Quality of life before and after laparoscopic Nissen fundoplication

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Received: 16 August 2000/Accepted in final form: 18 October 2000/Online publication: 13 March 2001

Abstract

Background: Gastroesophageal reflux disease (GERD) is a common disorder in the Western world. The acute disease can usually be managed by medical therapy. To prevent relapse, many patients require lifelong medication. In these patients, laparoscopic antireflux surgery offers a good alternative. The aim of this study was to evaluate the postoperative results and compare pre- and postoperative quality of life after laparoscopic Nissen fundoplication.

Methods: Clinical investigations, including esophageal manometry, pH monitoring, and endoscopy, and a previously validated Quality of Life Index, were performed before and a median of 41 month after antireflux surgery in 75 patients.

Results: After laparoscopic Nissen fundoplication, the percentage of total time with pH <4 decreased from 10.4% to 3.2% on 24-h pH monitoring. The mean pressure of the lower esophageal sphincter improved from 8.1 to 12.3 mmHg. Esophagitis healed in 63 of 66 patients in whom it was present prior to surgery. The overall Quality of Life Index improved significantly from 86 ± 16 to 116 ± 16.

Conclusion: Laparoscopic fundoplication provides effective and durable relief of reflux in patients with GERD. The Quality of Life Index showed significant improvement after surgery.

Key words: Gastroesophageal reflux disease — Laparoscopic fundoplication — Quality of life

Gastroesophageal reflux disease (GERD) is the most common benign foregut disorder. Epidemiological studies have shown that 10–20% of the population in the Western world complain of typical reflux symptoms, such as heartburn or regurgitation [5]. In the United States, 7% of adults experience heartburn every day, 14% have heartburn on a weekly basis and 40% have heartburn on a monthly basis [5]. The acute disease can usually be treated by medical therapy with proton pump inhibitors. However, up to 50% of the patients may require continuous medical therapy to prevent relapse [3].

In patients with recurrent GERD, laparoscopic antireflux surgery offers an attractive and cost-effective alternative to potentially lifelong medical therapy [20]. Consequently, every patient with persistent or recurrent symptoms and/or complications of gastroesophageal reflux who depends on maintenance medical therapy to remain in remission is a potential candidate for laparoscopic antireflux surgery, particularly if the patient is young, suffers from side effects of the medical therapy, or worries about the long-term safety of the conservative treatment [17].

Quality of life is an important factor when selecting a treatment option for patients with chronic disorders. Quality of life is severely impaired in patients with recurrent GERD [13]. Therefore, evaluations of the efficacy of continuous medical acid suppression therapy and antireflux surgery should take into account not only the healing of esophagitis and restoration of physiological abnormalities but also its effect on the patients’ quality of life [11].

So far, only a few studies have focused on the effect of various treatment modalities for GERD on the quality of life. Most of these studies included only a small number of patients or are based on “soft” data, such as patient’s reports of symptoms [1, 6, 8, 12, 19]. The Gastrointestinal Quality of Life Index, originally introduced by Eypanas et al., is an objective and valid instrument for the assessment of quality of life before and after treatment for upper gastrointestinal disorders [4]. In this study, we used this index, in addition to symptom scores, endoscopic findings, and physiological data, to assess the outcome of laparoscopic Nissen fundoplication in patients with chronic GERD.

Materials and methods

Patient population

Between January 1993 and January 1999, a total of 146 patients had a laparoscopic Nissen fundoplication for chronic GERD at our institution. All patients had a thorough preoperative examination that included a standardized assessment of their symptoms, upper gastrointestinal endoscopy, 24-h esophageal pH monitoring, and esophageal manometry. All patients...
were invited to participate in a prospective study with repeat symptom assessment, endoscopy, and functional studies (manometry and pH monitoring) at a minimum time interval of 6 months after surgery in addition to a structured evaluation of their pre- and postoperative quality of life. The following groups were excluded from the analysis: patients who did not wish to participate in this prospective study (n = 12), those with peptic strictures (n = 5), those who had undergone fundoplication for atypical symptoms (n = 10), those who did not undergo a complete postoperative assessment at our institution (n = 31), and those in whom the structured quality-of-life assessment was not possible because of language barriers (n = 13).

A total of 75 patients who had undergone a complete pre- and postoperative assessment at our institution remained for analysis. The mean age was 44 years (range, 23-67); 45 were men and 30 were women. All patients had a preoperative history of longstanding GERD that required maintenance treatment with proton pump inhibitors. Symptoms, endoscopy, physiological studies, and a structured quality-of-life assessment were evaluated prior to surgery and at a median of 41 month (range, 8-71) after surgery.

Surgical technique

Laparoscopic fundoplication was performed according to the modification of Nissen-Rossetti, as described in detail previously [14]. Briefly, after mobilization of the proximal portion of the greater curvature and approximation of the hiatus, a short (3-cm) and loose 360° fundoplication was performed around the distal esophagus, employing the anterior wall of the fundus. A large intrathoracic bougie was used to size the hiatal approximation and the fundoplication. At the end of the procedure, a nasogastric tube was placed for 12-24 h. Oral intake was started on the 1st postoperative day. Patients were discharged between 2 and 7 days (median, 4) after the procedure.

