

Surgical Treatment of Hiatal Hernias

**Khamdamov Bakhtiyor Zarifovich^{*}, Isomutdinov A'zam Zokirovich,
Khamdamov Alisherjon Bakhtiyorovich**

Bukhara State Medical Institute, Bukhara, Uzbekistan

Abstract Unlike traditional methods, which focus primarily on mechanical suturing of the hernia defect, the developed approach takes into account the severity of axial displacement, cardia geometry, the state of the antireflux valve mechanism, and esophageal motility, allowing for the development of a personalized surgical strategy.

Keywords Hiatal hernia, Surgical treatment

1. Introduction

With the increasing surgical activity for hiatal hernia (HH), especially laparoscopic procedures, demands for technical precision, reduction in complications, and prevention of recurrence are increasing [4,7]. The availability of high-tech mesh implants, various fundoplication techniques, and flexible esophageal fixation algorithms require a rethinking of the criteria for their use depending on the specific clinical situation [6,8].

The high prevalence and polymorphism of clinical forms of HH, the ongoing controversy surrounding the choice of surgical approach, the insufficient stratification of treatment approaches, and the high rate of unsatisfactory outcomes make research into optimizing the surgical treatment of various forms of HH extremely relevant and in demand [1,2,3,5,8]. This research is consistent with the priority areas of development in abdominal surgery, addresses the objectives of reducing disability and improving quality of life for patients, and also creates the preconditions for the standardization and personalization of surgical care in this area.

The objective of the study was to develop a modified surgical method for the treatment of esophageal hernias.

2. Materials and Methods

The analysis was conducted at the Bukhara Regional Multidisciplinary Clinic and covered the period 2015-2025. The total sample consisted of 128 patients with esophageal hernias who underwent laparoscopic surgery. The study design was retrospective and prospective.

In accordance with the study methodology, patients were divided into two groups: a control group (63 patients; 49.2%),

operated on between 2015 and 2019 using a traditional technique (posterior crurography and, in some cases, Nissen fundoplication); and a study group (65 patients; 50.8%), who underwent surgery between 2020 and 2025 using a modified technique and an algorithmically based choice of the intervention scope.

Most patients were middle-aged or elderly. The average age ranged from 45 to 74 years. Young patients (18-44 years) accounted for 21.1%, middle-aged patients (45-59 years) - 37.5%, elderly patients (60-74 years) - 31.2%, and patients over 75 years old - 1.6% of the sample.

The study design included eight logically sequential stages, beginning with a retrospective assessment of the results of traditional surgery (control group) and ending with a comparative analysis of long-term results using an integrated scale.

To assess the outcome, two standardized scales were developed and tested: an immediate (up to 30 days after surgery) scale and a long-term treatment outcome scale (at 3, 6, and 12 months after surgery). Each scale had a three-level gradation (good, satisfactory, unsatisfactory result) and allowed for a dynamic assessment of treatment effectiveness with objective reproducibility. Immediate treatment outcomes were assessed for clinical effectiveness, while long-term outcomes were assessed for both clinical outcomes, including quality of life, and anatomical outcomes.

3. Results and Discussion

This study presents a modified surgical technique developed by us, aimed at eliminating not only the anatomical defect but also stabilizing the key functional elements of the hernia. Furthermore, we formulate principles and propose an algorithm for its application, taking into account the severity of axial displacement, motor impairments, anatomical geometry, and compensatory mechanisms identified during preoperative examination.

* Corresponding author:

xamdamov.bakhtiyor@bsmi.uz (Khamdamov Bakhtiyor Zarifovich)

Received: Sep. 30, 2025; Accepted: Oct. 22, 2025; Published: Oct. 31, 2025

Published online at <http://journal.sapub.org/ajmms>

To objectively identify the causes of unsatisfactory results of standard surgical correction for hiatal hernia, a correlation analysis was conducted to determine the relationship between the anatomical and functional characteristics of the hernia and the recurrence rate at long-term follow-up. This approach avoided subjective interpretation and moved from isolated observations to statistically confirmed relationships. The analysis included parameters are obtained preoperatively using a comprehensive instrumental assessment, namely, EGDFS, CT, manometry, pH-metry, as well as clarification of the hernia type according to the Barrett and Hill classifications. The strongest correlation with the 12-month recurrence rate was found for esophageal motility disorders ($r=0.665$), highlighting the importance of assessing peristaltic activity when choosing the extent of surgery.

High correlation coefficients were also observed with increasing gastric migration ($r=0.612$), Hill valve dysfunction ($r=0.578$), and the presence of pathological acid exposure in the distal esophagus ($r=0.604$).

Barrett hernia type also showed a significant correlation ($r=0.531$), particularly with the transition from types I-II to III-IV. These data indicate that anatomical and functional abnormalities of the esophageal motility have predictive value for an unfavorable postoperative course and can be used as a basis for choosing an extended or modified surgical intervention.

