QUALITY OF LIFE IN PATIENTS AFTER LAPAROSCOPIC FUNDOPLICATION FOR HIATAL HERNIA BASED ON GERD-HRQL QUESTIONNAIRE DATA

S.I. Ismailov[1,2], R.E. Ligai[1,2], A.D. Abdukarimov[1], A.O. Tsoy[1], R.R. Omonov[1], Sh.N. Madrakhimov[1], Zh.M. Avalbaev[1], S.D. Iskandarov[1]
State Institution "Republican Specialized Scientific-Practical Medical Center of Surgery named after Academician V.V. Vakhidov", Tashkent, Uzbekistan[1]
Tashkent State Medical University[2]
https://doi.org/10.5281/zenodo.20266881

Abstract. *To assess the dynamics of quality of life in patients operated on for hiatal hernia (HH) using an original modified laparoscopic fundoplication technique, applying the GERD-HRQL questionnaire within up to 1 year after surgery. From October 2023 to February 2025, 149 patients with HH types I–IV were operated on using the modified laparoscopic technique. Quality of life was assessed using the GERD-HRQL questionnaire before surgery and at 1, 6, and 12 months after surgery. In addition, patient complaints during the postoperative period were analyzed. The baseline mean GERD-HRQL score was approximately 20.1. At 1 month after surgery, it decreased to 3.13 (−84.4% from baseline), at 6 months to 7.65, and at 1 year to 8.55 (−57.5%). The follow-up coverage at 1 year was 75.8%. At discharge, 92.6% of patients had no complaints. Dysphagia (4.7%) was transient and resolved spontaneously. In some patients with periodic heartburn in the long-term period, the symptoms did not require repeat intervention and were corrected by PPI administration. Early HH recurrence (1.3%) was diagnosed during the period of mastering the technique and was resolved by repeat laparoscopic intervention.*

Keywords: *hiatal hernia, quality of life, GERD-HRQL, laparoscopic fundoplication, antireflux surgery, dysphagia.*

INTRODUCTION

Assessment of health-related quality of life is an integral component of analyzing the effectiveness of surgical treatment of hiatal hernias (HH) and gastroesophageal reflux disease (GERD). Elimination of the anatomical defect and elimination of reflux find their final expression not only in objective indicators — radiological consistency of the repair or pH-metry data — but, above all, in the patient's subjective perception of treatment results. That is why international surgical societies recommend the use of validated quality of life assessment tools as a mandatory criterion of the effectiveness of antireflux operations [1, 2].

The most widely used tool in this area is the GERD-HRQL questionnaire (Gastroesophageal Reflux Disease — Health-Related Quality of Life), developed specifically to assess GERD symptoms and their impact on daily life [3]. The questionnaire contains 10 questions, with a total score ranging from 0 (no symptoms) to 50 (maximum severity). A reduction in the total score by at least 50% from the baseline level is considered a clinically significant improvement [3]. Ease of application, high reproducibility, and sensitivity have made GERD-HRQL a standard instrument in studies on HH surgery.

Since October 2023, an original modified laparoscopic fundoplication technique, performed for HH of all types, has been introduced in the Department of Esophageal and Gastric

Surgery of the State Institution “Republican Specialized Scientific-Practical Medical Center of Surgery named after Academician V.V. Vakhidov.” The key elements of the technique that directly affect patient quality of life are: performing fundoplication in all types of hernia, providing complete antireflux protection; extended mediastinal mobilization of the esophagus, eliminating tension in the repair zone; the use of a 56–60F calibration probe and the “shoeshine maneuver,” preventing a hyperfunctional cuff and postoperative dysphagia.

The aim of the present study is to evaluate the dynamics of patient quality of life using the GERD-HRQL questionnaire after laparoscopic fundoplication by the modified technique within an observation period of up to 1 year.

MATERIALS AND METHODS

The study included 149 patients with HH types I–IV operated on in the Department of Esophageal and Gastric Surgery of the State Institution “Republican Specialized Scientific-Practical Medical Center of Surgery named after Academician V.V. Vakhidov” from October 2023 to February 2025 using the original modified laparoscopic Nissen fundoplication technique. Among the operated patients, there were 47 men (31.5%) and 102 women (68.5%), with a mean age of 54.8±15.7 years. Distribution by HH types: Type I — 74 (49.7%), Type II — 12 (8.1%), Type III — 59 (39.6%), Type IV — 4 (2.7%).

Quality of life was assessed using the GERD-HRQL questionnaire before surgery and at follow-up examinations at 1, 6, and 12 months after the intervention. At each visit, patient complaints were additionally recorded. To assess the clinical significance of the dynamics, the criterion of a reduction in the total score by at least 50% from the baseline level was used [3].