Pre- and postoperative assessment

Endoscopy was performed with a flexible endoscope and videorecorded. The presence of esophagitis was noted and graded according to the Savary-Miller classification. Biopsy samples were taken of all abnormalities and assessed histopathologically. Barrett’s esophagus was defined by the histologic proof of specialized intestinal metaplasia in the distal esophagus [16].

Manometry was carried out after an overnight fast using a standard water perfusion catheter system. The lower esophageal sphincter (LOS) length and pressure were measured using a standard station pull-through technique as described previously [15].

Ambulatory 24-h ambulatory esophageal pH monitoring was performed 6-2 weeks after cessation of all acid-suppressing drugs. A glass pH electrode was passed transnasally, placed 5 cm above the manometrically located lower esophageal sphincter, and connected to a portable data recorder. Patients were instructed to pursue their normal activities during recording. There were no dietary restrictions. An esophageal acid exposure of time (percentage time with pH <4) of >4.5% during the 24-h recording was considered abnormal [15].

The presence of heartburn, dysphagia, and regurgitation was assessed with a standardized questionnaire. The severity of each symptom was graded according to the following scale [15]: 0 = symptom not present; 1 = symptom present occasionally, not interfering with daily activities; 2 = symptom present frequently, interfering with daily activities; 3 = symptom present constantly, severely interfering with daily activities.

Quality of Life Index

Quality of life was assessed with the structured Quality of Life Index originally introduced by Eysenbach et al. [4]. This index is specifically designed to assess patients with gastrointestinal disorders. The tool consists of 56 questions and four subgroups, called “items.” These items—symptoms, physical well-being, psychological well-being, social relationships—were chosen to reflect the patients’ specific perceptions of their disease and its treatment, because quality of life is comprised of a number of different aspects. Extensive validation of this Quality of Life Index has been performed previously [4].

Statistical analysis

The incidence of symptoms was expressed as mean values and percentage of the corresponding group. The Quality of Life Index and the physiologic data were expressed as mean and standard deviation (SD). The Mann-Whitney U test was used for statistical analyses. All tests were performed using SAS software. Data are given as prevalences or mean ± SD. The significance level was set at p < 0.05.

Results

In all cases, the procedure was completed laparoscopically without major intraoperative or postoperative complications. There were some minor complications, including pleural effusion (four patients), pneumothorax (two patients), wound infection (one patient), and femoral vein thrombosis (one patient).

The preoperative and postoperative results of the functional investigations are shown in Fig. 1A and B. A comparison of the pre- and postoperative findings shows that the mean percentage of the total time with pH <4 on 24-h pH monitoring decreased from 10.4% to 3.2%. On postoperative assessment, 68 of 75 patients had a normal esophageal exposure to pH <4—i.e., a percentage of time with pH <4 <4.5%. The mean pressure of the lower esophageal sphincter improved from 8.1 to 12.3 mmHg after Nissen fundoplication.

Prior to surgery, eight patients had stage 1a esophagitis, 15 patients had stage 1b, 19 patients had stage 2a, and 24 patients had stage 2b. Intestinal metaplasia in the distal esophagus—i.e., Barrett’s esophagus—was present in seven patients prior to surgery. Two patients had no signs of esophagitis or Barrett’s esophagus. On postoperative assessment, esophagitis had healed in 63 of 66 patients who had esophagitis prior to surgery; three patients had endoscopic findings of stage 1a esophagitis. Barrett’s esophagus persisted after surgery in all seven patients who had intestinal metaplasia of the distal esophagus before surgery (Fig. 1C).

A pre- and postoperative comparison of symptom incidence and the Quality of Life Index is shown in Figs. 2 and 3. On preoperative assessment, 73 of 75 patients (97.3%) complained of heartburn (mean severity, 2.4), 52 of 75 (69.3%) suffered from regurgitation (mean severity, 1.9), and 23 of 75 (30.7%) had dysphagia (mean severity, 1.4). On postoperative evaluation, the prevalence and severity of all symptoms were significantly reduced. Of the 75 patients, five (6.6%) complained of heartburn, two (2.7%) reported regurgitation, and six (8%) had dysphagia (Fig. 2A and B).

All five patients with postoperative heartburn had increased esophageal acid exposure on postoperative pH monitoring (though it was significantly reduced from the preoperative values). Three also had grade la esophagitis; two of these patients also complained of recurrent regurgitation. In three of these five patients, the fundoplication had become disrupted; the remainder had an intact warp. All three patients with recurrent esophagitis after antireflux surgery are back on acid-suppressing drugs.

All six patients who reported postoperative dysphagia also suffered from dysphagia prior to surgery; however, the severity of dysphagia has not increased from the preoperative level. Esophageal manometry showed poor esophageal clearance function in three of these patients.