

# Laparoscopic Paraesophageal Hernia Repair

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## ABSTRACT

**Background and Objective:** Paraesophageal hernias are uncommon yet potentially lethal conditions. Their repair has now been facilitated by laparoscopic technology. We present a series of 20 patients with paraesophageal hernias repaired laparoscopically.

**Methods:** Twenty patients with paraesophageal hernias had laparoscopic repairs. Eighteen patients had primary repair of their hiatal defect. Two required mesh reinforcement. Fifteen patients had a fundoplication procedure performed concomitantly.

**Results:** Long-term follow-up is available on 17 patients. There was no in-hospital morbidity or mortality. Average length of stay was 2.3 days. One patient recurred in the immediate postoperative period. There were no other recurrences. The only death in the series occurred in the oldest patient 18 days postoperatively. He had been discharged from the hospital and died of cardiac failure. No patients have had complications from a paraesophageal hernia postoperatively.

**Conclusion:** Laparoscopic repair of paraesophageal hernias is possible. Preoperative work-up should include motility evaluation to assess esophageal peristalsis as the majority of these will need a concomitant anti-reflux procedure. This data helps the surgeon to determine whether or not a complete or partial wrap should be done. Repair of the diaphragmatic defect can be accomplished in the majority of patients without the use of prosthetic material with excellent results.

**Key Words:** Paraesophageal, Nissen, Reflux, Laparoscopic.

## INTRODUCTION

Paraesophageal hernias (PEH) account for 5% of diaphragmatic hernias. Many patients with paraesophageal hernias present emergently with life-threatening complications such as gastric volvulus, strangulation and/or bleeding; therefore, elective repair of these hernias is strongly recommended upon diagnosis.<sup>1,2</sup> Since 1991, laparoscopic fundoplication has served to familiarize surgeons with the hiatal anatomy, and it was a natural extension to proceed with laparoscopic reduction and repair of PEH. There have been a number of preliminary reports published<sup>3-5</sup> recently regarding the technique of PEH repair and addressing the ongoing controversy as to whether an anti-reflux procedure should be routinely performed with the repair. We present two community surgeons' experience with the procedure and their follow-up.

## MATERIALS AND METHODS

From November 1993 to May 1997, 20 patients had laparoscopic reduction and repair of paraesophageal hernias. There were 9 women and 11 men (**Table 1**). Their ages ranged from 40 to 96. Preoperative work-up included upper gastrointestinal series (UGI) in 13 patients (65%), motility studies in 16 patients (80%) and esophagogastroduodenoscopy (EGD) in 18 patients (90%) (**Table 2**). All patients had a paraesophageal hernia confirmed either by UGI or EGD. Paraesophageal hernias were classified as Type II or Type III based on the position of the gastroesophageal junction relative to the diaphragm. Type II hernias had the gastroesophageal junction located at the diaphragmatic hiatus with the gastric fundus located above the diaphragmatic hiatus, and Type III hernias had both the gastroesophageal junction and the gastric fundus displaced cranially. Twelve hernias were pure Type II. Eight patients had Type III PEH. All patients who had preoperative symptoms of gastroesophageal reflux (GERD) and/or endoscopic evidence of GERD underwent laparoscopic fundoplication. If preoperative manometry demonstrated normal esophageal contractions, they had a Nissen fundoplication. If esophageal contractions were decreased, they had a Toupet—a 270 degree fundoplication—performed (**Table 3**).

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**Table 1.**

Patient Demographics.

Number of Patients	20
Age-Mean (Range)	60.2 (40-96)
Female/Male	9/11

**Table 2.**Work-up of Patients  
(All patients had either EGD or UGI).

EGD	18 (90%)
UGI	13 (65%)
Motility	16 (80%)

The patient was positioned in stirrups with the operator standing between the patient's legs. The ports were positioned as for a standard Nissen fundoplication. All ports were 12 mm. The dissection was begun by reducing the hernia contents into the abdomen and freeing the sac from its surrounding attachments. The Ultracision Harmonic Scalpel (Ethicon Endosurgery) was used to dissect, cut and coagulate the attachments to the sac. If the sac was unable to be removed from the chest, it was transected free from the abdominal viscera it contained so that the contents remained reduced in the abdomen without traction. In all cases the crura were primarily approximated using O Ethibond sutures. As noted earlier, individuals with GERD had fundoplication procedures performed as dictated by their preoperative manometry studies. This was performed as described in previous reports.<sup>6</sup>

All patients had nasogastric suction until the morning of postoperative day number one. After removal of the nasogastric tube, patients were begun on a liquid diet and discharged on liquids when tolerating oral intake.

Clinical follow-up occurred on patients at one and six weeks. Seventeen patients were available for telephone follow-up performed prior to this writing. Follow-up ranged from 6-48 months after surgery.

**Table 3.**

Type of Hernia and Treatment.

