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ORIGINAL ARTICLE

Laparoscopic Interventions for Hiatal Hernia: Analysis of 51 Consecutive Cases

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Abstract

Introduction: Studies on the detection of benign causes of dysphagia and swallowing disorders have been blended with the current technology, and thus, serious advances have been made in determination of etiology of eating disorders. The most common of these are hiatal hernias, and there have been significant improvements in both understanding the pathophysiology of the disease and its treatment. In this study, we aimed to evaluate the results of 51 cases who underwent laparoscopic repair due to hiatal hernia in light of the literature.

Methods: Between September 2011 and October 2014, laparoscopic Nissen and Toupet fundoplication operations performed by a single general surgeon for gastroesophageal reflux and hiatal hernia in SBU Ümraniye Training and Research Hospital, Department of General Surgery, were included retrospectively in this study. Demographic characteristics, complaints, comorbidities, type of hiatal hernia, previous operation, and early and late post-operative complication parameters of each case were evaluated. The results were evaluated in percentage analyses with SPSS v21 for Windows and presented with tables and graphs.

Results: Fifty-one patients who underwent Nissen and Toupet fundoplication operations were included in the study. The mean age of all patients was 50.61±1.62 years. The mean ages of 23 male and 28 female patients were 48.30±2.69 years and 52.5±1.93 years, respectively. All but one patient underwent Nissen fundoplication. The time from diagnosis to surgery was 440.50±128.30 days. Post-operative hospital stay was 2.24±0.28 days. Four patients developed intraoperative (pleural defect in two patients, one liver injury, and one subcutaneous emphysema), and one patient developed early post-operative complications (postoperative atelectasis). In the 6th month control endoscopy, one patient had recurrence and the other patients had no pathology.

Discussion and Conclusion: Hiatal hernia is a common benign pathology that decreases quality of life. We believe that laparoscopic surgical repair is an effective method that can be safely applied after enough experience.

Keywords: Complication; hiatal hernia; nissen fundoplication.

Nutrition is one of the basic needs for the continuation of life, and mechanical and physiological disorders affecting nutrition have come to the fore in the last century. In terms of historical process, a breakthrough was made after Billroth's definition of new surgical principles in ulcer pathogenesis after the 1800s. Although advances have been made in the gastrointestinal system cancers in the following years, benign causes of this have also started to be revealed, especially in the 20th and 21st century. Studies on benign causes have been blended with existing technology, and serious progress has been achieved in today's psychological, physiological, and mechanical etiology of eating disorders. Functional disorders in the lower esophagus were better elucidated by defining groundbreaking methods in this regard, such as pH meter, manometer, and upper GIS endoscopy, especially for the examination of structural disorders. Although diseases such as achalasia and nutcracker esophagus have a wider place in the medical literature, hiatal hernia, which negatively affects the quality of life, is the most common structural disorder that

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can mimic other pathologies in the diagnostic process[1,2]. This structural defect, which occurs at the basis of different etiologies, is defined as the displacement of the stomach and other abdominal internal organs from the normal anatomic locations in the intra-abdominal area through the enlarged esophageal diaphragmatic hiatus toward the mediastinum. In its etiology, there are pathologies such as constipation, cough due to chronic obstructive pulmonary disease, pregnancy, and obesity, which are the reasons that increase intra-abdominal pressure. Hiatal hernias can be presented in four different ways based on penetration in the classification, and Type I hiatal hernia, also known as sliding hernia, is the most common type[1-4].

After the diagnostic process, laparoscopic repair has become the preferred surgical approach in hiatal hernia by reducing perioperative morbidity and shortening the duration of hospital stay[4]. However, the demonstration that recurrence rates can reach 42% in the evaluation made by X-ray and endoscopy after laparoscopic repair, has brought many different surgical techniques to the agenda as an alternative[5,6]. In the light of this information, although there are discussions about surgical repair methods from time to time, it still remains the gold standard. In this study, we aimed to evaluate the results of patients who underwent fundoplication due to hiatal hernia in the light of the literature.

