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Impact of Preoperative Gastroesophageal Reflux on Clinical Outcomes After Standard Laparoscopic Mini-Gastric Bypass: stratified analysis and scoring-based evaluation

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ABSTRACT

Introduction. *The role of gastroesophageal reflux disease (GERD) in determining outcomes after laparoscopic mini-gastric bypass (LMGB) remains a subject of active debate. This study investigates the influence of preoperative GERD on early postoperative recovery, symptom control, and functional effectiveness of standard LMGB using a composite scoring scale.*

Materials and Methods. *A total of 68 patients with morbid obesity who underwent standard LMGB were divided into two subgroups: with GERD (n=32) and without GERD (n=36). Symptom dynamics, food tolerance, need for symptomatic medication, and integrated scores were assessed on postoperative days 3, 7, 14, and 30.*

Results. *Patients with preoperative GERD showed higher rates of reflux symptoms on all evaluation days (up to 68.8% on day 7), lower food tolerance (only 25% by day 30), and significantly greater need for symptomatic therapy (81.3%). Their mean integrated score at day 30 was 23.25±4.1, compared to 29.28±3.5 in GERD-negative patients. Moreover, 53.1% of GERD-positive patients fell into the «unsatisfactory» result category.*

Conclusion. *Preoperative GERD significantly worsens early clinical outcomes of standard LMGB. Stratified analysis confirms that reflux status is a strong predictor of postoperative recovery, and supports the need for individualized surgical planning in this population.*

Keywords: *Mini-gastric bypass; gastroesophageal reflux; clinical stratification; early outcome; scoring system.*

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INTRODUCTION

Laparoscopic mini-gastric bypass (LMGB), or one-anastomosis gastric bypass (OAGB), has emerged as a widely accepted bariatric technique due to its technical simplicity, shorter operative time, and proven effectiveness in inducing weight loss and metabolic improvement [1, 2]. However, when applied to patients with concurrent gastroesophageal reflux disease (GERD), the procedure raises important concerns regarding postoperative symptom control and the risk of reflux persistence or exacerbation [3-5].

Unlike Roux-en-Y gastric bypass, LMGB features a single-loop reconstruction without diverting the biliopancreatic limb, which can facilitate retrograde flow of bile and gastric contents into the gastric pouch and esophagus. This anatomical configuration is particularly problematic in patients with preoperative GERD or hypotonic lower esophageal sphincter, where the gastroesophageal barrier is already compromised [6]. Systematic reviews indicate that reflux symptoms persist in up to one-third of patients post-LMGB and may even worsen in those with prior GERD [7, 8].

While some studies report that LMGB can reduce GERD symptoms due to rapid weight loss and reduced intragastric pressure [9], others note a high incidence of persistent heartburn, regurgitation, and esophagitis-especially in patients with pathologic acid exposure preoperatively [10, 11]. Despite these observations, most outcome analyses aggregate patients without stratification by GERD status, which may mask clinically relevant differences.

This study aims to assess the influence of preoperative GERD on early clinical outcomes after standard LMGB, focusing on symptom evolution, food tolerance, medication use, and functional recovery. Using a composite scoring system, we compared the recovery dynamics in GERD-positive and GERD-negative subgroups to determine whether reflux status can predict short-term surgical success.

MATERIALS AND METHODS

This retrospective cohort study included 68 patients (aged 29-61 years) with morbid obesity (BMI > 40 kg/m² or > 35 kg/m² with comorbidities) who underwent standard laparoscopic mini-gastric bypass (LMGB) between January 2020 and May 2023. All operations were performed by the same surgical team using a consistent technique: formation of a narrow gastric pouch (~20 cm in length) and a single gastrojejunal anastomosis at 200 cm distal to the ligament of Treitz.

