

Comparative Study Between Young And Old Age Above 60 After Sleeve Gastrectomy

General Surgery

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ABSTRACT

Background: Obesity is a worldwide health issue with serious medical, psychological, social, and economic consequences.

Aim of the work: The goal of this study was to assess the effectiveness and safety after sleeve gastrectomy among age group more than 60 years and age group below 60 years.

Patients and methods: A randomized prospective clinical study which conducted from January 2020 to December 2021. The participants were 100 in number categorized into two groups each of them 50 according to age. Group 1 (Elderly) \geq 60 years, and group 2 (Younger) $<$ 60 years. Intraoperative time, hospital stay, post sleeve weight loss, comorbidity changes, complications in the form of leakage, bleeding and death will be recorded.

Results: There were no complications among 94% and 96%, there were bleeding among 4% and 4% and there was leakage among 2% and 0% among elderly and young groups respectively. A significant change was found among the study groups as regard EWL after 48 weeks post-operative.

Conclusion: Sleeve gastrectomy is a very safe procedure with similar risks and adverse effect rates as when it comes to treating obesity in younger adults.

Keywords: Bariatric surgery; Sleeve gastrectomy; Elderly.

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INTRODUCTION

Obesity is a worldwide health issue with major medical, psychological, social, and economic implications. In Arab nations, obesity is regarded as a pan-endemic concern. The body mass index (BMI) is a basic weight-for-height index that is often used to categorize humans as underweight, overweight, or obese. It's computed by dividing the weight in kilograms by the square of the height in meter (kg/m²). According to the WHO, overweight is defined as having a BMI of 25, while obesity is defined as having a BMI of 30. ¹

Age is a main factor impacting the rates of death and morbidity post sleeve gastrectomy. The utilization of a laparoscopic operation in elderly cases can result in complications as comorbid conditions are very frequent with age-related advances and might increase the risk of post-operative complications. ²

Ageing patients are more expected to develop obesity-associated comorbidities, as with age comes a decline in physiologic assets and obesity more emphasizes this hazard. Actually, the frequency of both DM and HTN surges in older patients as their BMI rises. Advanced age and obesity are taken into consideration as the highest correlated factors for non-controlled arterial HTN. ³

The use of sleeve gastrectomy in older adults was primarily restricted due to a more significant risk: the lack of evidence of long-term influence of sleeve

gastrectomy on weight control, remission, comorbidity advancements, and nutrition level, in addition to the potentially harmful effects of massive weight loss on muscles and bones. ⁴

However, the use of bariatric surgery in cases $>$ 60 yrs. has increased lately, with 10% of cases undergoing bariatric operations in the USA. ⁵ This rise coincides with the known safety of bariatric operations because of the combination of laparoscopy and developments in pre-operative management as well as the above-mentioned exponential rise in obesity in this cohort, which, in the upcoming years, may cause an increased number of older cases demanding bariatric surgery. ⁶

The aim of the current work was to assess effectiveness and safety after sleeve gastrectomy among age group more than 60 years and age group below 60 years.

PATIENTS AND METHODS

A randomized prospective clinical study which conducted from January 2020 to December 2021. After approval of the Ethical Committee of faculty of medicine Al Azhar university, an informed written agreement was attained from all cases comprised in the research. The participants have been allocated into 2 groups according to age. Group 1(50 participant) (Elderly) \geq 60 years, and group 2(50

participant) (Younger) < 60 years.

Study subjects:

Inclusion criteria:

Age from 21-70 yrs., both sexes with history of unsuccessful weight loss attempts in the past and good motivations for operation and patients with a BMI 40kg/m² or more.

Exclusion criteria:

Previous bariatric surgery, previous gastric surgery, females during pregnancy and high-risk patient for operation

Sample Size Calculation:

At 80% power and a level of significance at p value equal 0.05, it was found that 50 cases were needed in every group. The sample size was determined to get adequate statistical power for multi-comparisons.