Materials and Methods

The results of laparoscopic Nissen fundoplication and Heller myotomy + Toupet fundoplication operation due to gastroesophageal reflux and hiatal hernia performed by a single general surgeon in the University of Health Sciences Umraniye Training and Research Hospital between September 2011 and October 2014 were retrospectively evaluated from the hospital registry system and patient files. In the hospital system, a total of 51 cases were documented by searching for "diaphragmatic hernia,""gastroesophageal reflux disease," and "fundoplication, laparoscopic surgery" terms. Demographic characteristics of each case such as age, gender, complaints, additional diseases, type of hiatal hernia, previous operation, diagnostic procedure, time from diagnostic procedure to surgery, amount, and duration of medication used, whether additional surgery was required during the operation, number of ports used, drain placement, post-operative length of stay, and early and late post-operative complications parameters were evaluated. The obtained results were evaluated in terms of percentage analysis in SPSS v21 program for Windows, and the results were presented in tables and graphs.

Results

Fifty-one patients who underwent laparoscopic Nissen fundoplication and Heller myotomy + Toupet fundoplication for gastroesophageal reflux diseases and hiatal hernia between September 2011 and October 2014 by a single general surgeon in the University of Health Sciences Umraniye Training and Research Hospital were included in the study. When the cases were evaluated in terms of age and gender, the mean age of all patients was 50.61±1.62 years (Fig. 1), the mean age of 23 male patients was 48.30±2.69 years, and the mean age of 28 female patients was 52.5±1.93 years (Table 1 and Fig. 2).

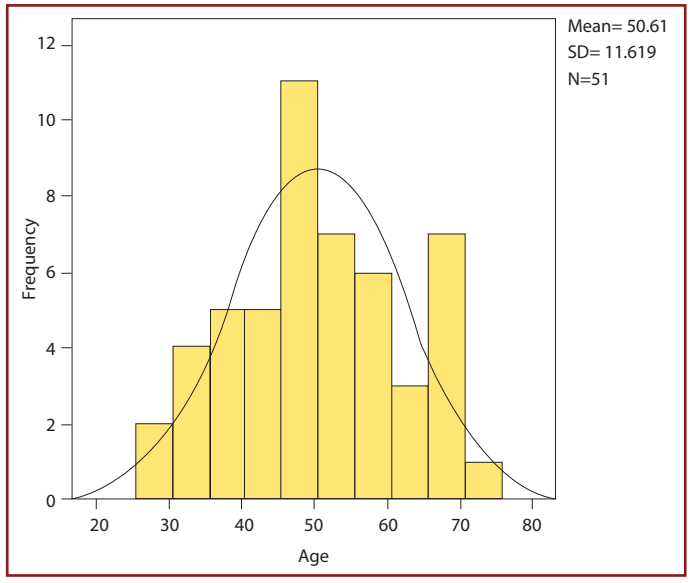

Figure 1. Age distribution of all patients.

Table 1. Demographic data of patients

Characteristics	Median
Age	50.61±1.62
Male	48.30±2.69
Female	52.5±1.93
Gender (%)	
Male	23 (45.1)
Female	28 (54.9)
Hospital stay (days)	2.24±0.28
Time from diagnosis to surgery (days)	440.5±128.30
Complication (%)	
Intraoperative	4 (7.6)
Early term	1 (1.9)
Late term	1 (1.9)
Hernia type (%)	
Type 1 (sliding)	42 (82.4)
Type 2 (paraesophageal)	6 (11.8)
Type 3 (mixed)	3 (5.9)