Preoperative evaluation included a structured interview, upper endoscopy (EGD), and, when indicated, 24-hour esophageal pH-metry. Based on the presence or absence of clinical and instrumental signs of gastroesophageal reflux disease (GERD), patients were divided into two subgroups:

- Subgroup I (n=32): patients with preoperative GERD symptoms (heartburn, sour taste, nocturnal regurgitation) and/or documented esophagitis or abnormal pH metrics.
- Subgroup II (n=36): patients without GERD symptoms or endoscopic/pH evidence of reflux.

All patients were followed postoperatively on days 3, 7, 14, and 30. Clinical symptoms (heartburn, epigastric pain, regurgitation, nausea, nocturnal cough, and bitter taste) were recorded using a standardized questionnaire. Symptom severity was graded on a 4-point scale (0=none, 1=mild, 2=moderate, 3=severe).

Functional recovery was assessed by:

- subjective food tolerance (excellent, good, moderate, poor);
- need for symptomatic medications (PPI, prokinetics, antacids);
- presence of ≥2 GERD-related symptoms;
- presence of bile in the gastric pouch on endoscopy (when performed selectively on day 30).

Outcome assessment was based on a previously validated integral scoring system that included clinical symptoms, oral intake, medication use, and endoscopic data. Each component was scored from 0 to 12 points, with total possible score = 48. Patients were classified as:

- Excellent: ≥36 points
- Satisfactory: 24–35 points
- Unsatisfactory: ≤23 points

Statistical analysis was performed using SPSS 25.0 (IBM Corp., USA). Categorical variables were compared using the chi-square test or Fisher's exact test; continuous variables were assessed by Mann–Whitney U test. A p-value < 0.05 was considered statistically significant.

RESULTS

A total of 68 patients were analyzed: 32 (47.1%) with preoperative GERD (Subgroup I) and 36 (52.9%) without GERD (Subgroup II). Baseline demographic and anthropometric characteristics were comparable between the groups (p > 0.05), with a slightly higher prevalence of insulin resistance and dyslipidemia in Subgroup I.

Symptom dynamics revealed marked intergroup differences. On postoperative day 3, 62.5% of patients in Subgroup I reported heartburn, regurgitation, and epigastric discomfort, compared to 25.0% in Subgroup II ($p<0.01$). By day 30, these symptoms persisted in 56.3% and 13.9% of patients, respectively. Regurgitation with bitter taste and nocturnal reflux episodes were reported by 40.6% of patients with GERD and 8.3% of patients without GERD at day 30.

Food tolerance improved gradually in both groups but remained significantly worse in GERD-positive patients. At day 30, only 25.0% of Subgroup I achieved «excellent» or «good» food tolerance, compared to 88.9% in Subgroup II ($p<0.001$).

Use of symptomatic medications also differed notably: 81.3% of Subgroup I required ongoing acid-suppressive and prokinetic therapy at day 30, versus only 13.9% in Subgroup II. Furthermore, 75.0% of GERD-positive patients exhibited ≥2 persistent GERD-related symptoms compared to 27.8% in GERD-negative patients ($p<0.01$).

Endoscopic signs of bile reflux were detected in 90.6% of Subgroup I patients who underwent control EGD and in 47.2% of Subgroup II, despite absence of prior GERD symptoms. These findings highlight the refluxogenic potential of the standard LMGB configuration.

The integral scoring system revealed a significant divergence in outcome categories. At day 30:

- «Excellent» results (≥36 points) were achieved in only 3.1% of Subgroup I vs. 38.9% of Subgroup II;
- «Satisfactory» results (24–35 points) were observed in 43.8% vs. 55.6%, respectively;
- «Unsatisfactory» outcomes (≤23 points) were seen in 53.1% of GERD-positive patients vs. 5.6% of GERD-negative patients ($p<0.001$).

The mean total score at day 30 was 23.25±4.1 in Subgroup I and 29.28±3.5 in Subgroup II ($p<0.01$), indicating significantly impaired functional recovery in patients with preoperative GERD.