Study tools:

All cases were exposed for thorough history and medical examinations, obesity-associated comorbidities, reasons of obesity, weight/BMI, and exclusions connected to operative risks.

Perioperative management: Preoperative anticoagulant were administered to the patients 12 hours before the procedure, then continue for two weeks after the surgery. Prophylactic antibiotic (cefotaxime 2 gm.) was given immediately before the surgery, then continue for three days after the surgery. Also, analgesics (NSAIDS) will be administered according to body weight post-operatively.

Intraoperative data: including blood loss, mean operative time. Post-operative hospitalization ranged from 1 to 2 days. Patients remain on a low-sugar clear liquid meal program for 7 days, then 7 days turbid fluids, 7 days suttee and puree food, 7 days meat and chunks then retain to normal dietary habits.

Outcomes: Weight loss by determining the percent of extra weight losing (% EWL) or the percent of extra BMI decrease. Comorbidities variations will be assessed either resolution or improvement. Complications in the form of leakage, bleeding, and death. Follow-up occurs at approximate intervals of 2, 4, 12, 24, 36, and then 72 weeks. The follow up parameters will be submitted for weight, BMI, expected weight loss (EWL).

Post-operative maintenance: Inhibition and treatments of nutritional sleeve gastrectomy complications were performed by the application of every day multi-vitamins and minerals. Ingesting 35 g/day of protein is suggested.

Statistical analysis:

The collected data were statistically analyzed via SPSS-26 (IBM, USA). Normally distributed data was tested via Shapiro Walk testing. Qualitative data has been introduced as frequency and percent. Chi square testing (χ^2) has been utilized to determine change among qualitative variables. Quantitative data has been introduced as mean and SD. Paired t test used for comparing between pre and post operative quantitative data of the same group. Student t test was utilized to analyze variance between quantitative variables in the 3 groups for parametric and non-parametric variables. Results were considered significant at P-value < 0.05.

RESULTS

The participants have been allocated into 2 groups. Group elderly aged ≥ 60 years while group younger aged from 21 to 60 years.

In table 1 the mean age is 62.4 ± 2 and 35.1 ± 10.5 among elderly and younger groups. There were 44% males and 56% females among elderly group while among the younger group there were 36% males and 64% females. There were 10% and 16% were smokers among elderly and younger groups respectively. According to co morbidities there were 30% and 12% had diabetes mellitus among elderly and young groups. A significant change was found among groups as regard age and comorbidities but a nonsignificant change was found regarding other variables.

| Items | Elderly ≥ 60 years n= 50 | Younger < 60 n= 50 | P value |
|----------------------|-------------------------------------|--------------------------|---------|
| Age (years) | | | |
| Mean \pm SD | 62.4 \pm 2 | 35.1 \pm 10.5 | <0.001* |
| Gender | | | |
| Male n (%) | 22 (44) | 18 (36) | 0.509 |
| Female n (%) | 28 (56) | 32 (64) | |
| Smokers n (%) | 5 (10) | 8 (16) | 0.118 |

| Comorbidities | | | |
|-------------------------------|---------|--------|---------------------|
| Diabetes mellitus n (%) | 15 (30) | 6(12) | 0.008* ² |
| Hypertension n (%) | 18 (36) | 9 (18) | |
| Hyperlipidemia n (%) | 12 (24) | 8 (16) | |
| Cardiovascular diseases n (%) | 9 (18) | 7 (14) | |
| Renal diseases n (%) | 8 (16) | 2 (4) | |

Table 1: Sociodemographic data among the two studied groups.

