

# Indications for the Laparoscopic Treatment of Gastroesophageal Reflux Disease

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## ABSTRACT

**Background:** The aim of the study was to evaluate the indications and surgical techniques for the treatment of gastroesophageal reflux disease.

**Methods:** From 1998 through 2000, we performed gastroesophageal reflux surgery on 12 patients. Preoperative studies revealed third-degree esophagitis in most patients with no functional alterations of the esophagus itself. The patients underwent a laparoscopic Nissen-Rossetti fundoplication. No conversions to open laparotomy were necessary. The mean operative time was 180 minutes.

**Results:** No intraoperative or immediate postoperative complications occurred. The mean postoperative stay was 6.2 days. Transitory postoperative dysphagia was noted in 8 patients. In 5 patients, it was mild and regressed after 2 weeks; in 3 cases, it was severe and regressed over 2 months.

**Conclusion:** A laparoscopic surgical approach is a satisfactory method for correcting gastroesophageal reflux disease. The efficacy of medical therapy has been well established. However, in the young person who may be required to take medication for many years or in those persons who are intolerant of standard medical therapy for gastroesophageal reflux disease, a surgical intervention is a satisfactory option. The success of medical therapy can be used as a predictive criterion of the success of laparoscopic Nissen-Rossetti fundoplication when normal motility of the esophageal corpus is present.

**Key Words:** GERD, Laparoscopy, Fundoplication.

## INTRODUCTION

Gastroesophageal reflux disease (GERD) represents various subclinical and clinical syndromes that with increasing gravity may require several therapeutic approaches for satisfactory management.<sup>1</sup> In the overall management of GERD, surgical treatment has assumed a new significance with the introduction of laparoscopic procedures. It offers all the possibilities of traditional surgical intervention that include partial fundoplication, anterior (Dor) or posterior (Toupet) and total (Nissen or Nissen-Rossetti) fundoplication with crural reapproximation. In addition, the postoperative course is usually more benign with laparoscopic versus open access in both the near- and long-term. The results of laparoscopic treatment can be considered positive in a global sense.<sup>2-6</sup> However, a reconsideration of surgical indications must be evaluated based on symptom resolution, the incidence of morbidity and mortality, together with local effects, such as dysphagia and the "gas bloat" syndrome. Surgical therapy must be viewed in light of generally efficacious medical therapy utilizing antisecretory drugs (ranitidine and proton pump inhibitors).<sup>7</sup> The aim of this study was to reexamine the indications for videolaparoscopic treatment with fundoplication to treat GERD.

## METHODS

From 1998 through 2000, 12 of 58 patients affected by GERD were treated with laparoscopic surgical interventions. Most patients were males (10 males and 2 females) with a mean age of 52 years (range, 45 to 67). The clinical evaluation involved endoscopy, pH-manometry, and upper gastrointestinal radiographic studies. The clinical scenario was dominated by heartburn and regurgitation. In all cases, symptoms resumed after the suspension of medical therapy that was correctly continued for a prolonged period (6 months). Fundamentally, medical therapy included dietary adjustments, weight loss, antisecretory drugs (ranitidine, proton pump inhibitors), and prokinetic drugs (**Table 1**).

In the preoperative assessment for possible surgical intervention, the presence of second- or third-degree esophagitis, manometric demonstration of low esophageal sphincter (LES) pressure or incontinence, and overall the

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Authors acknowledge all those who made significant contributions to the work: F. Samele and N. Tartaglia.

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**Table 1.**

Percent Incidence of the Principal Signs and Symptoms: Retrospective Evaluation of the Antecedents

Symptom	Incidence
Heartburn	84%
Regurgitation	76%
Dysphagia (mild)	17%
Nausea and vomiting	21%
Thoracic pain	24%
Respiratory symptoms	27%
Persistence symptoms in spite of medical therapy (antisecretory drugs, prokinetics, diet, and other treatments.)	100%

presence or absence of normal esophageal peristalsis were found to be important. Moreover, in all cases, demonstrable reflux (on 24-hour pH monitoring) and sliding hiatal hernias were found (Table 2).

The 12 patients selected based on clinical history and physical/laboratory findings underwent laparoscopic Nissen fundoplication. In 3 cases, hiatal hernioplasty was also included.