Statistical data processing was performed using the SPSS Statistics package. The Wilcoxon test for paired samples was used to compare indicators in dynamics; the level of statistical significance was set at $p<0.05$.

RESULTS

Baseline quality of life

Before surgery, the mean total GERD-HRQL score for the entire group was approximately 20.1, which corresponds to moderately pronounced symptoms. The distribution of baseline indicators by HH types is presented in Table 1. The highest score was recorded for Type I hernia (27.2), which naturally reflects the pronounced reflux component underlying this type. For Type II, the baseline score was significantly lower (6.8): in patients of this group, the clinical picture is dominated by mechanical symptoms (dysphagia, feeling of fullness), which are less reflected by the GERD-HRQL scale, since the scale is primarily focused on reflux symptoms. For Types III and IV, the mean values were 16.5 and 20.0, respectively, reflecting the combination of reflux and mechanical components.

Table 1. Baseline GERD-HRQL indicators by HH types (n=149)

HH Type	n	GERD-HRQL score (range)	Mean score
Type I	74	22–35	27.2
Type II	12	3–8	6.8
Type III	59	7–29	16.5
Type IV	4	9–31	20.0

HH Type	n	GERD-HRQL score (range)	Mean score
All	**149**	**–**	**~20.1**

Dynamics of quality of life after surgery

The dynamics of the mean GERD-HRQL score after surgery are presented in Tables 2 and 3, as well as in Figure 1. At all time points, a statistically significant decrease in the score compared with the baseline level was recorded ($p<0.001$).

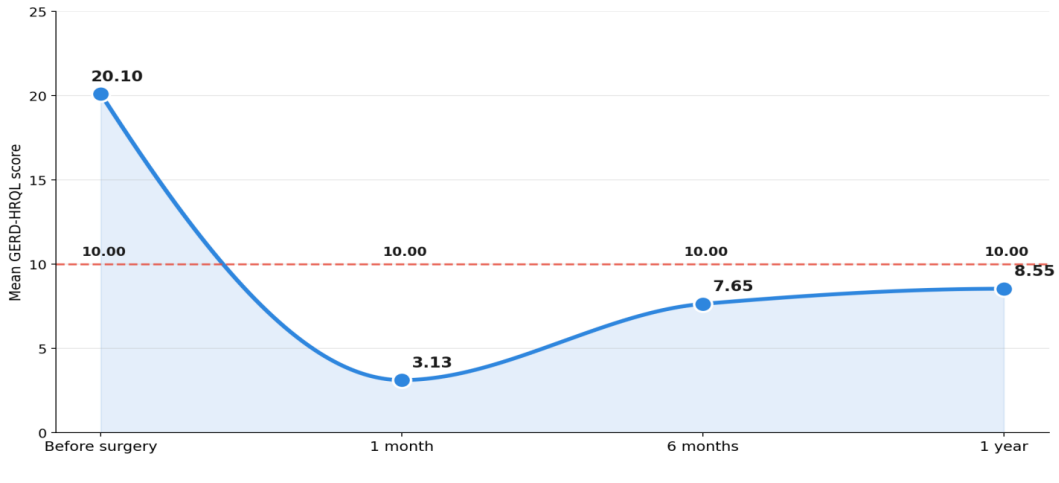
The most pronounced improvement in quality of life was already noted at 1 month after surgery: the mean score decreased from ~20.1 to 3.13, which corresponds to a reduction of 84.4% from the baseline level and significantly exceeds the threshold of clinically significant improvement (50%). The coverage of follow-up examinations at 1 month was 94.6% (141 of 149 patients), which ensures high representativeness of the data. The vast majority of patients during this period presented minimal symptoms or had no complaints at all.

By 6 months, the mean score was 7.65 (coverage 85.9%), and by 1 year — 8.55 (coverage 75.8%). Both values correspond to a mild degree of symptom severity and remain significantly below the baseline level. The slight increase in the score from the 1st to the 12th month (from 3.13 to 8.55) is physiologically explainable and reflects the normal course of the postoperative period: adaptation of the fundoplication cuff, restoration of normal esophageal peristalsis, and the patient's adaptation to the new anatomical conditions.