1 Student t test

2 Chi square testing

* significance at $p < 0.05$

According to table 2 the mean weight 119.0 ± 12.5 and 124.9 ± 24.8 among ageing and young groups resp. The mean height was 161.8 ± 5.9 and 160.4 ± 9.2 cm among ageing and young groups resp. While the mean BMI was 45.8 ± 4.3 and 48.6 ± 9.7 among elderly and young groups respectively. The mean cholesterol level was 220.5 ± 22.2 and 221.1 ± 23.3 among ageing and young groups resp. The mean triglyceride was 186.1 ± 16.3 and 183.3 ± 21.0 among ageing and young groups resp. A nonsignificant change was found among groups as regard preoperative data.

| Diagnosis | Elderly group Mean \pm SD | Younger group Mean \pm SD | P value |
|--------------|--------------------------------|--------------------------------|---------|
| Weight/kg | 119.0 ± 12.5 | 124.9 ± 24.8 | 0.101 |
| Height /cm | 161.8 ± 5.9 | 160.4 ± 9.2 | 0.566 |
| BMI | 45.8 ± 4.3 | 48.6 ± 9.7 | 0.082 |
| Cholesterol | 220.5 ± 22.2 | 221.1 ± 23.3 | 0.990 |
| Triglyceride | 186.1 ± 16.3 | 183.3 ± 21.0 | 0.613 |

Table 2: Preoperative anthropometric measures among the two studied groups.

Student t test; Mann Whitney U test

*P is significant at < 0.05

The mean time of surgery was 60.5 ± 17.6 and 50.3 ± 19.4 minutes among elderly and young groups respectively. The duration of staying at hospital was one day among 80% and 90%, two days among 20% and 10% among elderly and young groups respectively. A significant change was found among the study groups as regard Intraoperative data

| Variables | Elderly | Younger | P value |
|----------------------------------|-----------------|-----------------|-------------|
| Time of surgery Mean \pm SD | 60.5 ± 17.6 | 50.3 ± 19.4 | $> 0.007^*$ |
| Hospital stay One day | 40 (80%) | 45 (90%) | 0.04* |
| Two days | 10 (20%) | 5 (10%) | |

Table 3: Intraoperative data of the two studied groups.

1 Mann Whitney U test

2 Fisher Exact test

*P is significant at < 0.05

There were no complications among 94% and 96%, there were bleeding among 8%, and there was leakage among 2% and 0% among elderly and young groups resp. A nonsignificant change was found among the study groups as regard post-operative complications as shown in table 4.

| Complications | Elderly | Younger | P value |
|---------------|---------|---------|---------|
| No | 47(94%) | 48 (96) | 0.364 |
| Bleeding | 2 (4%) | 2 (4%) | |
| Leakage | 1 (2%) | - | |

Table 4: Post-operative complications among the study groups.

A significant change was found among the study groups as regard weight after 48 weeks post-operative, BMI after 48 weeks post-operative, and EWL after 48 weeks post-operative. A nonsignificant change was found among the study groups as regard weight, BMI, EWL post-operative at 4, 12, 24, and 36 weeks post-operatively, cholesterol and triglycerides as shown in table 5 and figure 1.

| Variables | Elderly | Younger | P value |
|-----------------------------|-------------|-------------|---------------|
| Weight after 4 weeks | 119.6± 14.2 | 117.8± 12.9 | 0.805 |
| Weight after 12 weeks | 105.0± 10.2 | 107.0± 9.3 | 0.552 |
| Weight after 24 weeks | 103.6± 11.7 | 100.1± 13.5 | 0.691 |
| Weight after 36 weeks | 86.1± 9.1 | 85.0± 8.9 | 0.574 |
| Weight after 48 weeks | 69.5± 7.9 | 60.6± 6.2 | 0.005* |
| BMI after 4 weeks | 47.5± 1.2 | 47.4± 1.1 | 0.248 |
| BMI after 12 weeks | 47.2± 0.8 | 46.9± 0.7 | 0.964 |
| BMI after 24 weeks | 45.6± 1.2 | 45.5± 1.1 | 0.434 |
| BMI after 36 weeks | 38.1± 0.9 | 37.9± 0.9 | 0.248 |
| BMI after 48 weeks | 27.5± 1 | 24.8± 3.6 | 0.003* |
| EWL after 4 weeks (%) | 16.0± 1.3 | 16.1± 1.5 | 0.899 |
| EWL after 12 weeks (%) | 21.0± 1.6 | 20.8± 1.6 | 0.813 |
| EWL after 24weeks (%) | 28.1± 3.3 | 28.2± 3.4 | 0.078 |
| EWL after 36 weeks (%) | 47.1± 4.6 | 48.2± 4.5 | 0.762 |
| EWL after 48 weeks (%) | 70.5± 12.3 | 82.9± 7.6 | 0.002* |
| Cholesterol after 48 weeks | 162.5± 16.6 | 158.1± 14.7 | 0.378 |
| Triglyceride after 48 weeks | 142± 15.5 | 136± 16.9 | 0.510 |

