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Original Research Article

Quality of life in total fundoplication surgery versus partial fundoplication in patients with gastroesophageal reflux disease

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ABSTRACT

Background: Gastroesophageal reflux disease (GERD) is a chronic disease with a prevalence of 20%, which has increased in recent years with complications such as Barrett's esophagus and risk of esophageal adenocarcinoma. Therefore, its medical and surgical treatment is crucial for the prognosis.
Methods: A retrospective cohort study of quality of life using the GERD questionnaire (GERDQ) was performed in patients with GERD who received surgical treatment with one-year postoperative follow-up at a tertiary care hospital in 2023. Patients were divided into two groups based on treatment: total fundoplication (group A) and partial fundoplication (group B). Statistical analysis included percentages, means, standard deviations, and group comparisons using the Chi-square test.
Results: Of the 35 patients, the mean age was 53.71±11.26 years, more frequent in women (54.30%). Typical symptoms were presented in 85.70% of cases, with persistence of these in 68.60%, indicating surgery, with symptoms lasting 122±68.88 days. The most frequent comorbidities were obesity and diabetes (22.90%). 54.30% underwent total fundoplication (group A) and 45.70% underwent partial fundoplication (group B). A low probability of presenting GERD after surgery was 78.90% in group A versus 75% in group B.
Conclusions: The quality of life is good in patients with GERD after surgical treatment, both with total fundoplication and partial fundoplication, obtaining a low probability of presenting GERD in both surgeries with the GERDQ questionnaire, with similar percentages of 78.90% versus 75%.

Keywords: Reflux, GERD, Anti-reflux surgery, Esophagitis, Fundoplication

INTRODUCTION

Gastroesophageal reflux disease (GERD) is a chronic, benign disease identified as a public health problem and the leading pathology of the esophagus. It occurs when gastric contents reflux into the esophagus. More than 20% of the population reports GERD symptoms, with a prevalence of between 10 and 20%. In recent years, there has been an increase in the incidence of GERD complications.[1,2]

This pathology has nonspecific symptoms, but typical and atypical symptoms can be highlighted. Typical symptoms include heartburn, regurgitation, and dysphagia, and atypical symptoms include cough, hoarseness, chest pain, recurrent pneumonia, and bronchial spasms, among others.[3,4]

GERD is a progressive disease. Symptoms can be frequent and persistent, such that mechanical impairment of the lower esophageal sphincter (LES) and loss of the high-pressure zone can continue until they are complicated by exposure of duodenal contents of bile and pancreatic juice to the esophageal mucosa, causing esophagitis, stricture, progressive pulmonary fibrosis, and Barrett's esophagus, with risk of cancer.[1-3]

Diagnosis is clinical; tools are available, such as a therapeutic trial with high doses of proton pump inhibitors, especially in atypical symptoms. If the test fails or there is diagnostic uncertainty, objective testing is recommended, such as endoscopy with erosive esophagitis, or 24-hour pH monitoring, which quantifies acid in real time and associates exposure with symptoms, number of episodes, and frequency.[4,5]

The basis of medical treatment is acid suppression with a 12-week regimen, along with hygiene and dietary measures. High doses are recommended for persistent esophagitis, with improvement in 80% to 90% of cases, and in severe esophagitis, in 50% of cases, with symptom recurrence within 6 months of 80%. Most patients will require medication throughout their lives.[1,2,6]

Antireflux surgeries will be offered in 25% to 50% of cases for persistent or progressive disease. The most commonly used procedure is laparoscopic fundoplications, with results greater than 90%.[1,3,4,6]

Indications include an objective diagnosis of GERD, persistent symptoms despite medical treatment, and a young patient who desires surgery. Objective diagnosis is with endoscopy or pH monitoring, except in patients with structural defects of the LES, who do not respond well to medical treatment, with a clinical diagnosis. Preoperative evaluation requires manometry to assess the body's propulsive force and its ability to propel the food bolus. A decision is made to select for total surgery in cases of normal peristalsis and partial surgery in cases of absence or failure, ruling out achalasia.[7,8]

The objectives of surgery are to create a new valve that prevents reflux, with an increase in pressure and a length of at least 3 cm, an intra-abdominal length of 2 cm, and allowing the cardia to relax for 10 seconds during swallowing.[1,2]

The total or Nissen fundoplication, created in 1937, consists of a 360° encirclement of the gastric fundus, surrounding the distal portion of the esophagus for a length of 4 to 5 cm.[3,6,7]

Some modifications are the Nissen-Rossetti and Nissen-floppy types. In the former, the pillars are closed, the fundus is left tension-free on the right side of the esophagus, and the fundus is sutured from fundus to fundus, fixed to the anterior wall. In the latter, the short gastric vessels are divided for better esophageal mobilization.[1,2,9]

Partial fundoplication follows the same principles, reducing the side effects of the total fundoplication. These modifications are used when esophageal motility is impaired and propulsive force is insufficient to overcome the obstruction. There is a posterior partial fundoplication, or Toupet, of 270°, in which the posterior wall of the gastric fundus is used to wrap around the esophagus.[1,7,8]

Anterior partial fundoplication, or Dor, of 180°, in which the anterior wall of the gastric fundus is used to wrap around the anterior wall of the esophagus. There are other variants of 90°, 120°, or 240°.[1,2,8]

The expected side effects of this surgery are temporary dysphagia lasting 3 to 12 months, with 5% experiencing dysphagia lasting beyond a year; the inability to belch and vomit; and increased flatulence, which averages 3 to 6 months, and resolves within 12 months in 90% of cases.[1,7,9,10]

There are different methods for assessing the quality of life of postoperative GERD patients. Among the most widely used is the gastroesophageal reflux disease questionnaire (GERDQ). This questionnaire, developed in 2007, consists of six questions about symptoms over the past 7 days, with a sensitivity of 65% and a specificity of 81%. It contains four positive predictors: heartburn, regurgitation, sleep disturbance, and medication use, and two negative predictors: epigastric pain and nausea.