DISCUSSION

The results of this study confirm that preoperative gastroesophageal reflux disease (GERD) is a significant negative predictor of early clinical outcomes after standard laparoscopic mini-gastric bypass (LMGB). GERD-positive patients demonstrated persistently higher rates of reflux symptoms, impaired food tolerance, and an increased need for symptomatic medication throughout the first 30 days postoperatively. These findings align with previous observations that standard LMGB, despite its simplicity, lacks an effective anatomical antireflux mechanism [1, 5, 7].

Our data revealed that over half of the patients with pre-existing GERD (53.1%) had unsatisfactory results, and only 3.1% reached the «excellent» category by day 30. This is in contrast to GERD-negative patients, of whom nearly 39% achieved excellent scores. Such disparities suggest that standard LMGB is not equally effective across different reflux phenotypes, and that individualized surgical strategy may be required for optimal outcomes.

Several mechanisms may underlie the observed differences. In GERD-positive individuals, impaired esophageal clearance, hypotonia of the lower esophageal sphincter, and preexisting inflammation create conditions that amplify the effects of retrograde bile flow from the gastrojejunal anastomosis into the gastric pouch and esophagus. This is supported by the high rate of bile visualization during endoscopy (90.6%) and the prevalence of nocturnal regurgitation and cough, which were not effectively resolved by weight loss alone.

Our results are consistent with the literature. Mahawar et al. [6] emphasized the increased risk of reflux-related symptoms in patients with baseline GERD undergoing LMGB. Chevallier et al. [8] also reported reduced patient satisfaction in this group due to persistent discomfort and reliance on acid-suppressive therapy. Conversely, Musella et al. [9] and Lee et al. [2] highlighted that certain anatomical configurations (such as longer pouches or diverted alimentary limbs) can mitigate reflux but may reduce bariatric efficacy or reproducibility.

The current findings further demonstrate the importance of preoperative GERD screening and stratification. Without proper patient selection or technical adaptation, standard LMGB may compromise early recovery and increase healthcare burden through extended therapy and follow-up.

Taken together, this study supports a stratified surgical approach in bariatric patients, wherein GERD-positive individuals may benefit from modified techniques - such as antireflux configuration of the anastomosis or alternative bypass models - to improve both functional and symptomatic outcomes.

CONCLUSION

Preoperative gastroesophageal reflux disease significantly impairs early postoperative recovery following standard laparoscopic mini-gas-

tric bypass. Patients with GERD demonstrated higher rates of persistent reflux symptoms, greater reliance on symptomatic medications, and substantially lower composite outcome scores compared to GERD-negative individuals.

These findings confirm that reflux status is a strong and independent predictor of early surgical outcome, underscoring the importance of patient stratification during preoperative planning. Standard LMGB, while effective in weight reduction, may be suboptimal for patients with pre-existing reflux unless accompanied by an anatomical modification aimed at bile diversion or reflux prevention.

Further research is warranted to determine which technical refinements offer the best balance between antireflux protection and bariatric efficacy in this patient population.

Ethical Approval - The study was approved by the Institutional Ethics Committee of Tashkent State Medical University and was conducted in accordance with the Declaration of Helsinki. Informed consent was obtained from all patients prior to data collection.

Conflict of Interest - The authors declare no conflicts of interest related to this research.

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Author Contributions

U.I. Matkuliev - study concept, methodology, data analysis, manuscript drafting.

J.A. Abduganiyev - clinical data acquisition, surgical performance, literature review, editing.

Both authors approved the final version of the manuscript and are accountable for all aspects of the work.