Table 5: post-operative outcomes among the two studied groups.

1 Chi square test

2 Mann Whitney U test

*P is significant at <0.05

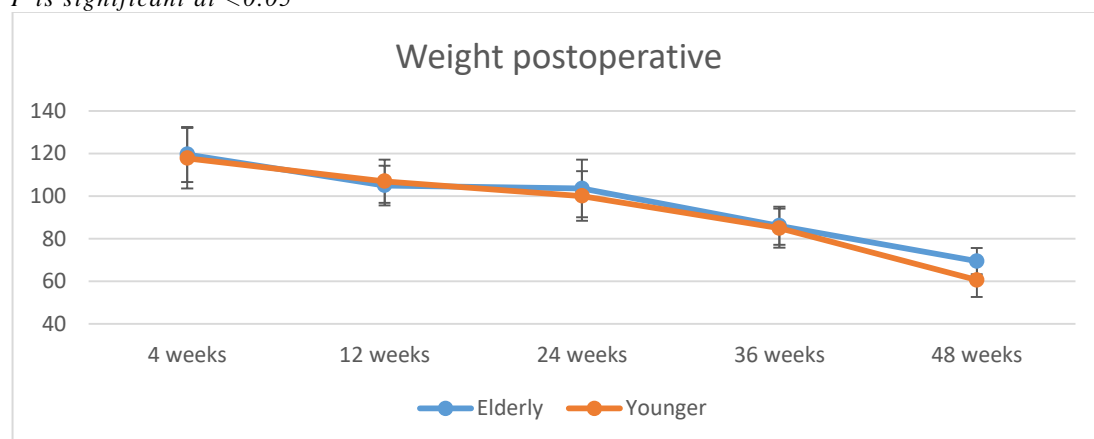


Fig. 1: Weight post operative among elderly and younger groups.

DISCUSSION

Over the last few decades, the idea of frailty has been progressively known as a characteristic health state connected to the aging advance. It is a multi-dimensional condition involving losses of energy, physical capability, cognition and health and signifies the general consequence of reduced physiological assets across several organs. The decline of the physiological assets is a result of aging and the accompanying morbidities.⁷

About 10% of cases aged ≥ 65 yrs. presenting with frailty and this rate increases up to 50% in those aged ≥ 85 yrs. The phenotype of frailty was reliably accompanying with elevated morbidities and mortalities in ageing operative cases a correlation which makes it a respected adjunct in the pre-operative evaluation.⁸

The prevalence of obesity in the old aged cases has elevated dramatically and is accompanying with an increased risk of cardio-vascular disorders, metabolic

disorders, different tumors and other comorbidities at these ages.⁹

Meanwhile age is accompanying with presence of several co-morbidities and decreased functional reserve, it is supposed that operating on ageing cases can be accompanying with an elevated rate of complications.^{10,11}

The growing prevalence of obesity in elderly cases shows the combinations of 2 of the key burdens to health-care systems at the present time.¹¹ In this work, we aimed to assess effectiveness and safety after sleeve gastrectomy among age group more than 60 years and age group below 60 years.

In the current work, A significant change was found among the study groups as regard weight after 48 weeks post-operative, BMI after 48 weeks post-operative, and EWL after 48 weeks post-operative.