Table 2. Dynamics of the mean GERD-HRQL score (n=149)

Time point	n examined	% coverage	Range	Mean score	Δ from baseline
Before surgery	149	100%	–	~20.1	–
1 month	141	94.6%	0–6	3.13	−84.4%
6 months	128	85.9%	2–9	7.65	−61.9%
1 year	113	75.8%	2–17	8.55	−57.5%

Figure 1. Dynamics of mean GERD-HRQL score after laparoscopic fundoplication (n=149)



** score reduced by 84.4% at 1 month; dashed line — threshold of clinically significant improvement (≤10.0 points)*

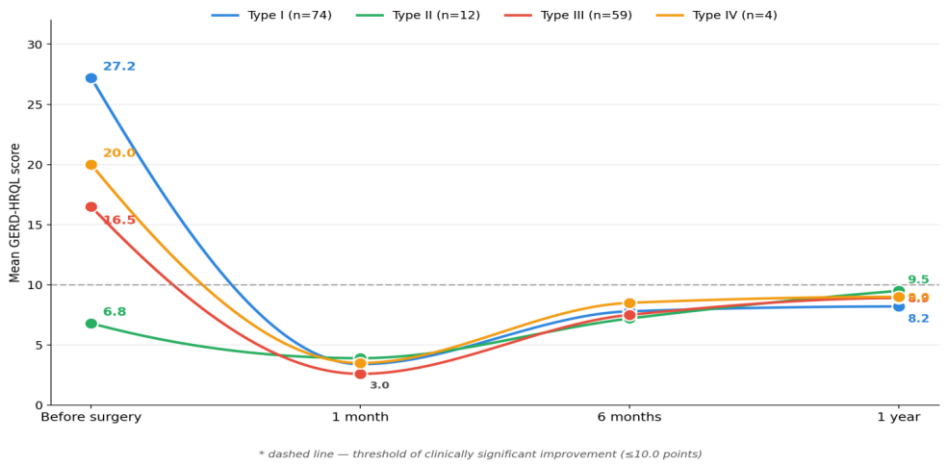
Dynamics by HH types

Analysis of GERD-HRQL dynamics by HH types revealed a uniform pattern across all groups: a sharp decrease in the score by 1 month with subsequent stabilization (Table 3). The greatest absolute reduction in the score was recorded for Type I (from 27.2 to 3.4 at 1 month) due to the initially most pronounced reflux symptoms. For Type II, the initially low score (6.8) decreased to 3.9 by 1 month and increased somewhat by 1 year (9.5), which reflects adaptation to the altered anatomical conditions after fundoplication in patients with predominantly mechanical symptoms. For Types III and IV, the dynamics are similar to Type I: pronounced early improvement followed by stabilization at the level of mild symptoms.

Table 3. Mean GERD-HRQL score by HH types in dynamics

HH Type	Before surgery	1 month	6 months	1 year
Type I (n=74/72/67/61)	27.2	3.4	7.8	8.2
Type II (n=12/11/8/5)	6.8	3.9	7.2	9.5
Type III (n=59/55/51/46)	16.5	2.6	7.5	8.9
Type IV (n=4/3/2/1)	20.0	3.5	8.5	9.0

Figure 2. Dynamics of mean GERD-HRQL score by HH types



Patient complaints in the postoperative period

The distribution of complaints at discharge from the hospital is presented in Table 4. The vast majority of patients — 138 of 149 (92.6%) — did not present any complaints at discharge. In some patients, periodic heartburn was noted in the long-term observation period; however, it did not reach the degree of severity requiring repeat surgical intervention and was successfully corrected by the administration of proton pump inhibitors (PPIs) in standard doses. This circumstance reflects normal adaptation in the postoperative period and does not indicate failure of the antireflux mechanism. Early HH recurrence was diagnosed in 2 patients (1.3%) within the first 2–3 days after surgery. The most probable cause was insufficient mobilization of the esophagus during the initial period of mastering the technique. Both patients underwent repeat

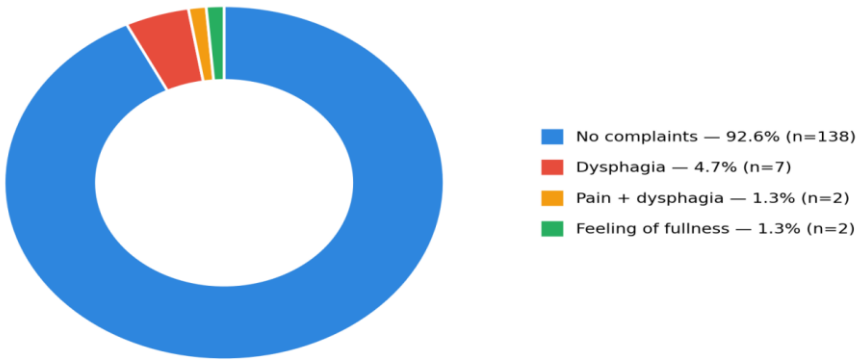
laparoscopic intervention consisting of additional esophageal mobilization and vagotomy, with a satisfactory immediate result. As surgical experience accumulated and the technique was standardized, this complication did not recur.

Dysphagia was noted in 7 patients (4.7%), and in 2 more (1.3%) — in combination with pain syndrome. In all cases, dysphagia was transient and resolved spontaneously without additional interventions. This is a direct consequence of the use of the 56–60F calibration probe during cuff formation and of the performance of the "shoeshine maneuver": these technical elements prevent excessive narrowing of the cuff and provide physiological pressure on the esophagus in the early postoperative period. A feeling of fullness without dysphagia was noted in 2 patients (1.3%) and also resolved spontaneously.

