Laparoscopic Nissen Fundoplication with Anterior Versus Posterior Hiatal Repair

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Abstract

Background: Postoperative dysphagia in patients after Nissen fundoplication might be related to the technique used for the closure of the esophageal hiatus.

Methods: A total of 18 patients with gastro esophageal reflux were randomized to undergo laparoscopic Nissen fundoplication with either anterior (9 patients) or posterior (9 patients) repair of the diaphragmatic hiatus. Outcomes were assessed for dysphagia, reflux and satisfactory outcome following surgery.

Results: Clinical outcomes 18 months after surgery were available for 100% of patients. There was no significant difference between the 2 techniques for symptoms of dysphagia all through the short term follow-up evaluation. Better control of heartburn was achieved in patients in the anterior hiatal repair group. Patients from both groups were equally satisfied with the overall outcome after surgery.

Conclusion: Within the 18 months follow-up evaluation, there was no significant difference in dysphagia between anterior and posterior hiatal repair. However, long term follow up studies should be done to confirm this outcome.

Introduction

Gastroesophageal Reflux Disease (GERD) is arguably the most common disease encountered by the gastroenterologist and its effects are experienced daily by up to 10% of the population [1]. Laparoscopic Nissen fundoplication is now considered the standard surgical approach for treatment of severe Gastroesophageal Reflux Disease (GERD).

Laparoscopic Nissen fundoplication with posterior hiatal repair is the commonest surgical technique used. Long-term outcome studies have established that it provides satisfactory clinical outcomes and good control of reflux symptoms in most patients [2].

However, postoperative dysphagia remains a cause of troublesome morbidity at late follow-up in a subset of patients. The literature proposes many possible explanations for post-fundoplication dysphagia, although the causal link between these potential mechanisms and outcomes is still unclear [3].

Surgeons have focused mainly on issues concerning the optimal length of the wrap, fixation of the wrap, mobilization of the gastric fundus/division of the short gastric vessels, and the use of a bougie intraoperatively [4].

Two aspects of surgical technique have been shown unequivocally to have an impact on postoperative dysphagia: the technique used to construct the fundoplication and the method of hiatal closure. Most studies have focused on construction of the fundoplication with less attention being paid to the technique of closure of the esophageal hiatus. Although, closure of the esophageal hiatus is also an important technique as it prevents postoperative hiatal herniation, if excessively narrowed, the repair can also cause dysphagia [5].

Traditionally, closure has been achieved using posteriorly placed sutures. It is also possible to reduce the hiatal size using an anterior hiatal repair technique, and it has been hypothesized that anterior repair may achieve a more "anatomic" end result due to less anterior displacement of the esophagus thus keeping its axis straight. This might result in less postoperative dysphagia [5].

To test this hypothesis, we have undertaken a prospective double-blind randomized trial of anterior vs posterior hiatal repair during laparoscopic fundoplication.

Patients and Methods

Study population

This study is a prospective study conducted in KasrElainy School of Medicine, Cairo University on 18 patients presenting by Gastroesophageal Reflux Disease (GERD) with or without hiatus

hernia. This study was performed over a period of 18 months from January 2013 to June 2014.

Inclusion criteria

In brief, patients with proven gastro-esophageal reflux disease (presenting by regurgitation and heartburn or esophagitis and esophageal ulceration at endoscopy) were considered for entry into the study. Patients with respiratory complications were also included in this study. The studied population had an age range from 20-70.

Exclusion criteria

Patients suffering from esophageal motility disorders and recurrence following anti reflux surgery were excluded.

Preoperative assessment

All patients were enquired about their lifestyle, habits of medical importance (smoking and alcohol intake) and the previous use of anti-reflux medications.

In addition to the routine labs (blood picture, liver and renal function tests), patients were subjected to contrast studies (barium swallow and meal) and esophagogastroduodenoscopy (with biopsy when needed).

A formal consent was signed by all patients. Fundoplication was described for all patients and the possible complications (including pain, wound complications, recurrence, dysphagia, bleeding and esophageal or gastric injury) were discussed.

Randomization

This is a prospective, single blinded, randomized, controlled clinical trial. Patients were randomised to undergo laparoscopic Nissen fundoplication either with anterior or posterior hiatal repair. Randomization occurred in the operating room after the commencement of anesthesia by opening a pre-sealed envelope. Patients were blinded perioperatively to which procedure had been performed. Both techniques were performed by the same surgical team to standardize the procedure. No patients were withdrawn from the study after randomization. The Research and Ethics Committee of Kasr Elainy School of Medicine, Cairo University approved the protocol.

Operative technique

- **Positioning:** The patient lies supine on the operating table in reverse trendlenberg position. After induction of anesthesia, an orogastric tube is inserted to decompress the stomach.
- **1st Port:** A skin incision, 14 cm inferior to the xiphoid process, in the midline or 1–2 cm to the left of the midline, is done by the scalpel and by the help of two forceps the linea alba and the peritoneum were breached by the use of fine scissor. A 10 mm port with its trochar is inserted then the trochar is removed (Hasson method).
- **Insufflation:** is the next step until optimum abdominal pressure reaches 14 mmHg.
- Camera–30 degree is then introduced through the 1st port and the whole abdomen is inspected for any possible iatrogenic injuries during the introduction of the port.
- 2nd Port is placed in the left mid clavicular line at the same level with 1st port, and it is used for insertion of a Babcock clamp or for devices used to divide the short gastric vessels.
- 3rd Port is placed inthe right mid-clavicular line at the same level of the other two ports, and it is used for the insertion of a retractor to lift the left lateral segment of the liver.
- 4th& 5th Ports are placed under the right and left costal margins. They are used for the dissecting and suturing instruments.
- Inspection of the esophageal hiatus **(Figure 1)**.
- Gastrohepatic ligament is divided, beginning above the caudate lobe of the liver, where the ligament is usually very thin, and continuing toward the diaphragm until the right crus is identified (Pars Flacida) **(Figure 2).**
- The right crus is then separated from the right side of the esophagus by blunt dissection and continued inferiorly toward the junction with the left crus **(Figure 3)**.
- Posterior vagus nerveis identified and preserved.

Figure 1 Wide esophageal hiatus.

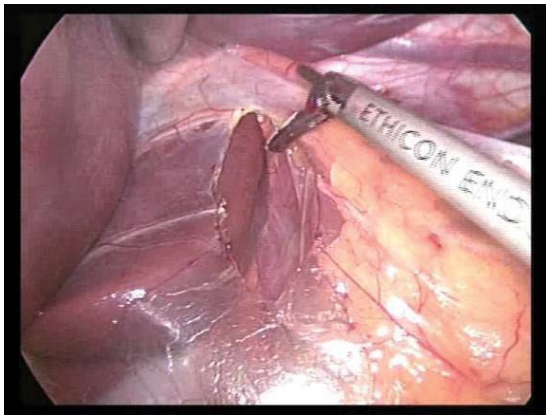

Figure 2 Division of gastrohepatic ligament.