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ORIGINAL ARTICLE

Comparing the Effect of Single Anastomosis Sleeve-Jejunal Bypass and Sleeve Gastrectomy on Weight Loss and Metabolic Comorbidities among Patients with Morbid Obesity

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ABSTRACT

Background: The rise in morbid obesity has prompted the development of new bariatric surgery techniques, including the Single Anastomosis Sleeve Jejunal Bypass (SASJ). This study aimed to compare the effects of SASJ and conventional Sleeve Gastrectomy (SG) on weight loss, biochemical markers, and comorbidities and to provide essential insights for tailored interventions.

Methods: In a multicenteric observational-analytical retrospective cohort study from January 2019 to January 2024 at Faghihi, Mother and Child and Abou Ali Sina hospitals in Shiraz, Southern Iran; 61 patients (32 underwent SASJ and 29 underwent SG) were enrolled to assess weight, anthropometric indices, lipid profile and metabolic outcome.

Results: Both SASJ and SG groups showed significant reductions in mean body mass index (BMI) (p<0.001); a significant decrease in mean waist circumference [SASJ from 115.76±11.72 to 84.12±12.87 (p<0.001); SG from 126.68±10.44 to 98.95±11.37 (p<0.001)]. Significant improvements were noted in triglycerides and HDL cholesterol levels among both groups, while the SASJ group showed changes in LDL cholesterol too. Both SASJ and SG groups demonstrated a significant improvement in patients with type II diabetes mellitus (p=0.017 and p=0.046, respectively).

Conclusion: Both procedures significantly could reduce weight and improve comorbidities; however, SASJ was shown to have more benefits, especially in reduction of waist circumference and improvement of lipid profile.

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Introduction

Nowadays, obesity is one of the most complex public health issues. The global prevalence of obesity and overweight is increasing since 1980 and it is estimated that approximately a third of the world population are suffering from these conditions. Despite the differences between the geographical, socioeconomic and ethnicity

status, the prevalence has increased among both children and adults all over the world (1). Due to increasing rate of obesity, the medical care system has tried to establish an effective long term clinical intervention. Therefore, bariatric surgery has been introduced as the most effective therapeutic method for morbid obesity and its comorbidities (2). This method is especially administered for class II and III obese patients who have underlying diseases and obesity complications. Bariatric surgery has the potential of long term relief; while the life style modification and medical therapy have short term effects. Also, it is a cost-benefit approach with worldwide variations in procedures (3). In spite of the standard bariatric procedure, new approaches seem necessary to be individualized according to each patient (4).

This kind of surgery is categorized into three groups according to their physiological mechanisms including restrictive methods to limit the consumption by reducing the gastric capacity, malabsorptive methods to reduce the absorption of nutrients, and finally combination of these two methods to present both effects. A variety of methods are available such as laparoscopic sleeve gastrectomy (LSG), Roux-en-Y gastric bypass (RYGB) and pancreaticobiliary diversion (PBD). As a new method, single anastomosis sleeve jejunal (SASJ) bypass was introduced as an extension of SASI bypass technique. In this procedure, the length of biliopancreatic limb is shorter than single anastomosis sleeve ileal (SASI) bypass in order to ameliorate the long term nutritional outcomes (5). Primary evaluations showed a decrease in hypoalbuminemia and excessive weight loss in SASJ (6). Therefore, it was introduced as a method that may replace other approaches (7, 8); however, the safety and efficacy of the method still need to be evaluated in comparison to other techniques.

During SASJ, the reduction in appetite is due to the decrease in ghrelin after sleeve gastrectomy and stimulation of the satiety hormones that causes a decrease in bowel movement and a delay in gastric emptying (9-11). SASJ bypass has both the metabolic advantages of sleeve gastrectomy and gastric bypass with surveillance of esophagogastroduodenoscopy (EGD) which is important especially in high risk patients for gastric cancer (12, 13). Therefore, it is feasible to choose a procedure like SASJ bypass to allow a regular EGD. Follow- ups of the patients who underwent SASJ are short-term in the literature; and also there are few studies about the safety and efficacy of SASJ bypass (10, 14-16). Therefore, in order to assess different aspects of this method; further studies are needed. So our study aimed to compare the effects of SASJ and sleeve gastrectomy on weight loss and metabolic comorbidities among Iranians patients with morbid obesity in a multicenter retrospective cohort study.