Table 4. Patient complaints at discharge (n=149)

Complaints	**n**	**%**
No complaints	**138**	**92.6%**
Dysphagia (transient)	7	4.7%
Pain + dysphagia	2	1.3%
Feeling of fullness	2	1.3%
Periodic heartburn (corrected with PPI)	0	–*
Total with complaints	**11**	**7.4%**

Figure 3. Structure of patient complaints at discharge (n=149)



DISCUSSION

The obtained results indicate the high effectiveness of the modified laparoscopic fundoplication with regard to the quality of life of patients with HH. A reduction in the mean GERD-HRQL score by 84.4% at 1 month and stabilization at the level of 8.55 at 1 year exceed the threshold values of clinically significant improvement (≥50%) and correspond to the results of leading world centers of antireflux surgery [4, 5].

The issue of postoperative heartburn deserves special attention. In some patients in the long-term period, periodic heartburn was observed that did not require repeat surgical intervention and was successfully relieved by the administration of proton pump inhibitors (PPIs). Such a pattern is characteristic of the transitional period after antireflux surgery and is due to the

adaptation of the lower esophageal sphincter to the new anatomical conditions. Performing fundoplication in all types of HH — including Types II–IV, for which the antireflux component was not previously envisaged in the department's practice — ensures a fundamentally more complete functional correction of lower esophageal sphincter pathology in the entire category of patients [6].

The transient and spontaneously resolving nature of postoperative dysphagia (4.7%) is a natural result of using a 56–60F calibration probe instead of the standard 40F. A number of international studies confirm that the use of larger-diameter probes when forming the fundoplication cuff reliably reduces the frequency and severity of postoperative dysphagia [7]. An additional control instrument is the "shoeshine maneuver," which allows intraoperative verification of the absence of excess gastric tissue behind the esophagus.

Some increase in the mean GERD-HRQL score from 3.13 (1 month) to 8.55 (1 year) is not a sign of recurrence, but rather reflects physiological adaptation — restoration of normal gastric secretion, resolution of postoperative edema, and the patient's adaptation to the altered anatomical conditions. Similar dynamics have been described in large case series after successful laparoscopic fundoplication [5].

High coverage of follow-up examinations (94.6% at 1 month, 75.8% at 1 year) is an independent indicator of the quality of medical care and ensures the high representativeness of the obtained data.

CONCLUSION

The modified laparoscopic fundoplication provides a pronounced and lasting improvement in the quality of life of patients with HH according to the GERD-HRQL questionnaire. The mean score decreased from ~20.1 to 3.13 at 1 month (−84.4%) and stabilized at the level of 8.55 at 1 year (−57.5%), which corresponds to clinically significant improvement at all follow-up periods. Periodic heartburn, noted in some patients in the long-term period, did not require repeat intervention and was corrected by the administration of PPIs. Dysphagia in 4.7% of cases was transient and resolved spontaneously, which confirms the correctness of using the 56–60F calibration probe and the "shoeshine maneuver." Early HH recurrence (1.3%), which occurred during the period of mastering the technique, was resolved by repeat laparoscopic intervention with a satisfactory result.

The totality of the obtained data substantiates the use of the developed technique as an effective tool for improving the quality of life of patients with HH of all types in a specialized surgical hospital setting.

REFERENCES

1. Daly S. et al. SAGES guidelines for the surgical treatment of hiatal hernias. Surg Endosc. 2024; 38(6): 2917–2938.
2. Hanna N.M. et al. Management of symptomatic, asymptomatic, and recurrent hiatal hernia: a systematic review and meta-analysis. Surg Endosc. 2024; 38(6): 2917–2938.
3. Velanovich V. The development of the GERD-HRQL symptom severity instrument. Dis Esophagus. 2007; 20(2): 130–134.
4. Dallemagne B., Weerts J., Markiewicz S. et al. Clinical results of laparoscopic fundoplication at ten years after surgery. Surg Endosc. 2006; 20(1): 159–165.
5. Khan M.U. et al. Outcomes of Laparoscopic Hiatal Hernia Repair: A Three-Year Follow-Up Study from a UK Tertiary Centre. Cureus. 2025; 17(10): e94404.

6. Singhal S. et al. Current Trends in the Management of Hiatal Hernia. Cureus. 2024; 16(11). DOI: 10.7759/cureus.73070
7. Pessaux P., Arnaud J.P., Delattre J.F. et al. Laparoscopic antireflux surgery: five-year results and beyond in 1340 patients. Arch Surg. 2005; 140(10): 946–951.