

# Laparoscopic Approach to Repair Hiatal Hernias: Our Experience in a Tertiary Care Hospital

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## ABSTRACT

**Introduction:** Hiatal hernia is commonly associated with the symptomatic gastroesophageal reflux disease (GERD). Protrusion of any abdominal structure other than the esophagus into the thoracic cavity through the hiatus of the diaphragm. The relationship between hiatal hernia and gastroesophageal reflux and proposed surgical options to correct the defect as established by the Allison, namely returning the stomach to the abdomen and repairing the diaphragmatic hiatus. Proton pump inhibitors are a preferred treatment option for symptomatic relief. Surgical treatment usually follows medical treatment. Depending on the severity of symptoms and type of hernia involved, surgical treatment is decided. Laparoscopic repair is a good approach nowadays. It offers various benefits to both the patient and the surgeon. It is generally performed by a general abdominal surgeon because it usually involves an abdominal approach. Laparoscopic repair significantly decreases postoperative complications and is the procedure of choice in most centers.

**Materials and methods:** The present study protocol was reviewed and approved by the Institutional Review Board of Hospital, which waived the requirement for informed patient consent based on the retrospective nature of the work. A single team of surgeon performed all the procedures. Eighteen patients with primary hiatal hernia who underwent laparoscopic surgery from 2016 to 2018 were examined.

**Results:** The follow-up period was between 12 months and 24 months. The average follow-up period was around 18 months.

- Thirty-nine patients underwent laparoscopic hernia repair with fundoplication, of which 26 were females and 13 males.
- Most of the patients present with symptoms of heartburn or epigastric pain. Some of the patients presented with dyspepsia. Few patients were diagnosed incidentally.
- The average age was 42 years (25–75).
- Operative time was 150–250 minutes with a mean time of 194 minutes. No patient needed conversion from laparoscopic procedure to open technique.
- The hospital stay was 4–7 days with an average stay of 4.5 days. These included one-day preoperative admission.
- There were no deaths during or after the procedure.
- *Pain:* A total of 15 patients complained of pain on post-op day 1 who needed round-the-clock analgesia. This number fell to 5 by day 3. At the time of discharge (maximum interval being 7 days and median being 5.5 days), none of the patients had complaints of pain.
- Two patients had symptoms of dysphagia at the outpatient follow-up. These patients showed no notable findings on imaging examination and no difficulties with feeding, the symptoms were well-controlled with medication.

**Conclusion:** We conclude that laparoscopic repair of hiatal hernia is a feasible technique with satisfactory surgical outcomes. Although it is a complex operation with a substantial learning curve, thoracic surgeons who have adequate experience with laparoscopy would be capable of performing the operation.

**Keywords:** Esophagogastroduodenoscopy, Gastroesophageal junction, Gastroesophageal reflux disease, Hiatus hernia, Laparoscopy.

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## INTRODUCTION

Hiatus hernia is the bulging of an abdominal structure other than the esophagus into the chest cavity through the hiatus of the diaphragm. Hiatal hernia is often associated with symptomatic GERD.<sup>1</sup> The relationship between hiatal hernia and gastroesophageal reflux and proposed surgical options for correcting the defect, as noted by Allison, namely, returning the stomach to the abdomen and repairing the diaphragmatic hiatus.<sup>2</sup> The GEJ to become intrathoracic consists of a combination of hiatus enlargement, lengthening of the phrenoesophageal ligament, and increased intra-abdominal pressure. There are four types of hiatal hernia. Type I, sliding hiatal hernias, make up almost 95% of all hiatal hernias. The other three types of hiatal hernias are broadly classified as paraesophageal. Compared to a type I hernia, which does not have a hernial sac, all PEHs are covered all around by a peritoneum layer, which forms a real hernial sac. Type II PEH is the rarest.<sup>3,4</sup>

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It is difficult to determine the actual incidence of a hiatal hernia because an asymptomatic hiatal hernia often goes undetected. However, the symptomatic hernia associated with GERD should be examined pathophysiologically, as the incidence of GERD is increasing worldwide.<sup>5</sup> Compared to the West, the East has the

lower incidence, but recently the incidence is increasing in our part of the world.<sup>6</sup>

Proton pump inhibitors are a preferred treatment option for symptom relief. Surgical treatment is usually followed by medical treatment. Depending on the severity of symptoms and the type of hernia affected, surgical treatment will be decided.<sup>7,8</sup> Surgical reconstruction of the paraesophageal hernia has two main goals: to restore normal anatomy by returning the GEJ and stomach to the abdomen and to correct the condition that contributed to the development of the anatomical problem, GERD. There are several approaches to the surgical treatment of paraesophageal hernias; a transthoracic, transabdominal, or laparoscopic approach.<sup>9-11</sup>

Laparoscopic repair is a good approach these days. It offers various advantages to both the patient and the surgeon. It is generally performed by a general abdominal surgeon as it usually involves abdominal access. Laparoscopic repair significantly reduces postoperative complications and is the procedure of choice in most centers.