Materials and Methods

In a multicenteric observational-analytical retrospective cohort study from January 2019 to January 2024 at Faghihi, Mother and Child and Abou Ali Sina hospitals affiliated to Shiraz University of Medical Sciences in Shiraz, Southern Iran; 61 patients (32 underwent SASJ and 29 underwent SG) were enrolled. The study protocol was approved by the ethics committee of Shiraz University of Medical Sciences under number of IR.SUMS.MED.REC.1402.408. This study included the patients who suffered from morbid obesity with a body mass index (BMI) equal or greater than 40 Kg/m^2 or greater than 35 Kg/m^2 associated with an underlying disease such as type 2 diabetes mellitus (T2DM), hypertension, fatty liver and sleep apnea. The exclusion criteria were alcohol and narcotics consumption, suffering from uncontrolled severe psychiatric illness, uncontrolled severe bulimia, reversible endocrine diseases that cause obesity, and being ASA class IV. The SASJ and SG techniques were explained to all the patients and a written informed consent was available in the preoperative evaluation. The patients had regular follow ups at 3, 6, 9 and 12 months after surgery.

All patients underwent complete evaluation including a thorough history and physical examination for T2DM and hypertension, biochemical tests for lipid profile [Triglyceride (TG), cholesterol, High-Density Lipoprotein (HD), Low Density Lipoprotein (LDL)] and assessment of BMI and waist circumference. Also, demographic data and clinical records were extracted from the patients' files; including age, gender, physical activity, intake of supplements and drugs, life style and the past medical history. Pre- and post-operative BMI and laboratory data were gathered for 3, 6, 9 and 12 months follow ups after surgery. Missing data were completed by phone calls.

Regarding surgical techniques, after general anesthesia in reverse trendelenburg position, the optical trocar was inserted in the midline and about 15 cm below the xyphid process. After CO_2 insufflation, the 12 mm working trocar was inserted in left lower quadrant (LLQ), and then followed by insertion of a 5 mm trocar in right upper quadrant (RUQ). Also, a 5 mm trocar was used for liver retraction. Then, initial evaluation was performed. Laparoscopic sleeve gastrectomy was initiated by

dissection and releasing of the greater curvature from all attachments from 5 cm proximal to the pylorus to the angle of His and the left crura. The gastroepiploic vessels were divided near the stomach and continued toward the short gastric vessels. The nasogastric tube was removed and replaced by a Bougie (size 36) directed along the lesser curvature toward the pylorus. Sequential firings of the stapler divided the stomach along the Bougie. The specimen and the Bougie were removed and after the leak test, oversewing of the staple line was performed. To conduct SASJ bypass, the sleeve gastrectomy procedure was followed with gastrostomy in the antrum of sleeved stomach. The whole course of the small bowel was measured and then side to side anastomosis was done between the jejunum ranged from 150 to 200 cm at one third of the small bowel from the Treitz ligament and the site of gastrostomy using linear endo-stapler (length of anastomosis was 3 cm) to create hand sewn anterior wall anastomosis. Air leak test was carried out and lembert suturing was performed along the whole staple line. Then, Jackson-Pratt (JP) drain was inserted and after methylene blue test in the first day post-operation, the drain was removed to check for presence of a clear liquid.

The study's statistical analysis was done by SPSS software (Version 17, Chicago, IL, USA). To evaluate the normality of data and distribution, the Kolmogorov- Smirnov test was utilized. T test was used pre and post-operatively to compare the quantitative variables between SASJ and SG groups. Paired sample t test was employed to evaluate the pre and post-operation changes in each group. The Chi-Square test analyzed the qualitative variables while Mann-Whitney and Wilcoxon tests were used for non-normal distribution. The p value<0.05 was considered statistically significant.