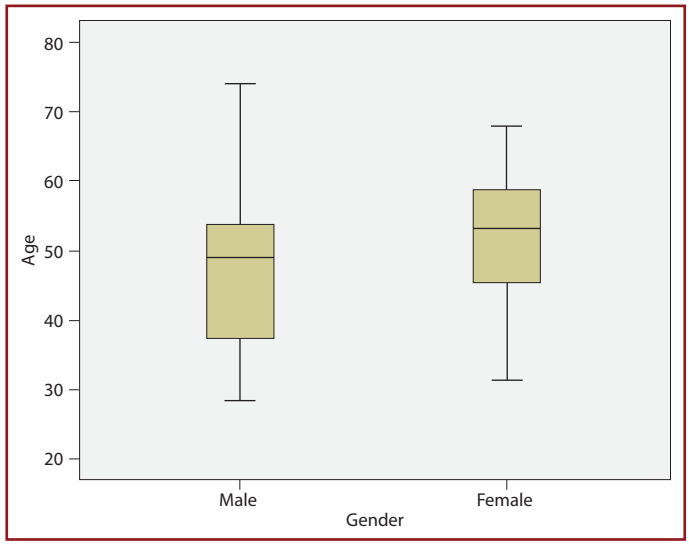

Figure 2. Age distribution in terms of gender.

While 42 of the patients had sliding hiatal hernia, 6 had paraesophageal hiatal hernia, and 3 had mixed type hiatal hernias (Fig. 3). Nissen fundoplication was performed in all cases except one. The mean duration from diagnosis to surgery was 440.50±128.30 days (Fig. 4). All patients were operated with four ports. Drains were placed in four patients. The mean post-operative hospital stay of the patients was 2.24±0.28 days (Fig. 5). Simultaneous operation was performed in seven patients. Of these patients, three patients underwent simultaneous cholecystectomy and four patients underwent hernioplasty operation (Table 2). While intraoperative complications developed in four patients (pleural defect in two patients, liver injury, and subcutaneous emphysema), early period (post-operative atelectasis) in one patient, mortality developed on the

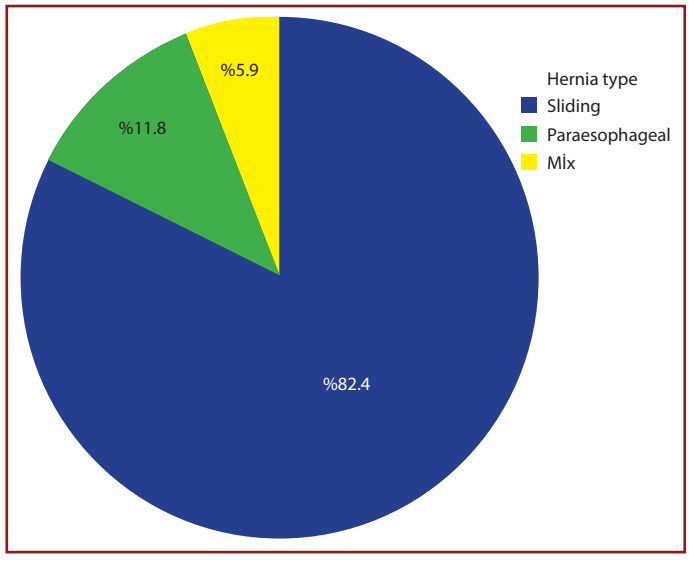

Figure 3. Types of hernia.

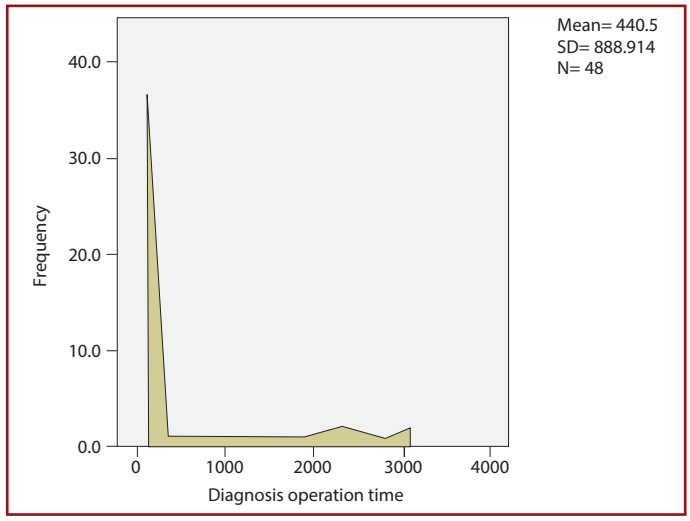

Figure 4. Diagnosis operation time.

