Laparoscopic management of large hiatus hernia with mesh cruroplasty

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Abstract

Purpose Laparoscopy has become the standard surgical approach to surgery for gastrooesophageal reflux disease (GERD) and hiatal hernia repair with excellent long-term results and high patient satisfaction. However several studies have shown that hiatal hernia repair, especially large hiatus are associated with high recurrence rate. Mesh reinforcement has been proposed for repair of large hiatus hernia. The objective of this study was to evaluate the role of mesh cruroplasty in management of large hiatus hernia (> 5 cm).

Methods Between February 2002 to December 2007, 73 patients (28 men and 45 women) who underwent laparoscopic hiatal hernia repair with mesh cruroplasty were included in our study. Mesh reinforcement (cruroplasty) was used for repair of large hiatus hernia (>5 cms hernial defect). Mean age was 50.4 years (range 30–72 years). Follow up included barium swallow of patients at 3 months and yearly thereafter.

Results Seventy-three patients underwent mesh cruroplasty for large hiatus hernia. We were able to adequately mobilise the oesophagus to achieve an intra-abdominal length of at least 3 cm in all patients. Intraoperative complication rate was 8.21% (6/73), intraoperative complications included pleural tear, bleeding from splenic capsule laceration and short gastric vessels. Postoperative complication rate was 4.1% (3/73), which included complete dysphagia, atelactasis and pneumonia. Mean duration of hospitalisation was 3.5 days (range 3–9 days). Five patients (5/73) were lost to follow up. Four patients (5.8%) developed recurrence on routine follow up. No mesh related complications were noted on long-term follow up period. Mean follow up period was 3.2 years (range 5 months–6 years).

Conclusion Our data supports the use of mesh in hiatal hernia repair, especially in large hiatus hernia as it leads to low recurrence rates. Longer follow up and more randomised controlled trials are needed to establish laparoscopic mesh cruroplasty as standard technique for large hiatal hernia repair.

Keywords Hiatal hernia repair · Mesh reinforcement · Large hiatus hernia · Mesh cruroplasty · Recurrence

Introduction

Laparoscopic oesophageal surgery has gained popularity due to the unprecedented view of the oesophageal hiatus hernias and ease of access to the surgical site offered by the minimal access approach. Numerous series have demonstrated the safety and efficacy of approaching gastrooesophageal reflux disease (GERD) and hiatus hernia repair by the laparoscopic approach [1, 2]. Despite increasing experience with laparoscopic hiatal hernia repair, authors continue to report recurrence rate of up to 43% with sutured cruroplasty [3, 4]. This compares laparoscopic hiatal hernia repair poorly to open repair as it is well documented that open hiatal hernia repair with addition of Stamm gastrostomy is associated with very low recurrence rate [5, 6]. Addi-
ally, intrathoracic wrap migration rates up to 26% have been reported for patients undergoing laparoscopic fundoplication with primary sutured hiatal hernia repair [7]. Several technical details have been considered to minimise these high recurrence rates like excision of sac with complete detachment of sac from hiatus and mediastinum, adequate mobilisation of oesophagus with minimum of 3 cm of intra-abdominal oesophagus, use of mesh cruroplasty in patient with large hiatus hernia. The concept of using prosthetic materials is to achieve a tension free hiatal repair. The mesh may be used to close the gap between two widely spaced crura or to reinforce a suture cruroplasty.

The aim of the present study was to evaluate the effect of mesh reinforcement in laparoscopic hiatal hernia repair on recurrence rate and the side effects during long-term follow up.

### Patients and Methods

#### Patients

A total of 73 patients (28 men and 45 women) underwent laparoscopic mesh cruroplasty for large hiatus hernia (> 5 cm hernial defect) between February 2002 to December 2007 at Sir Ganga Ram Hospital, New Delhi, India, a tertiary referral centre for minimal access and bariatric surgery. It was a prospective cohort study. Mean age was 50.4 yrs (range 30–72 yrs). Out of these 73 patients, five patients had sliding hernia and 33 patients had paraoesophageal hernia and 35 patients had both sliding and paraoesophageal hernia.

#### Symptoms

Symptoms in patients with hiatus hernia vary greatly. The most common symptoms were heart burn (57.5%), regurgitation (49.3%) and epigastric pain (20.5%). Other symptoms included bleeding, dysphagia, recurrent aspiration as shown in Table 1.

#### Preoperative Investigation

Preoperative evaluation included a chest X-ray, upper gastrointestinal endoscopy, and barium swallow for all patients. Manometry and 24-hour pH monitoring were performed selectively. They were performed in those patients in whom symptoms did not correlate with endoscopic and radiological findings and patients who had mainly atypical symptoms. Manometry and 24-hour pH monitoring was performed in only 5 patients and results are shown in Table 2. Fluoroscopic evaluation provided a crude measure of oesophageal motility. The presence or absence of dysphagia was considered another reasonably sound predictor of whether the patient will tolerate complete wrap (Nissen fundoplication). Partial fundoplication is performed only in-patient with history of dysphagia and age >65.

#### Indications for Surgery

**Sliding hernia** Symptomatic patients (with GERD)  
**Paraoesophageal hernia** All patients were advised surgery to avoid potential risk of life threatening complications such as incarceration, volvulus, perforation and bleeding.

#### Surgical Technique

Our aims of surgery  
- Reduction of contents  
- Excision of sac  
- To achieve minimum of 3 cm intra-abdominal length of oesophagus  
- Division of short gastric vessels to mobilize gastric fundus  
- Prosthetic repair of crural gap in hiatus more than 5 cm wide  
- Short, floppy 360 degree wrap or partial wrap.

The procedure is performed under general anaesthesia with endotracheal intubation. Patient is placed in Reversed Trendelenburg position with knees slightly flexed. Surgeon stands between the legs; the camera assistant is positioned to the right of the patient and assistant surgeon to the left of the patient (Fig. 1).

The camera port (10 mm) is made above the umbilicus one-third the distance between the umbilicus and the epigastrum towards left of midline. Additional three 5 mm and one 10 mm ports are placed as shown in (Fig. 2). The 5 mm port in the epigastrum is used to retract the left lobe of liver using Nathanson’s liver retractor. The 5 mm port in the right midclavicular line and the 10 mm port in the left midclavicular line are the surgeon’s left and right hand working ports respectively.

Using atraumatic bowel graspers, the stomach is grasped and retracted and the contents from the hernial sac are

### Table 1 Symptoms of patients with large hiatus hernia

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Number</th>
<th>Percentage (%)</th>
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</thead>
<tbody>
<tr>
<td>Heart burn</td>
<td>42/73</td>
<td>57.5%</td>
</tr>
<tr>
<td>Regurgitation</td>
<td>36/73</td>
<td>49.3%</td>
</tr>
<tr>
<td>Epigastric pain</td>
<td>15/73</td>
<td>20.5%</td>
</tr>
<tr>
<td>Bleeding</td>
<td>7/73</td>
<td>9.5%</td>
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<tr>
<td>Dysphagia</td>
<td>5/73</td>
<td>6.8%</td>
</tr>
<tr>
<td>Aspiration</td>
<td>5/73</td>
<td>6.8%</td>
</tr>
<tr>
<td>Volvulus</td>
<td>3/73</td>
<td>4.1%</td>
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