International practice shows that despite the widespread prevalence of posterior cruroplasty, the recurrence rate after standard intervention remains significant, especially in mixed forms of posterior hernia and in patients with severe diaphragmatic dysfunction. Attempts to supplement cruroplasty with gastropexy or use mesh implants have often lacked systematic justification for the extent of the intervention depending on the specific morphological type of hernia. In this context, the proposed technique is distinguished by its comprehensive structure and functional selectivity of its components.

The advantages of the proposed modified technique can be summarized as follows:

- pathogenetic focus, where each stage of the intervention is correlated with the specific mechanism of posterior hernia formation: cruroplasty with subalarcotic sutures to stabilize the diaphragmatic orifice; gastropexy to prevent cranial displacement of the cardia; and a "saddle" implant to strengthen the area against the background of reduced tissue resistance. - biomechanical stability of the resulting complex: the use of sutures that distribute the load along an arcuate trajectory eliminates linear tension, reducing the risk of dehiscence and recanalization; the mesh implant does not circumferentially occlude the esophagus, minimizing the risk of dysphagia and cicatricial deformity.
- personalization of the intervention: the technique is not dogmatic, and its elements are applied differentially, depending on the type of hernia, the degree of gastric displacement, and the severity of functional impairment,

ensuring flexibility of the approach.

- technological reproducibility: all manipulations can be performed using a standard laparoscopic approach, without the use of expensive or scarce materials; the technique is easily adapted to the technical conditions of a general surgical department.

Thus, the modified procedure represents a clinically justified and anatomically adapted treatment method capable of restoring the physiological parameters of the esophageal septum.

4. Conclusions

1. The main reasons for the unsatisfactory results of traditional surgical treatments for esophageal hernias are the failure to consider the morphofunctional characteristics of the disease and the use of a standardized approach regardless of hernia type, degree of migration, or valve mechanism status. This has resulted in a high rate of complications in the postoperative period, the development of severe dysphagia, retrosternal pain, and persistent heartburn during the immediate follow-up period, as well as hernia recurrence, dyspeptic disorders, and a decrease in quality of life in the late postoperative period.
2. Unlike traditional methods, which focus primarily on mechanical suturing of the hernia defect, the developed approach takes into account the severity of axial displacement, cardia geometry, the state of the antireflux valve mechanism, and esophageal motility, enabling the development of a personalized surgical approach.

REFERENCES

- [1] Ablav E. E., Belyalova A. R., Ibragimova D. N. Nissen fundoplication – the "gold standard" of surgical treatment of hiatal hernia // *Scientific news*. - 2022. - No. 28. - Pp. 88-90.
- [2] Andreyanov A. R., Gankov V. A., Maslikova S. A., et al. Videolaparoscopic treatment of paraesophageal fixed combined gastrointestinal-gastric giant hiatal hernia // *Operative surgery and clinical anatomy (Pirogov Scientific Journal)*. - 2022. - Vol. 6, No. 2. - Pp. 45-49.
- [3] Borodkin I. N., Demin D. B., Lyashchenko S. N., et al. Complications of laparoscopic interventions for hiatal hernia // *Endoscopic surgery*. - 2022. - Vol. 28, No. 1. - P. 57-64.
- [4] Ishchenko R. V., Sovpel I. V., Grintsov A. G., Sovpel O. V. Efficiency of using mesh implants in laparoscopic repair of hiatal hernia // *Surgical practice*. - 2020. - No. 1 (41). - P. 33-44.
- [5] Starkov Yu. G., Khizrieva I. N., Zamolodchikov R. D., Dzhantukhanova S. V. Experience with Collis-Nissen esophagogastroplasty for hiatus hernia and short esophagus // *Diagnostic and interventional radiology*. - 2024. - Vol. 18, No. 5. - P. 30-37.

- [6] Barratt O. A., Badenoch T., Findlay J. M. A systematic review of hiatus hernia classifications // Diseases of the Esophagus. - 2025. - Vol. 38, No. 3. - Article doaf044. Vol. 38. – P. 7179–7186.
- [7] Bauerle W., Franey D., Allsbrook A., et al. Retrospective cost analysis of robotic and laparoscopic antireflux surgery and paraesophageal hernia repair // Surgical Endoscopy. – 2024. –
- [8] Jaruvongvanich V. K., Matar R., Reisenauer J., et al. Hiatal hernia repair with transoral incisionless fundoplication versus Nissen fundoplication for gastroesophageal reflux disease: A retrospective study // Endoscopy International Open. – 2023. – Vol. 11, No. 1. – P. E11–E18.

Copyright © 2025 The Author(s). Published by Scientific & Academic Publishing

This work is licensed under the Creative Commons Attribution International License (CC BY). <http://creativecommons.org/licenses/by/4.0/>