Similar to our results, Dowgiallo-Wnukiewicz and his colleagues demonstrated that Younger cases tended to have more weight loss in comparison to elder cases at following-up.⁷

A meta-analysis revealed that younger cases had better weight losses in comparison to ageing cases.¹² Weight loss outcomes were significantly improved for younger cases throughout the 1st post-operative years, but no change persisted afterward.¹³

In the current study, there were no complications among 94% and 96%, there were bleeding among 8%, and there was leakage among 2% and 0% among elderly and young groups resp. A nonsignificant change was found among the study groups as regard post-operative complications.

In a study evaluated the clinical outcomes of sleeve gastrectomy in older central European cases. They compared the safety and efficiency of sleeve gastrectomy in cases >60 years versus younger cases. They revealed that the rate of complications was comparable for the 2 age groups.

A study by Mantziari enrolled of 820 cases, with a 10-years following-up of 80.6%. cases \geq 55 yrs. had comparable post-operative morbidities and mortalities as younger ones, in spite of significantly more co-morbidities at pre-operatively.¹³

In the current study, according to co morbidities there were 30% and 12% had diabetes mellitus among elderly and young groups. There is significant change among the study groups as regard age and comorbidities.

The national survey of health and nutrition (ENSANUT) in 2012 reported that 40 % of Mexican persons aged \geq 60 yrs. have HTN, while 24% and 20% have T2DM and hyper-lipedema, resp.¹⁴

De Leon revealed that in cases aged > 60 yrs., the frequency of arterial HPT, T2DM, and reduced GFR were 70 %, 45 %, and 16 %, resp., while for younger cases, these were 34 %, 27 %, and <1%, resp.¹⁵

According to our results, the mean time of surgery was 60.5 ± 17.6 and 50.3 ± 19.4 minutes among elderly and young groups respectively. The duration of staying at hospital was one day among 80% and

90%, two days among 20% and 10% among elderly and young groups resp. A significant change was found among the study groups as regard intraoperative data.

A study by Aryanne had found nonsignificant difference amid the older adult group and the controls in mean surgical time (65 ± 17 min versus 63 ± 22 min), and post-operative hospitalization (2.40 ± 0.80 days versus 2.40 ± 1.40 days). While post-operative complications and re-operations were infrequent in the two groups, with nonsignificant change. There was no death in both groups.¹⁶

In the current study, the mean weight 119.0 ± 12.5 and 124.9 ± 24.8 among ageing and young groups resp. The mean height was 161.8 ± 5.9 and 160.4 ± 9.2 cm among ageing and young groups resp. While the mean BMI was 45.8 ± 4.3 and 48.6 ± 9.7 among ageing and young groups resp. The mean cholesterol level was 220.5 ± 22.2 and 221.1 ± 23.3 among ageing and young groups resp. The mean triglyceride was 186.1 ± 16.3 and 183.3 ± 21.0 among ageing and young groups resp. A nonsignificant change was found among the study groups as regard preoperative data.

In a study by de Leon, there were 496 (58%) females and 353 (41%) males. The group of cases > 60-yrs included 57 (6.7%) cases, while 792 (93.3%) were < 60 years. Mean pre-intervention weight and fat free mass (FFM) were significantly lower in cases aged > 60-yrs.¹⁵

CONCLUSION

Sleeve gastrectomy is a safe treatment for obesity and its comorbidities in old aged cases, with comparable operative-risks and complications to those of younger cases.

