. [20] highlighted the higher risk of nutritional deficiencies and ulceration with OAGB, especially long-term. Plamper et al. [18] reported significantly higher rates of nutritional deficiency in OAGB, and Elfeky et al. [20] observed increased hypoalbuminemia, ferritin, and vitamin D deficiencies. These reinforce the importance of rigorous nutritional surveillance in OAGB patients, a limitation that should be addressed in extended follow-up of our cohort.

To conclude the discussion, the cumulative findings of this study, supported by existing literature, reinforce the clinical value of OAGB as an effective bariatric procedure with superior short-term BMI reduction compared to SG, particularly in older and male patients. However, given the variability in outcomes across demographic subgroups, including unexpected trends in rural populations, individualized patient selection and comprehensive perioperative planning remain essential to optimize surgical results and long-term success.

This study has a few acknowledged limitations. Being carried out at a single institution, the results may not be fully representative of wider or more heterogeneous populations, thus potentially affecting the applicability of the findings in different clinical or demographic settings. The relatively short follow-up period of six months precludes assessment of long-term weight maintenance, nutritional complications, and resolution of comorbidities. Additionally, while key anthropometric and demographic factors were analyzed, detailed metabolic and nutritional outcomes, as well as quality-of-life metrics, were not included and warrant investigation in future prospective multicenter studies.

## CONCLUSION

Our findings indicate that one-anastomosis gastric bypass demonstrates greater short-term effectiveness than sleeve gastrectomy in reducing BMI among individuals with morbid obesity. The superiority of OAGB was particularly evident in older and male subgroups, suggesting potential demographic influences on surgical outcomes. These findings support the preferential consideration of OAGB in selected patients; however, long-term follow-up and broader population studies are needed to validate its sustained benefits and safety profile.

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