Results

Among 61 enrolled patients, 82% were female. According to the type of surgery, 32 (52.5%) patients underwent SASJ [24 (75%) females and 8 (25%) males] and 29 (47.5%) patients underwent SG [26 (89.7%) females and 3 (10.3%) males]. Also, the average height of the patients was 163.88 cm which was distributed normally. Lipid profile disturbance was the most common comorbidity together with high levels of BMI pre-operatively (47.61±4.53) and waist circumference (115.76±15.72). The follow up of the patients was 12 months after surgery. Before the operation, the BMI mean was 42.67±4.64 in SG group when compared to 47.12±4.54 in SASJ one. A significant difference (p<0.001) was noticed between the two groups indicating a higher BMI in SASJ group. One year post-operation, the BMI mean was 28.30±3.98 for SG patients versus 28.78±3.23 for SASJ patients revealing weight loss among both groups; but without any significant statistical difference (p=0.654). Considering the waist circumference in SG group, it was 126.28±9.81 versus 115.50±11.21 in SASJ group, preoperatively (p<0.001); while it was 98.95±11.38 and 83.37±12.68 in SG and SASJ groups, respectively, one year after surgery (p<0.001).

Before surgical intervention, type II diabetes mellitus was detected in 6.9% of SG group when compared to 31.3% of SASJ group and the difference was statistically significant. However, 12 months post-operation, 2 (6.3%) patients from SASJ group and one (3.4%) from SG group showed improvement; while 8 (25%) and one (3.4%) patients from SASJ and SG groups had complete remission, respectively. There was a significant relationship between the kind of surgery and post-operative improvement rate (p=0.046) demonstrating a stronger impact for SASJ. Hypertension as a preoperative comorbidity was detected in 12 patients (6.9% in SG versus 33.3% in SASJ group). There was no significant correlation between the operation type and post-operative improvement for hypertension (p=0.962).

The primary pre-operative TG level was 158.44±92.52 mg/dL when compared to twelve months post-operation as 107.95±50.73 mg/dL (p<0.001). The basic pre- and post-operative HDL levels were 46.52±13.34 mg/dL and 48.92±9.39 mg/dL (p>0.05), respectively. The LDL level was 109.10±27.73 mg/dL and 99.17±26.99 mg/dL (p>0.05) pre- and post-operation, respectively. Prior to any surgery, the total cholesterol level was 166.86±34.95 mg/dL and 189.72±24.73 mg/dL in SG and SASJ groups, respectively (p=0.012); while 12 months post- operation, it was 170.92±35.44 mg/dL in SG group compared to 169.61±23.96 mg/dL in SASJ group, (p>0.05). TG and HDL showed a similar reduction trend during the study. Post-operative LDL level was constant without any statistically significant difference between the groups.

Discussion

Our study investigated the effect of SG and SASJ on weight loss and metabolic comorbidities in 61 obese patients. Patients experienced significant reductions for weight, waist circumference, and BMI after both SG and SASJ techniques, as similarly noted in previous studies (8, 17-20). Moreover after 12 months, there was no significant difference for the decline in BMI between the two groups. The study conducted by Mansourpour and colleagues demonstrated a positive impact of both SG and SASJ

techniques on BMI reduction and improvement of lipid profile. Sayyadi Shahraki *et al.* also reported a BMI reduction among both groups (20). Abdezaher *et al.* and Sayyadi Shahraki *et al.* have also emphasized the effectiveness of both approaches to reach a significant weight loss (20, 21).

We observed a higher preoperative BMI in the SASJ group, as also reported by Abdezaher *et al.* indicating that individuals who were more obese could opt SASJ as their preferred form of treatment. Our study illustrated metabolic improvements for both methods, such as a reduction in TG and a slight increase in HDL cholesterol level twelve months after surgery, highlighting the significance of bariatric surgery in managing metabolic disorders. The present study revealed a significant improvement for T2DM and hypertension as comorbidities associated with obesity. These findings highlight the potential influence of these surgical interventions on both physical and metabolic factors. Elrefai *et al.* conducted a prospective randomized trial study on 60 patients who underwent surgery, dividing them into three equal groups of SASJ, LSG, and One-anastomosis gastric bypass (OAGB). Two out of eleven cases diagnosed with T2DM in the SASJ group did not show any resolution at one-month follow-up. However, all eleven cases achieved complete resolution at 3-month follow-up and maintained the same condition throughout the study period. The reason behind the remission of T2DM after the SASJ procedure could be attributed to a combination of reduced calorie consumption and the quick transportation of nutrients to the end of the intestine, causing a feeling of fullness and the release of hormones that lowered blood sugar levels (22).

