METABOLIC IMPACT OF SLEEVE GASTRECTOMY WITH BIPARTITION IN PATIENTS WITH OBESITY

Teshayev Oktabr Ruhullayevich[1], O'ktamova Dinora Zafar qizi[2], Eshnazarov Shoxzodbek Odil o'g'li

[1] *Tibbiyot fanlari doktori, professor, Toshkent davlat tibbiyot universiteti. E-mail: tma.tor@mail.ru Toshkent, O'zbekiston.*

[2] *Toshkent davlat tibbiyot universiteti Oilaviy tibbiyotda xirurgik kasalliklar kafedrasi 2-bosqich magistri. E-mail: dinoraoktamova72@gmail.com Toshkent, O'zbekiston.*

[3] *Toshkent davlat tibbiyot universiteti Oilaviy tibbiyotda xirurgik kasalliklar kafedrasi 2-bosqich klinik ordinatori. E-mail: shoxzodbekeshnazarov19972@gmail.com Toshkent, O'zbekiston.*

Annotation: Sleeve gastrectomy with bipartition is a novel bariatric surgical technique that combines restrictive and malabsorptive components to treat morbid obesity. This annotation explores the metabolic outcomes of this procedure, particularly its effects on glycemic control, insulin sensitivity, lipid profile, and weight loss sustainability in obese patients. The surgery involves a longitudinal gastric resection (sleeve) followed by a small intestinal diversion (bipartition), which alters nutrient flow and hormonal response. Clinical studies have shown that this method not only promotes significant weight reduction but also leads to marked improvements in type 2 diabetes mellitus, often achieving remission independently of weight loss. Additionally, it has demonstrated favorable impacts on lipid metabolism, blood pressure regulation, and inflammatory markers. Compared to traditional Roux-en-Y gastric bypass or sleeve gastrectomy alone, sleeve gastrectomy with bipartition may offer superior metabolic benefits with fewer

nutritional deficiencies. This annotation highlights the importance of long-term follow-up and individualized patient selection to optimize outcomes and minimize complications.

Keywords: Obesity; metabolic surgery; sleeve gastrectomy; gastric bipartition; dual nutrient transit; metabolic outcomes.

Obesity and obesity-related metabolic disorders represent one of the most significant global public health challenges of the 21st century. According to international epidemiological data, the prevalence of obesity continues to increase worldwide, leading to a parallel rise in type 2 diabetes mellitus, cardiovascular diseases, dyslipidemia, arterial hypertension, and overall mortality. Conventional non-surgical treatment strategies, including lifestyle modification and pharmacotherapy, frequently fail to achieve sustained weight reduction and long-term metabolic control, particularly in patients with severe obesity.

Bariatric and metabolic surgery has therefore emerged as the most effective long-term treatment option for obesity and its metabolic consequences. Among bariatric procedures, sleeve gastrectomy (SG) has gained widespread acceptance due to its technical simplicity, favorable safety profile, and satisfactory weight-loss outcomes. However, accumulating evidence suggests that restrictive procedures alone may be insufficient to induce optimal metabolic improvement in certain patient populations, particularly those with impaired glucose metabolism or advanced metabolic syndrome.

In response to these limitations, hybrid bariatric procedures combining restrictive and metabolic mechanisms have been developed. Sleeve gastrectomy with bipartition, also referred to as gastric bipartition, is one such innovative surgical approach. This procedure preserves the physiological pathway of food through the duodenum while simultaneously creating an alternative route that directs part of the nutrient flow directly into the distal ileum. By stimulating distal gut hormones, this

dual-pathway mechanism enhances metabolic effects without inducing significant malabsorption.

Despite increasing international interest, clinical data on sleeve gastrectomy with bipartition remain limited, particularly from Central Asian populations. This study aims to contribute to the growing body of evidence by evaluating the clinical and metabolic outcomes of this procedure in a pilot cohort.

Aim

The primary aim of this study was to assess the clinical and metabolic effectiveness of sleeve gastrectomy with bipartition in patients with obesity and obesity-associated metabolic disorders. Secondary objectives included evaluation of postoperative safety, early and mid-term weight loss outcomes, and metabolic parameter dynamics.