## MATERIALS AND METHODS

The present study protocol was reviewed and approved by the Institutional Review Board of Hospital, which waived the requirement for informed patient consent due to the retrospective nature of the work. A single team of surgeons performed all of the interventions. Eighteen patients with primary hiatal hernia who underwent laparoscopic surgery from 2009 to 2017 were examined. Routine preoperative tests were performed (e.g., physical exam, standard laboratory tests, and pulmonary function tests). In addition, an esophagogastroduodenoscopy, computed tomography of the thorax and abdomen, and barium esophagography were performed preoperatively. However, esophageal manometry and 24-hour ambulatory pH monitoring were not performed routinely. The indications for surgery were the presence of symptoms (reflux or obstructive symptoms) and the patient's desire for surgical repair and consent. The latter was generally true of asymptomatic cases discovered by chance. Consent to the operation was obtained from the patients after they had been adequately educated about the natural course of an untreated hiatal hernia and informed about the operation, including details of the procedure and the associated risks. Based on the postoperative clinical stability of each patient, feeding was started after it was confirmed that no abnormalities occurred. Patients who showed no symptoms on the oral soft diet were discharged. All patients visited the outpatient department 2 weeks postoperatively for a general check of their condition and symptoms. Follow-up examinations were carried out every 3 months for the first year and every 6 months thereafter. In this study, clinical features, surgical factors, and postoperative outcomes were analyzed for all patients.

### Operative Technique

All patients were treated laparoscopically. The details were described in previous MIES studies.<sup>7,12</sup> The operative procedure was similar to that of Schlottmann F, et al.<sup>7</sup> Five trocars with a 30° angled camera and a liver retractor were used.

The procedure was completed with the following steps: First, a hernial sac dissection was performed. Intra-abdominal esophagus was mobilized and a tension-free length of not less than 2 cm. Then the crura were approximated with simple single-button sutures. Most recently, Nissen (360°) fundoplication was performed. No gastropexy was performed.

## RESULTS

The follow-up period ranged from 12 months to 24 months. The mean follow-up time was about 12 months.

- In total, 39 patients underwent laparoscopic hernia surgery with fundoplication, including 26 women and 13 men (Table 1).
- Most patients present with symptoms of heartburn or epigastric pain. Some of the patients presented with dyspepsia. Few patients were diagnosed by chance.
- The mean age was 42 years (25–75) (Table 2).
- The operating time was 150–250 minutes with an average time of 194 minutes. No patient required a switch from the laparoscopic procedure to the open technique (Table 3).
- The hospital stay was 4–7 days with an average stay of 4.5 days. This included a one-day preoperative admission.
- There were no deaths during or after the procedure.
- *Pain*: A total of 15 patients complained of pain on the 1st postoperative day that required analgesia around the clock. This number decreased to 5 by day 3. At the time of discharge (maximum interval of 7 days and median 5.5 days), none of the patients was in pain.
- Two patients had symptoms of dysphagia at the outpatient follow-up visit. These patients showed no significant imaging findings and no difficulty in eating, and the symptoms were well controlled with medication.

## DISCUSSION

The presentation of the hiatal hernia can be very different, it can be asymptomatic, or it can appear with different symptoms such as reflux or obstructive symptoms. Diagnosing hiatal hernia is difficult, but with the advent of new diagnostic tools, the rate of diagnosis has recently increased.<sup>12,13</sup> Because of the morbidity and effectiveness associated with open surgery, medical treatment is the preferred approach to control symptoms of GERD.<sup>14</sup> But since the introduction of laparoscopic surgery, the morbidity

**Table 1:** Sex ratio of the patient

S. no.	Sex	No. of patients	Percentage (%)
1	Male	13	33.33
2	Female	26	60.66
	Total	39	100

**Table 2:** Age distribution of patients

S. no.	Age-group	No. of patients	Percentage
1	25–35	5	12
2	36–45	11	27.5
3	46–55	9	22.5
4	56–65	5	12.5
5	66–75	4	10

**Table 3:** Duration of surgery

Time in mins	No. of cases
150–200	24
201–250	15

associated with the procedure has decreased dramatically. Various studies have concluded that the laparoscopic approach is just as effective as open surgery, but with reduced postoperative complications, recovery time, and almost the same recurrence rates.<sup>15</sup> In addition, several studies have shown that laparoscopic surgery is the medical treatment in terms of long-term symptomatic improvement and cost-effectiveness.<sup>16–18</sup> Regarding asymptomatic patients, some suggest waiting and observing. However, experts believe that asymptomatic hiatal hernias are rare and studies have shown a progression from asymptomatic to symptomatic about 14% per year.<sup>19</sup> The minimally invasive approach to repairing paraesophageal hernias is now the preferred approach because of the lower incidence of morbidities, less pain, and longer hospital stay compared to the open approach.<sup>15,20</sup> The recurrence rate of the laparoscopic approach is similar to that of the open approach and has decreased over time with increasing experience and better learning of the technique.<sup>21</sup>

The SAGES set out the technical considerations for surgery in their 2013 guidelines for the management of hiatal hernias.<sup>22</sup> The infra diaphragmatic position of the gastroesophageal junction is one of the most important aspects of hernia repair. Collis gastroplasty is the answer to the short esophagus as suggested by O'Rourke et al. in their study.<sup>23</sup> None of the patients in our study required Collis gastroplasty. The complexity of hiatal hernia surgery requires a significant learning curve. Okrainec et al. reported that surgeons need at least 20 cases of experience to achieve a reasonably low recurrence rate.<sup>24</sup> We have been able to successfully carry out this operation to date without complications and without recurrences. The limitations of our retrospective study were the small sample size and the relatively short follow-up.<sup>25</sup>

## CONCLUSION

We conclude that laparoscopic repair of hiatal hernias is a viable technique with satisfactory surgical results. Although it is a complex operation with a significant learning curve, thoracic surgeons with sufficient experience in laparoscopy would be able to perform the operation.

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