REFERENCES

- 1- Thaher O, Wolf S, Hukauf M, Stroh C. Propensity Score–Matching Sleeve Gastrectomy (SG) vs. Gastric Bypass (RYGB) in Patients \geq 60 Years. *Obes Surg.* 2021;31(6):2682–90.
- 2- Cunha JB da, Fialho MCP, Arruda SL de M, Nobrega OT, Camargos EF. Bariatric surgery as a safe and effective intervention for the control of comorbidities in older adults. *Geriatr Gerontol Aging.* 2020;14(3):207–12.
- 3- Abouelela MS, Mourad FA, Reyad HA. Comparison between effectiveness of mini gastric bypass and sleeve gastrectomy in weight reduction in super obese patients. *Egypt J Surg.* 2020;39(2):338.
- 4- Elnahas AI, Doumouras AG, Anvari M, Schlachta CM, McClure A, Alkhamisi NA, et al. Access to bariatric surgery among older patients in a publicly funded regionalized care system. *Surg Endosc.* 2021;1–8.
- 5- Al-Kurd A, Grinbaum R, Mordechay-Heyn T, Asli S, Abubeih A, Mizrahi I, et al. Outcomes of sleeve gastrectomy in septuagenarians. *Obes Surg.* 2018;28(12):3895–901.

- 6- Giordano S, Salminen P. Laparoscopic sleeve gastrectomy is safe for patients over 60 years of age: a meta-analysis of comparative studies. *J Laparoendosc Adv Surg Tech.* 2020;30(1):12–9.
- 7- Dowgiallo-Wnukiewicz N, Janik MR, Lech P, Major P, Pędzwiatr M, Kowalewski PK, et al. Outcomes of sleeve gastrectomy in patients older than 60 years: a multicenter matched case-control study. *Videosurgery Other Miniinvasive Tech.* 2020;15(1):123.
- 8- Navarrete A, Corcelles R, Del Gobbo GD, Perez S, Vidal J, Lacy A. Sleeve gastrectomy in the elderly: A case-control study with long-term follow-up of 3 years. *Surg Obes Relat Dis.* 2017;13(4):575–80.
- 9- Xu C, Yan T, Liu H, Mao R, Peng Y, Liu Y. Comparative safety and effectiveness of Roux-en-Y gastric bypass and sleeve gastrectomy in obese elder patients: a systematic review and meta-analysis. *Obes Surg.* 2020;30(9):3408–16.
- 10- Parmar C, Mahawar KK, Carr WRJ, Schroeder N, Balupuri S, Small PK. Bariatric surgery in septuagenarians: a comparison with < 60 year olds. *Obes Surg.* 2017;27(12):3165–9.
- 11- Kaplan U, Penner S, Farrokhyar F, Andruszkiewicz N, Breau R, Gmora S, et al. Bariatric surgery in the elderly is associated with similar surgical risks and significant long-term health benefits. *Obes Surg.* 2018;28(8):2165–70.
- 12- Marczuk P, Kubisa MJ, Świąch M, Wałędzia M, Kowalewski P, Major P, et al. Effectiveness and safety of Roux-en-Y gastric bypass in elderly patients—systematic review and meta-analysis. *Obes Surg.* 2019;29(2):361–8.
- 13- Mantziari S, Dayer A, Duvoisin C, Demartines N, Allemann P, Calmes J-M, et al. Long-term weight loss, metabolic outcomes, and quality of life at 10 years after Roux-en-Y gastric bypass are independent of patients' age at baseline. *Obes Surg.* 2020;30(4):1181–8.
- 14- Manrique-Espinoza B, Salinas-Rodríguez A, Moreno-Tamayo KM, Acosta-Castillo I, Sosa-Ortiz AL, Gutiérrez-Robledo LM, et al. Health conditions and functional status of older adults in Mexico. *Salud Publica Mex.* 2013;55:S323–31.
- 15- de Leon-Ballesteros GP, Sánchez-Aguilar HA, Velázquez-Fernández D, Nava-Ponce T, Herrera MF. Roux-en-Y Gastric Bypass in Patients > 60 Years of Age: Morbidity and Short-Term Outcomes. *Obes Surg.* 2020;30(12):5033–40.
- 16- Aryaneshad S, Khalaj A, Hosseinpanah F, Mahdavi M, Valizadeh M, Barzin M. One-year outcomes of bariatric surgery in older adults: a case-matched analysis based on the Tehran Obesity Treatment Study. *Surg Today.* 2021;51(1):61–9.