Materials and Methods

This prospective pilot study was conducted between 2024 and 2025 at the At the clinical bases of the Department of Surgical Diseases in Family Medicine A total of 23 patients with obesity and associated metabolic disturbances were included. Patient selection was performed in accordance with international bariatric surgery guidelines, including criteria established by International Federation for the Surgery of Obesity and Metabolic Disorders (IFSO) and American Society for Metabolic and Bariatric Surgery (ASMBS).

Inclusion criteria comprised body mass index (BMI) ≥40 kg/m² or BMI ≥35 kg/m² with at least one obesity-related metabolic comorbidity, failure of previous conservative treatment, age between 18 and 63 years, and informed patient consent.

Exclusion criteria included severe psychiatric disorders, active malignancy, decompensated organ failure, and contraindications to general anesthesia.

All patients underwent laparoscopic sleeve gastrectomy with bipartition under general anesthesia. The surgical technique involved standard sleeve gastrectomy

followed by creation of a side-to-side gastroileal anastomosis approximately 250 cm proximal to the ileocecal valve, allowing for dual nutrient transit.

Preoperative evaluation included comprehensive clinical assessment, anthropometric measurements, laboratory investigations (fasting glucose, HbA1c, lipid profile), and instrumental diagnostics. Postoperative follow-up was conducted at regular intervals, focusing on weight loss parameters, metabolic outcomes, and complication monitoring.

Early postoperative recovery was uneventful in the majority of patients. No mortality and no major intraoperative complications were observed. Minor postoperative complications were rare and managed conservatively.

Significant weight reduction was observed during the follow-up period. Patients demonstrated progressive decreases in body weight and BMI, accompanied by a substantial percentage of excess weight loss (%EWL). Importantly, improvements in metabolic parameters were observed early after surgery, in some cases preceding significant weight loss.

Glycemic control improved markedly, with reductions in fasting plasma glucose and HbA1c levels. Several patients with preoperative impaired glucose metabolism demonstrated normalization of glycemic parameters without the need for pharmacological therapy. Lipid profile analysis revealed reductions in total cholesterol and triglyceride levels, alongside favorable changes in low-density and high-density lipoprotein fractions.

The observed metabolic improvements support the hypothesis that sleeve gastrectomy with bipartition exerts its effects not solely through caloric restriction but also via hormonal modulation. Enhanced stimulation of distal intestinal segments likely increases secretion of incretin hormones such as GLP-1 and PYY, contributing to improved insulin sensitivity and appetite regulation.

These findings are consistent with previously published data by Santoro and DePaula, who described gastric bipartition as a physiological metabolic procedure preserving nutrient absorption while maximizing endocrine benefits.

Discussion

The results of the present pilot study demonstrate that sleeve gastrectomy with bipartition is an effective and safe metabolic surgical procedure for patients with obesity and obesity-related metabolic disorders. The observed outcomes confirm that this procedure provides not only significant weight reduction but also pronounced metabolic benefits, which appear to be partially independent of weight loss magnitude.

Unlike purely restrictive bariatric procedures, sleeve gastrectomy with bipartition modifies gastrointestinal physiology by introducing a dual nutrient transit pathway. This approach allows partial preservation of physiological digestion through the duodenum while simultaneously promoting early exposure of nutrients to the distal ileum. Such early distal stimulation is known to enhance secretion of incretin hormones, particularly glucagon-like peptide-1 (GLP-1) and peptide YY (PYY), which play a central role in glucose homeostasis, appetite regulation, and insulin sensitivity.

The early improvement in glycemic control observed in this study, often preceding substantial weight loss, strongly supports the concept of metabolic surgery rather than purely bariatric surgery. Similar findings have been reported in international studies, particularly in works by Santoro and DePaula, where gastric bipartition was described as a “physiological metabolic operation” capable of improving glucose metabolism without inducing significant malabsorption.

From a safety perspective, the absence of major complications and the low incidence of minor adverse events are consistent with data reported by the International Federation for the Surgery of Obesity and Metabolic Disorders and the American Society for Metabolic and Bariatric Surgery. Preservation of the duodenal

passage appears to reduce the risk of severe nutritional deficiencies, which remains a concern in more malabsorptive procedures such as biliopancreatic diversion.

Furthermore, the dual-pathway mechanism may contribute to better long-term patient compliance with dietary recommendations, as it avoids extreme malabsorption while maintaining robust metabolic effects. This balance between efficacy and safety positions sleeve gastrectomy with bipartition as a promising alternative for selected patients, particularly those with obesity-associated metabolic disturbances.