**RESULTS**

The immediate results of this series are characterized by the absence of conversions to laparotomy; nevertheless, 2 cases of iatrogenic diaphragmatic arterial vessel bleeding occurred that required intraoperative hemostasis maneuvers. Mean operative time was 180 minutes; the mean postoperative stay was 6.2 days (range, 4 to 11). In our initial experience, we were careful to resume alimentation. The postoperative stay was prolonged for more than

**Table 2.**

Preoperative Instrument Evaluation

Esophagogastroduodenoscopy: esophagitis (Savary-Miller classification)	
Second degree	5
Third degree	7
Normal esophageal peristalsis	12
Manometry-pH 24 hr	
Low esophageal sphincter incontinence	12
Mixed reflux (supine and orthostatism)	12
Contrast x-rays: Sliding hiatal hernia	12

10 days in 3 patients because of severe dysphagia in the postoperative phase that slowly resolved spontaneously within 2 months.

Worthy of attention is postoperative dysphagia that can be a significant problem as evidenced by its presence in 8 of our patients. It was mild in 5 patients and of short duration (41.6%) but was more serious in 3 patients and took longer to resolve (25%) (Table 3).

Results were evaluated 6 months postoperatively with instrument and clinical evaluation (esophagogastroduodenoscopy, pH manometry). Heartburn resolved entirely in 11 patients (91.6%); in only 1 patient did the trouble diminish but not permit the suspension of medical therapy. Esophagitis also greatly regressed in almost all patients (Table 4). The physiopathologic basis of GERD is functional. The central point is represented by hypotonia (incompetence) of the lower esophageal sphincter (LES) to which altered esophageal body motility or a delay of the gastric emptying, or both, can compound the prob-

**Table 3.**

Laparoscopic Nissen-Rossetti Fundoplication: Results of 12 Patients

Conversions	—
Operative Time (Mean)	180 minutes
Lesion of Diaphragmatic Arterial Vessel (intraoperative hemostasis)	2
Bronchopulmonary Nidus	1
Postoperative Stay (Mean)	6.2 days
Postoperative Dysphagia	
Moderate (4 weeks in duration)	5
Severe (2 months in duration)	3

**Table 4.**

Laparoscopic Nissen-Rossetti Fundoplication: Six Months Postoperative Follow-up

Heartburn	
Disappearance	11
Reduction (with suspension of medical therapy)	1
pH meter	
>4	9
<4	3
Esophagogastroduodenoscopy	
First degree esophagitis	11
Second degree esophagitis	1

lem. The sliding hiatal hernia is an anatomic alteration that often has little clinical relevance if it is not accompanied by reflux. The anatomicopathological lesions of esophageal mucosa (esophagitis, columnar metaplasia, and others) are effects of the prolonged action of acid reflux. All the surgical measures achieve anatomical correction of the esophagocardiac region, which must be followed by a functional result, either the abolition or at least the reduction of GERD.

The surgical construction of a fundoplication can be efficacious only for the control of acid gastroesophageal reflux, ie, abolition of heartburn and improvement or healing of lesions directly related to the presence of acid secretions (esophagitis, metaplasia). Fundoplication has no effect on altered esophageal motility or the delay of gastric emptying.

## DISCUSSION

The laparoscopic approach represents an attractive surgical solution for GERD. Overall at the exordium, after demonstration of the feasibility and advantages of minimally invasive surgery, the surgical indications for GERD have been suggested but not precisely defined. Should there be a wrap and if so, how much? Should a total 360-degree Nissen fundoplication be used or perhaps a 270° (Toupet), a partial wrap, anterior or posterior fixation, or other? The matter was not initially defined. However, somewhat of a guide does exist for choosing the most appropriate procedure. If preoperative manometry shows normal motility of the esophageal body, a short, floppy Nissen fundoplication (360°) is indicated. If, at the level of the esophageal body, untidy contractions of 25% of the total or a mean pressure <30 mm Hg are present, a partial Toupet fundoplication (270° or 180°) should be considered because a high risk of dysphagia may exist if a 360-degree wrap is performed.<sup>1,8,9</sup> Furthermore, alterations of esophageal motility, with a high degree of reflux are not corrected by fundoplication of whatever type and do not alter the postoperative results.<sup>10-12</sup> The feasibility and advantages of laparoscopic fundoplication in the treatment of GERD have been extensively demonstrated.<sup>1-4,13,14</sup> The failure of surgical treatment for GERD is indicated by the resumption of reflux symptoms along with dysphagia and gas bloat syndrome. A persistence of symptoms related to altered esophageal motility or to a delay in gastric emptying may exist.<sup>15</sup> A mild transitory dysphagia very often follows fundoplication, but it goes on to a spontaneous resolution within 4 to 6 weeks (17% to 34%).<sup>16</sup> Persistent dysphagia (4%)<sup>16</sup> and the gas bloat syndrome are almost