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STANDART MINI-GASTROSHUNTLASH OPERATSIYASIDAN KEYINGI KLINIK NATIJALARGA OPERATSIYAGACHA MAVJUD BO‘LGAN GASTROEZOFAGEAL REFLYUKSNING TA’SIRI: STRATIFIKATSIYALANGAN TAHLIL VA BALLI BAHOLASH

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ANNOTATSIYA

Kirish: Gastroezofageal reflyuks kasalligining (GERB) laparoskopik mini-gastroshuntlash (LMGSH) natijalariga ta’siri dolzarb mavzulardan biri bo‘lib qolmoqda. Ushbu tadqiqotda GERB bo‘lgan va bo‘lmagan bemorlarda standart LMGSHdan keyingi klinik natijalar, simptomlar dinamikasi va funksional tiklanish balli baholash tizimi asosida solishtirildi.

Materiallar va usullar: 68 bemor ikkita guruhga ajratildi: operatsiyagacha GERB mavjud (n=32) va yo‘q (n=36). Klinik simptomlar, oziq-ovqatga toqat, simptomatik terapiya ehtiyoji va balli baholar 3, 7, 14 va 30-kunlarda baholandi.

Natijalar: GERB bo‘lgan bemorlarda reflyuks simptomlari 30-kungacha saqlanib qoldi (56,3%), oziq-ovqatga toqat past bo‘ldi (faqat 25% yaxshi toqat qildi), simptomatik davo ehtiyoji esa 81,3%ni tashkil etdi. Ularning o‘rtacha balli bahosi 23,25±4,1 bo‘ldi, bu esa GERB bo‘lmaganlar (29,28±3,5) ga nisbatan ancha past. GERB bilan og‘rigan bemorlarning 53,1%ida «qoniqarsiz» natijalar qayd etildi.

Xulosa: Operatsiyagacha bo‘lgan GERB holati standart LMGSHdan keyingi tiklanish samaradorligini sezilarli darajada pasaytiradi. Ushbu holat individual jarrohlik rejalashtirish zarurligini ko‘rsatadi.

Kalit so‘zlar: Mini-gastroshuntlash; gastroezofageal reflyuks; klinik stratifikatsiya; erta natija; balli baholash tizimi.

ВЛИЯНИЕ ПРЕДОПЕРАЦИОННОГО ГАСТРОЭЗОФАГЕАЛЬНОГО РЕФЛЮКСА НА КЛИНИЧЕСКИЕ РЕЗУЛЬТАТЫ СТАНДАРТНОГО ЛАПАРОСКОПИЧЕСКОГО МИНИГАСТРОШУНТИРОВАНИЯ: СТРАТИФИЦИРОВАННЫЙ АНАЛИЗ И БАЛЛЬНАЯ ОЦЕНКА

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АННОТАЦИЯ

Введение: Роль гастроэзофагеального рефлюкса (ГЭРБ) в прогнозе после лапароскопического минигастрошунтирования (ЛМГШ) остаётся предметом дискуссий. Целью настоящего исследования стало изучение влияния предоперационного ГЭРБ на восстановление, контроль симптомов и функциональную эффективность стандартного ЛМГШ с использованием интегральной шкалы оценки.

Материалы и методы: 68 пациентов были разделены на две подгруппы: с ГЭРБ (n=32) и без ГЭРБ (n=36). Симптомы, переносимость пищи, потребность в терапии и баллы по шкале оценивались на 3, 7, 14 и 30 сутки.

Результаты: у пациентов с ГЭРБ на 30-е сутки сохранялись симптомы у 56,3%, переносимость пищи была ниже (лишь 25% оценили как хорошую), потребность в симптоматической терапии составила 81,3%. Средний балл составил 23,25±4,1 против 29,28±3,5 у пациентов без ГЭРБ. Более половины пациентов с ГЭРБ (53,1%) имели «неудовлетворительный» результат.

Заключение: Предоперационный ГЭРБ существенно ухудшает ранние клинические результаты стандартного ЛМГШ. Полученные данные подтверждают необходимость стратифицированного подхода и выбора модифицированной техники в этой категории пациентов.

Ключевые слова: Минигастрошунтирование; гастроэзофагеальный рефлюкс; клиническая стратификация; ранние результаты; шкала балльной оценки.