2nd day due to post-operative cardiac cause in one patient (Table 3). In the control endoscopies performed at 6 months, recurrence was detected in one patient and no pathology was found in the other patients.

Discussion

A hiatal hernia is defined as the displacement of the stomach and other intra-abdominal organs from their intraperitoneal locations to the mediastinum through the dilated esophageal diaphragmatic hiatus. The most common causes in its etiology are constipation, chronic cough, pregnancy, and obesity that cause increased in-

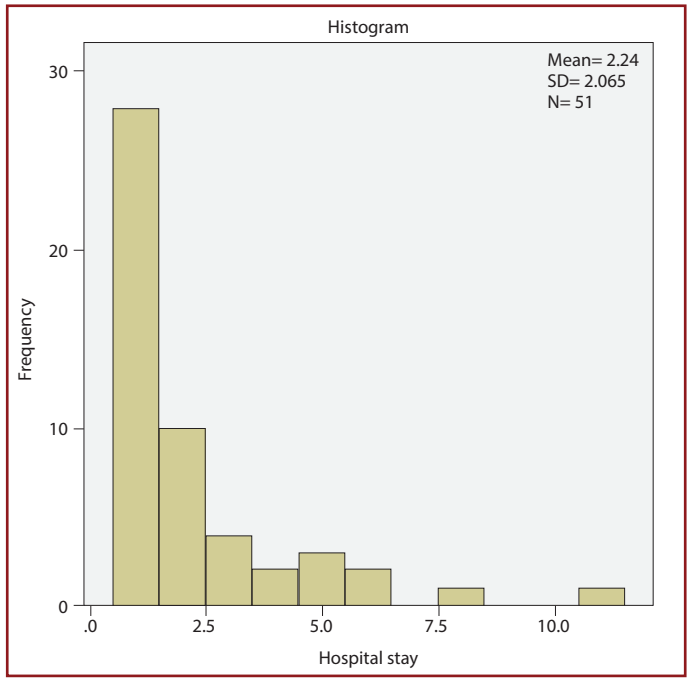

Figure 5. Length of stay in the hospital.

Table 2. Simultaneous operation

	n (%)
Cholecystectomy	3 (5.9)
Hernia repair	4 (7.9)
Epigastric hernia	1 (2)
Umbilical hernia	1 (2)
Inguinal hernia	2 (3.9)

Table 3. Post-operative morbidity assessment

	n (%)
Intraoperative	4 (7.6)
Pleural defect	2 (3.8)
Liver ınjury	1 (1.9)
Subcutaneous emphysema	1 (1.9)
Early period	
Atelectasis	1 (1.9)
Late period	
Recurrence	1 (1.9)

tra-abdominal pressure[1]. Hiatal hernias are divided into four groups according to the penetration of the hernia. In Type I hiatal hernia (sliding hernia), the distal esophagus and stomach are displaced toward the intrathoracic cavity. It is the most common type (85–95%). In this type, the stomach preserves its longitudinal placement, while the fundus slides under the gastroesophageal junction. Paraesophageal hernia (Type II hiatal hernia) is less common and there is a herniation of the stomach into the thoracic cavity. While the gastroesophageal junction maintains its normal anatomical position, the fundus slides from the side of the esophagus into the thorax. In Type III hernia, as the hernia passing through the hiatus grows gradually, the phrenoesophageal membrane stretches and the gastroesophageal junction shifts over the diaphragm. In Type IV hiatal hernia, there is protrusion of other intra-abdominal organs such as colon, spleen, pancreas, and small intestine into the hernia sac from the large defect in the phrenoesophageal membrane (Fig. 6)[2,3]. A good history taking, followed by upper gastrointestinal system endoscopy is the first step in its diagnosis. Afterward, sphincter pressure and acid analyses with high-level examinations such as manometric and pH meters within the indication help the diagnosis. After the diagnostic process, nutritional recommendations and medical treatment are the standard approach, and surgical treatment is indicated in cases that negatively affect the quality of life and who are resistant to medical treatment, or in the case of paraesophageal hernia.