The study limitations were the small sample size, the retrospective nature of the study, and the short-term follow-up. Despite the small sample size of this study, the same team performed all the operations, and the patients were subjected to the same uniform technique and received a precise follow-up. However, further prospective well-designed studies with an appropriate sample size should be conducted to achieve more accurate conclusion in treatment of morbid obesity.

Conclusion

SG and SASJ were shown to be effective methods in treatment of morbid obesity and its related comorbidities. Both techniques had significant impact on weight loss and improvement of metabolic comorbidities including a reduction in BMI, waist circumference, and TG level and a mild increase in HDL level together with improvement or remission of T2DM and HTN, one year after the operation. However, SASJ wasexhibited to offer additional benefits, especially in reduction of waist circumference, improvement of T2DM and certain lipid profile. These data showed that the current approaches regarding the patient's specific health profile and the surgical options can ameliorate the outcomes; while the approaches should always be chosen according to the patient's condition.

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Authors' Contribution

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work. Concept and design: S.V.H. and N.M. Acquisition, analysis, or interpretation of data: N.H., I.J., M.M.S. and S.S. Drafting of the manuscript: M.S.F., I.J. and S.S. Critical review of the manuscript for important intellectual content: S.V.H. and N.M. Supervision: S.V.H., N.M. and N.H.

Conflict of Interest

None declared.

References

1 Chooi YC, Ding C, Magkos F. The epidemiology of obesity. *Metabolism*. 2019;92:6-10. DOI: 10.1016/j.metabol.2018.09.005. PMID: 30253139.

2 Angrisani L, Santonicola A, Iovino P, et al. IFSO worldwide survey 2016: primary, endoluminal, and revisional procedures. *Obes Surg*. 2018;28:3783-94. DOI: 10.1007/s11695-018-3450-2. PMID: 30121858.

3 Welbourn R, Hollyman M, Kinsman R, Dixon J, Liem R, Ottosson J, et al. Bariatric surgery worldwide: baseline demographic description and one-year outcomes from the fourth IFSO global registry report 2018. *Obes Surg*. 2019;29:782-95. DOI: 10.1007/s11695-018-3593-1. PMID: 30421326.

4 Mahawar KK, Borg CM, Agarwal S, et al. Criteria for inclusion of newer bariatric and metabolic procedures into the mainstream: a survey of 396 bariatric surgeons. *Obes Surg*. 2017;27:873-80. DOI: 10.1007/s11695-016-2398-3. PMID: 27709488.

5 Pazouki A, Kermansaravi M. Single anastomosis sleeve-jejunal bypass: a new method of bariatric/metabolic surgery. *Obes Surg*. 2019;29:3769-70. DOI: 10.1007/s11695-019-04016-x. PMID: 31254211.

6 Kermansaravi M, Kabir A, Pazouki A. 1-Year

follow-up of single anastomosis sleeve ileal (SASI) bypass in morbid obese patients: efficacy and concerns. *Obes Surg*. 2020;30:4286-92. DOI: 10.1007/s11695-020-04781-0. PMID: 32681291.

7 Sewefy AM, Atyia AM, Mohammed MM, et al. Single anastomosis sleeve jejunal (SAS-J) bypass as a treatment for morbid obesity, technique and review of 1986 cases and 6 Years follow-up. Retrospective cohort. *Int J Surg*. 2022;102:106662. DOI: 10.1016/j.ijsu.2022.106662. PMID: 35568310.

8 Sewefy AM, Saleh A. The outcomes of single anastomosis sleeve jejunal bypass as a treatment for morbid obesity (two-year follow-up). *Surg Endosc*. 2021;35:5698-704. DOI: 10.1007/s00464-020-08029-x. PMID: 32989534.