always due to a technical error in the construction of the fundoplication (usually too long and/or too tight or insufficient mobilization of the esophagus and fundus of the stomach.<sup>17</sup> The migration of the wrap, a paraesophageal hernia, or a tight hiatus hernioplasty can also be involved. So postoperative results are dependent on the correctness of the surgical indication.

A surgical approach considered less invasive must not be used unless the appropriate preoperative indications have been established. Generally, the persistence of reflux (and of its symptoms), or of often nonspecific symptoms related to abnormal esophageal motility are instead ascribed to an erroneous surgical indication.<sup>10,13</sup> In fact, some techniques, such as the anterior fundoplication, do not offer sufficient guarantees of success in the treatment of a clinically relevant GERD, but they remain efficacious in some particular situations, such as completion of myotomy or vagotomy. In case of trouble from altered esophageal motility associated with the reflux, we can recognize 2 points of reference: the use of a posterior partial fundoplication and the conviction that the surgical measure, whatever it is (total fundoplication or posterior partial), will only partially modify the clinical scenario.<sup>11,18-20</sup> So the condition remains a fundamental point that determines the success of the surgical indication of the GERD.

Clinical and instrumental data allow the clinician to recognize those patients who will benefit from laparoscopic fundoplication, ie, the presence of GERD with third-degree esophagitis, age <50 years, presence of typical symptoms, esophageal heartburn with demonstration of a failure of the LES, complete resolution of the symptoms with antiacid therapy (proton pump inhibitors).<sup>1,5,21,22</sup> Moreover, we must consider 2 particular groups of patients. The first with altered motility and esophageal sphincter mechanism requires control of symptoms, and the second merits surgical therapy (patients with complications of reflux esophagitis, such as intestinal metaplasia with eventual dysplasia and esophageal stenosis). The other group, as we indicated above, includes patients with manometric alteration of the esophageal body motility who must be considered separately because fundoplication can provide only partial symptom resolution.

Today, medical therapy has been shown to be efficacious in the control of GERD, so that the failures of medical therapy are difficult to define and are very few.<sup>7</sup> The fact that the response to medical therapy is satisfactory, for the most numerous group of patients with reflux esophagitis, indicates the success of a surgical procedure because we

can assume that all the symptoms are to be attributed only to acid reflux and not, for example, to esophageal body alterations.

Surgical intervention can be indicated in those intolerant to therapy with proton pump inhibitors, from an incomplete response to medical therapy, or from a desire of the patient to definitively resolve reflux symptoms, to escape from the necessity of chronic drug administration.<sup>1,7</sup>

## CONCLUSION

Laparoscopic fundoplication, total or partial posterior, represents in general the best treatment of GERD in select patients. The advantages of a minimally invasive approach (more rapid and comfortable postoperative course, with less morbidity) are evident and unanimously accepted; the local complications remain fixed, and they are the same in both laparoscopy and laparotomy.

The efficacy of antisecretory medical therapy (proton pump inhibitors) and the limiting criteria of the same, are evident, ie, young age, local side effects, very long administration of the drugs. The success of medical therapy can be used as a predictive criterion of the success of laparoscopic antireflux plasty. Among the preoperative instrumental investigations, manometry can identify those patients with LES hypotonia along with alterations in esophageal body motility. In this way, a determination can be made of the efficacy of partial antireflux plasties (Toupet) or a complete 360-degree wrap, the Nissen procedure.

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