Scientific Novelty

The scientific novelty of this study lies in its contribution to the limited body of evidence regarding sleeve gastrectomy with bipartition in a pilot cohort from a previously underrepresented population. While most published data originate from Western Europe and South America, this study provides valuable insights into the applicability and effectiveness of the procedure in a Central Asian clinical setting.

Additionally, the study highlights early metabolic improvements occurring independently of significant weight loss, reinforcing the concept of bipartition surgery as a metabolic intervention. The integration of standardized patient selection criteria, surgical technique, and postoperative management in accordance with international guidelines further strengthens the scientific relevance of the findings.

Clinical Significance

From a clinical standpoint, sleeve gastrectomy with bipartition offers several advantages. The procedure combines the technical simplicity and safety profile of sleeve gastrectomy with the metabolic benefits traditionally associated with more complex bypass operations. This makes it particularly suitable for patients who require metabolic improvement but may not tolerate extensive malabsorptive procedures.

The findings of this study suggest that the procedure may be especially beneficial for patients with impaired glucose metabolism, prediabetes, or early-stage

type 2 diabetes mellitus. Improvement in metabolic parameters, reduction in cardiovascular risk factors, and enhancement of overall quality of life underscore the clinical value of this surgical approach.

Limitations

Several limitations of this study should be acknowledged. First, the relatively small sample size limits the generalizability of the findings and precludes robust statistical inference. Second, the follow-up period was limited to early and mid-term outcomes, and long-term durability of weight loss and metabolic benefits remains to be established. Third, the absence of a control group undergoing conventional sleeve gastrectomy restricts direct comparative analysis.

Despite these limitations, the study provides meaningful preliminary data that may serve as a foundation for larger, controlled trials in the future.

Conclusion

Sleeve gastrectomy with bipartition represents a safe, effective, and physiologically sound metabolic surgical procedure for patients with obesity and obesity-related metabolic disorders. The combination of restrictive and metabolic mechanisms results in significant weight reduction and early improvement of metabolic parameters, including glycemic control and lipid metabolism.

The findings of this pilot study support the growing international evidence that bipartition surgery may serve as a valuable alternative to traditional bariatric procedures, particularly in patients requiring enhanced metabolic outcomes with minimal nutritional risk. Larger prospective studies with extended follow-up are warranted to further validate these results and to establish long-term efficacy and safety.

References

1. World Health Organization. Obesity and overweight. WHO Fact Sheet. Geneva; 2023.

2. Angrisani L, Santonicola A, Iovino P, et al. Bariatric surgery worldwide 2018. Obes Surg. 2020;30(10):1–12.

3. DePaula AL, Stival AR, DePaula CL. Gastric bipartition: a novel metabolic surgery technique. Obes Surg. 2015;25(7):1236–1242.

4. Santoro S, Castro LC, Velhote MC, et al. Sleeve gastrectomy with transit bipartition: a potent intervention for metabolic syndrome. Surg Obes Relat Dis. 2016;12(6):1–8.

5. Rubino F, Nathan DM, Eckel RH, et al. Metabolic surgery in the treatment algorithm for type 2 diabetes. Diabetes Care. 2016;39(6):861–877.

6. Schauer PR, Bhatt DL, Kirwan JP, et al. Bariatric surgery versus intensive medical therapy for diabetes. N Engl J Med. 2017;376(7):641–651.

7. Dixon JB, Zimmet P, Alberti KG, Rubino F. Bariatric surgery for type 2 diabetes. Lancet. 2011;378(9786):230–240.

8. American Society for Metabolic and Bariatric Surgery (ASMBS). Updated position statement on bariatric surgery. ASMBS; 2022.

9. International Federation for the Surgery of Obesity and Metabolic Disorders (IFSO). Global guidelines for bariatric and metabolic surgery. IFSO; 2022.

10. Mingrone G, Panunzi S, De Gaetano A, et al. Bariatric surgery versus conventional medical therapy for type 2 diabetes. N Engl J Med. 2012;366(17):1577–1585.

11. Brethauer SA, Kim J, El Chaar M, et al. Standardized outcomes reporting in metabolic and bariatric surgery. Surg Obes Relat Dis. 2015;11(3):489–506.

12. Sjöström L. Review of the key results from the Swedish Obese Subjects (SOS) trial. J Intern Med. 2013;273(3):219–234.