	PEH Repair Only	PEH Repair Plus Nissen	PEH Repair Plus Toupet
Type II (12)	5	5	2
Type III (8)	0	5	3
Total (20)	5	10	5

**Table 4.**OR Times (Patient in to / out of Room),  
OP Times (Skin Incision to Skin Closure),  
EBL (Estimated Blood Loss as Determined By  
Anesthesia),  
LOS (Length of Stay-Day of Surgery to Day of Discharge)

OR Time-Mean (Range)	207.25 (141-320)
OP Time-Mean (Range)	165.9 (101-285)
EBL-Mean (Range)	72.5 (50-300)
LOS-Mean (Range)	2.4 (1-5)

## RESULTS

All patients had their procedures completed laparoscopically. Operating time ranged from 100 to 285 minutes. Mean operating time was 166 minutes (**Table 4**). Fourteen patients had PEH repairs and fundoplication procedures. Six had only PEH repairs. For patients who had hernia repairs alone, mean operating time was 167 minutes. For the patients who had repair of their PEH and fundoplication procedures, mean operating time was 154 minutes. Ten patients had Nissen fundoplications and five had Toupet procedures. One patient had the repair reinforced with Gortex mesh and one had it reinforced with Marlex mesh. Two patients had G-tubes placed at the time of surgery and two others had gastropexy procedures along with their repairs. Blood loss was minimal or less than 100 cc in 13 patients, and the maximal blood loss was 300 cc. No patients required transfusion. There were no intraoperative complications. There was no in hospital morbidity

**Table 5.**

Results.

(Follow-up Not Available on Three Patients-  
One Early Death, Two Lost to Follow-up)

Patients	17
Mean Follow-up (Range)	20 Months (6-48)
Reflux SX Only	3
Dysphagia and Reflux	2
Recurrence	0

or mortality. Average length of stay was 2.4 days. Thirty-day morbidity was limited to one patient who recurred two weeks postoperatively. He subsequently underwent open repair and is doing well. There was one death in the oldest patient in the series, 18 days postoperatively. He had been discharged to a transitional care center and suffered a cardiac death. All other patients were doing well at six weeks. Long-term (greater than six weeks) follow-up is available on 14 patients (**Table 5**). Five patients reported subjective symptoms of reflux. Four of these patients had fundoplication procedures: three had Nissen wraps and one had a Toupet fundoplication. One patient known to have an esophageal web which was dilated preoperatively continues to have regurgitation. This patient and one other had persistent dysphagia and have required dilatation. Both of these individuals had wraps performed over 50 and 52 Fr. Bougies. Postoperative manometry was not performed in our patients because of reimbursement limitations. No complications following repair of a paraesophageal hernia are reported in patients for whom follow-up is available.

## DISCUSSION

Paraesophageal hernias remain a rare yet potentially lethal condition. Laparoscopic technology allows the repair of this defect with short hospital stays and excellent outcomes as reported in this and other series.<sup>4,5,7</sup>

Among the controversies in the management of PEH is the role of fundoplication. The need for fundoplication is sup-

ported in other series as they have documented a larger number of patients with objective evidence of GERD compared with those who present with subjective symptoms.<sup>8</sup> The incidence of GERD is higher in individuals after a PEH repair even if a fundoplication is performed (18 - 21%) as compared with individuals with GERD alone undergoing fundoplication. The authors now routinely perform fundoplication procedures with PEH repairs because of the objective measures of reflux reported in the literature in individuals with PEH and the extensive mobilization of the hiatal region required to reduce and repair PEH. Esophageal manometry is required to evaluate the fundoplication best suited for an individual's esophageal motility. This is especially important to prevent dysphagia in individuals with poor esophageal body contractions.

Another controversy in the management of paraesophageal hernia is the role of gastric fixation procedures such as gastropexy or gastrostomy tubes. Two patients in our series had gastrostomy tubes placed and two had gastropexy procedures performed. All four of these patients had fundoplication procedures performed as well. The decision to perform a gastric fixation procedure was based on concerns for the potential of gastric volvulus.

In our series, all defects were able to be closed primarily. Two repairs were reinforced with Gortex mesh. The mesh was cut in a horseshoe configuration and secured over the hiatus with a hernia stapler. There exists in the literature considerable debate as to the role of prosthetic materials used either selectively or on a routine basis to close the defect. Prospective data regarding this issue should be obtained prior to making definitive recommendation with regards to this issue. This is particularly true as new prosthetic materials continue to be developed.

In conclusion, our series supports the existing literature that laparoscopic repair of PEH is a technically feasible, beneficial procedure that confers the same benefits to the patient as other laparoscopic procedures. We recommend concomitant fundoplication as dictated by manometric studies in order to decrease the incidence of postoperative reflux. The authors recommend elective repair of PEH soon after diagnosis as the mortality of complications secondary to PEH is high.<sup>6</sup> Elective repair allows the optimization of the medical status of these patients who tend to be older and carry associated comorbid conditions.

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