9 Santoro S, Klajner S, Sampaio R. Sleeve gastrectomy and transit bipartition. Obesity and Diabetes: New Surgical and Nonsurgical Approaches: Springer; 2014.p.89-110.

10 Emile SH, Madyan A, Mahdy T, et al. Single anastomosis sleeve ileal (SASI) bypass versus sleeve gastrectomy: a case-matched multicenter study. *Surg Endosc*. 2021;35:652-60. DOI: 10.1007/s00464-020-07430-w. PMID: 32072282.

11 Bhandari M, Fobi M, Buchwald JN. Standardization of bariatric metabolic procedures: world consensus meeting statement. *Obes Surg*. 2019;29:309-45. DOI: 10.1007/s11695-019-04032-x. PMID: 31297742.

12 Demirbas BT, Erdim A, Celikel C, et al. Is it necessary to send the sleeve gastrectomy specimens to pathology? *Surg Laparosc Endosc Percutan Tech*. 2019;29:117-9. DOI: 10.1097/SLE.0000000000000607. PMID: 30520811.

13 Safaan T, Bashah M, El Ansari W, et al. Histopathological changes in laparoscopic sleeve gastrectomy specimens: prevalence, risk factors, and value of routine histopathologic examination. *Obes Surg*. 2017;27:1741-1749. DOI: 10.1007/s11695-016-2525-1. PMID: 28063114.

14 Mahdy T, Al Wahedi A, Schou C. Efficacy of single anastomosis sleeve ileal (SASI) bypass for type-2 diabetic morbid obese patients: gastric bipartition, a novel metabolic surgery procedure: a retrospective cohort study. *Int J Surg*. 2016;34:28-34. DOI: 10.1016/j.ijsu.2016.08.018. PMID: 27545956.

15 Madyan A, Emile SH, Abdel-Razik MA, et al. Laparoscopic single anastomosis sleeve ileal (SASI) bypass for patients with morbid obesity: technical description and short-term outcomes. *Surg Laparosc Endosc Percutan Tech*. 2020;30(2):e13-e7. DOI: 10.1097/SLE.0000000000000763. PMID: 32032329.

16 Mahdy T, Emile SH, Madyan A, et al. Evaluation of the efficacy of single anastomosis sleeve ileal (SASI) bypass for patients with morbid obesity: a multicenter study. *Obes Surg*. 2020;30:837-45. DOI: 10.1007/s11695-019-04296-3. PMID: 31734889.

17 Rezaei MT, Sheikhbahaei E, Zefreh H, et al. Single-anastomosis Sleeve Jejunal: a Mid-term Follow-up Report of a New Surgical Technique. *Obes Surg*. 2023;33:1245-52. DOI: 10.1007/s11695-023-06520-7. PMID: 36847922.

18 Sewefy AM, Atyia AM, Mohammed MM, et al. Single anastomosis sleeve jejunal (SAS-J) bypass as a treatment for morbid obesity, technique and review of 1986 cases and 6 Years follow-up. Retrospective cohort. *Int J Surg*. 2022;102:106662. DOI: 10.1016/j.ijsu.2022.106662. PMID: 35568310.

19 Robert M, Pasquer A, Pelascini E, et al. Impact of sleeve gastrectomy volumes on weight loss results: a prospective study. *Surg Obes Relat Dis*. 2016;12:1286-91. DOI: 10.1016/j.soard.2016.01.021. PMID: 27134194.

20 Sayadishahraki M, Rezaei MT. Single Anastomosis Sleeve Jejunal Bypass (SASJ) Versus Roux-en-Y Gastric Bypass in Patients with Obesity. *J Isfahan Med School*. 2020;38:49-54.

21 Abdelzaher MA, Touny MN, Atiya AM, et al. Short term outcomes of single anastomosis sleeve jejunal bypass for the treatment of morbidly obese patients. Minia J Med Res. 2023.

22 Elrefai M, Ibrahim A, Zeid MA, et al. Comparative study between single anastomosis sleeve jejunal bypass, sleeve gastrectomy and one anastomosis gastric bypass: A prospective randomized trial. 2022.