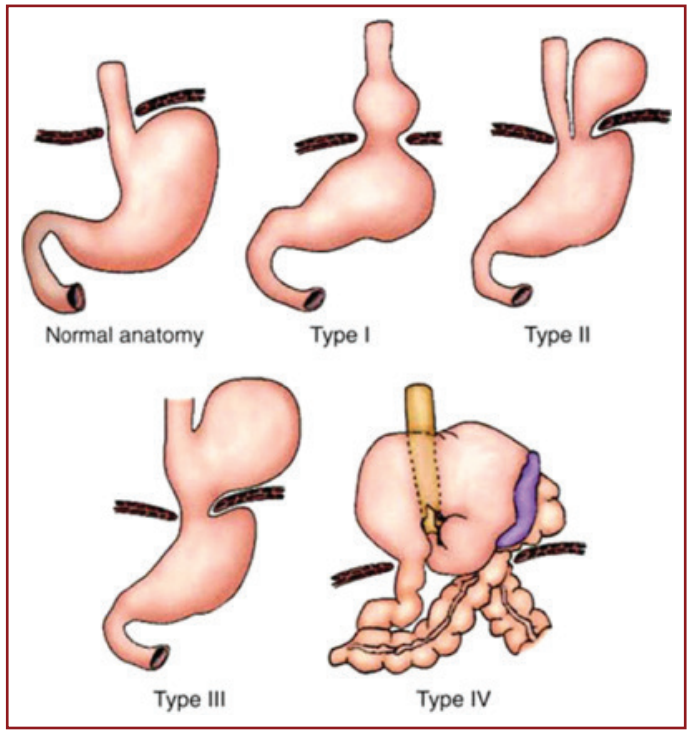

Figure 6. Types of hiatal hernia.[7]

The developments in laparoscopic surgery in the past 20 years have enabled it to be used more effectively and widely in the repair of hiatal hernia. The main advantage of the laparoscopic method is that a more painless and more comfortable surgery can be performed with the minimally invasive method, avoiding large incisions. Small incision results in early return to work and less hospital stay. Apart from patient comfort, it has drastically reduced the cost in countries such as the United States, where bed fees and hospital services are extremely expensive. There are also many studies showing the positive results of the laparoscopic method, such as shortening the duration of hospital stay and significantly reducing wound infection[8,9]. In the study of Chrysos et al.[8] comparing laparoscopic technique with open method, it was observed that patients were followed up in the hospital for 2–4 days after laparoscopic surgery. In our results, the length of stay in the hospital was 2.24 days, which is consistent with the literature.

In terms of complications, when the laparoscopic approach was first defined, complications such as severe bleeding, hollow organ injuries and perforations, stenosis, dysphagia, early recurrence, and pneumothorax were defined, and this rate has now become minimal with the surgeon's increasing experience and developments in laparoscopic instruments. Medical and invasive procedures have also been well defined in recent years for the man-

agement of complications that may develop. In the light of this information, laparoscopic hiatal hernia repair has become the preferred surgical approach by increasing patient comfort significantly[4]. However, there are also studies in the literature showing with X-ray and endoscopic evaluation after laparoscopic repair that recurrence rates may be high[5,6]. In the sources mentioned in terms of recurrence, it is stated that this rate can reach up to 40%. In our case series, while mortality developed in the early period due to myocardial infarction in one patient, minor complications developed in a few of our cases and these complications were controlled without the need for additional intervention.

Many laparoscopic methods have been described in hiatal hernia repair and reflux surgery, and Nissen fundoplication is still the most widely accepted type of operation. This method is to release the hernia sac at the hiatus and bring the esophagocardiac junction to its normal location, and to fix the prepared fundus by 360° rotating at the esophagocardiac junction. In recent years, mesh repairs are often used in addition to this method. Another application is robotic surgery. In a study by Schmitz et al.[10] published in 2019, in a total of 18 patients, 7 men and 11 women, with a mean age of 58.5 years, robotic Nissen fundoplication was performed, and in two of them, return to laparoscopic surgery has been required. In another series comparing robot-assisted laparoscopic Nissen fundoplication with known laparoscopic Nissen repair methods, no difference was found between the two methods in terms of hospital stay and recurrence rates[11]. Although there are studies showing the positive results of the robotic method in the pelvis, especially in prostate and rectal surgery, no significant positive results in terms of fundoplication have yet been demonstrated, except for the comfort provided by Nissen fundoplication in suturing the fundus at the fundoplication stage. With these results, the laparoscopic method is shown to be highly advantageous compared to open surgery, and robotic or robot-assisted methods do not have a significant positive advantage.

Conclusion

Hiatal hernia is a common benign pathology that decreases the quality of life. In recent years, the superiority of laparoscopic surgery over open surgery has been proven by many studies and laparoscopic surgery has become the first method of choice. Considering that there may be comorbidities that may accompany in patients with hiatal hernia, we think that it can be safely applied by experts experienced in laparoscopic surgery.

Ethics Committee Approval: Retrospective study.

Peer-review: Externally peer-reviewed.

Authorship Contributions: Concept: A.Y.; Design: S.M.T., H.S.U.; Data Collection or Processing: A.Y.; Analysis or Interpretation: S.M.T., H.S.U.; Literature Search: H.S.U., S.M.T.; Writing: A.Y., S.M.T., H.S.U.

Conflict of Interest: None declared.

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References

1. Floch NR. Paraesophageal hernias: Current concepts. J Clin Gastroenterol 1999;29:6–7. [CrossRef]
2. Kahrilas PJ, Kim HC, Pandolfino JE. Approaches to the diagnosis and grading of hiatal hernia. Best Pract Res Clin Gastroenterol 2008;22:601–16. [CrossRef]
3. Yu HX, Han CS, Xue JR, Han ZF, Xin H. Esophageal hiatal hernia: Risk, diagnosis and management. Expert Rev Gastroenterol Hepatol 2018;12:319–29. [CrossRef]
4. Müller-Stich BP, Holzinger F, Kapp T, Klaiber C. Laparoscopic hiatal hernia repair: Long-term outcome with the focus on the influence of mesh reinforcement. Surg Endosc 2006;20:380–4.
5. Horgan S, Eubanks TR, Jacobsen G, Omelanczuk P, Pellegrini CA. Repair of paraesophageal hernias. Am J Surg 1999;177:354–8. [CrossRef]
6. Hashemi M, Peters JH, DeMeester TR, Huprich JE, Quek M, Hagen JA, et al. Laparoscopic repair of large type III hiatal hernia: Objective follow-up reveals high recurrence rate. J Am Coll Surg 2000;190:554–61. [CrossRef]
7. Duranceau A. Massive hiatal hernia: a review. Diseases of the Esophagus. 2016;29:350–66. [CrossRef]
8. Chrysos E, Tsiaoussis J, Athanasakis E, Zoras O, Vassilakis JS, Xynos E. Laparoscopic vs open approach for Nissen fundoplication. A comparative study. Surg Endosc 2002;16:1679–84.
9. Kiladze MA, Giuashvili ST, Kiladze MM, Elgandashvili DV. A comparative study of laparoscopic and open Nissen fundoplication for GERD in Georgia. Ann Ital Chir 2014;85:551–5.
10. Schmitz R, Willeke F, Darwich I, Kloeckner-Lang SM, Saelzer H, Labenz J, et al. Robotic-assisted nissen fundoplication with the senhance® surgical system: Technical aspects and early results. Surg Technol Int 2019;35:113–9.
11. Hambraeus M, Arnbjörnsson E, Anderberg M. A literature review of the outcomes after robot-assisted laparoscopic and conventional laparoscopic Nissen fundoplication for gastro-esophageal reflux disease in children. Int J Med Robot 2013;9:428–32. [CrossRef]