A score of 0 to 3 is used for positive predictors and 3 to 0 for negative predictors. The total score ranges from 0 to 18 points. A score of 0 to 2 indicates a low probability of having GERD, a score of 3 to 7 indicates 50%, a score of 8 to 10 indicates 79%, and a score of 11 to 18 indicates 89%.[9-12]

Total fundoplication has a complication rate of less than 4%, such as self-limited bleeding, and a conversion risk of less than 5%. The satisfaction rate is greater than 8.7 out of 10, more than 85% would accept the surgery again, and more than 90% would recommend it to a family member. The success rate for Nissen fundoplication is 90% to 95%, the risk of dysphagia varies from 2% to 69%, and symptoms related to air retention vary from 3% to 50%. These symptoms typically resolve within 12 months and persist in 5% to 10%.[3,4]

Partial fundoplications have poorer reflux control compared to total fundoplications (78% versus 90%), but fewer side effects of dysphagia and symptoms related to air retention.[7]

Regardless of the laparoscopic fundoplication performed, 86% show improvement in atypical symptoms, with 80% improving from pre-surgical to postoperative values in gastrointestinal quality of life surveys.[6,8]

All fundoplications have a success rate of over 90% at 2 to 3 years, with normalization of pH levels and resolution of atypical symptoms in over 60%.[13-15]

In general, gas-related side effects are less common in partial fundoplications; however, they tend to improve progressively in total fundoplications at 1 year. Reflux control is generally the same, and the occurrence of dysphagia varies across studies.[14,15]

The objective of this study was to analyze the quality of life in patients with GERD following surgical treatment with total fundoplication versus partial fundoplication.

METHODS

A retrospective single-center cohort study was performed at a tertiary care hospital, High Specialty Medical Unit (UMAE) No. 25 of the Mexican Social Security Institute (IMSS), Monterrey, Nuevo León, from January to December 2023. We studied cases of patients with GERD who underwent surgical treatment with either a total or partial fundoplication to assess their quality of life using the GERDQ questionnaire. Inclusion criteria were age 18 or older, gender of any gender, a clinical diagnosis of GERD or an objective study, total or partial fundoplication, one-year postoperative follow-up, and a record of the results of their GERDQ quality of life survey. Patients with prior antireflux surgery or cases of patients with achalasia or hiatal hernia were excluded. Patients with incomplete medical records were eliminated.

Groups

Patients were divided into two groups based on treatment: total fundoplication (group A) and partial fundoplication (group B).

Surgical technique

All surgical procedures were performed by a surgeon with advanced laparoscopy. In the total fundoplication, a vagus nerve-sparing hiatal dissection was performed, the esophagus was circumferentially released, the diaphragmatic crura were approximated with interrupted sutures, and the fundoplication was created without tension. The gastric fundus was used to wrap the esophagus, bringing the posterior wall toward the esophagus on the right side and the anterior wall toward the left side, achieving 360° coverage. In the partial fundoplication, the same principles were followed. In the posterior partial fundoplication, coverage was 270°, where the posterior wall of the gastric fundus was used to wrap the esophagus, and in the anterior partial fundoplication, coverage was 180°, where the anterior wall of the gastric fundus was used.

Follow-up

Patients were evaluated postoperatively, during the outpatient clinic, after a 1-year follow-up, using the GERDQ. The questionnaire consisted of 6 questions based on the presence of symptoms during the previous 7 days. We asked about 4 positive predictors: heartburn, regurgitation, sleep disturbance, and medication use; and 2 negative predictors: epigastric pain and nausea. A score of 0 to 3 was used for positive predictors and 3 to 0 for negative predictors. The total score ranged from 0 to 18 points. The results were recorded as percentages for each category: low probability of presenting GERD (0 to 2 points), moderate probability 50% (3 to 7 points), high probability 79% (8 to 10 points), and very high probability 89% (11 to 18 points).

Outcomes

The primary objective was to analyze the quality of life in patients with GERD following surgical treatment with total fundoplication versus partial fundoplication, using the GERDQ questionnaire. Other variables were also assessed, including symptoms, symptom duration, surgical indication, age, sex, and past medical history.

Analysis

Descriptive analysis and qualitative variables were presented as percentages (%) and frequency ranges. Quantitative variables were expressed as percentages (%), measures of central tendency (mean), and standard deviation (±SD). Comparisons between the two surgical groups were made using the percentage of each category of the GERDQ questionnaire, using the validated Perfect Statistical Professional Presented (PSPP) version 25 program. The research followed all the guidelines of the institution's research committee and local ethics committee, and approval was obtained for the study.

RESULTS

Of the 35 cases analyzed, the mean age was 53.71 years, with a standard deviation of 11.26, with a minimum age of 34 years and a maximum age of 86 years. The gender distribution was 54.30% (19) women and 45.70% (16) men (Table 1).

Table 1: Sociodemographic characteristics of the sample.

Variables	Frequency (N)	Percentage (%)
Gender		
Men	16	45.70
Women	19	54.30
Age (years)	53.71±11.26	

Data represented as mean±SD, SD: standard deviation

According to the symptoms presented by GERD patients, 85.70% (30) suffered from typical symptoms and 14.30% (5) suffered from atypical symptoms.

Regarding surgical indication, the most frequent indication was persistence of symptoms despite medical treatment, at 68.60% (24), followed by patient desire (22.80%) (8), and severe esophagitis (8.60%).

The mean duration of symptoms before surgical treatment was 122 days, with a standard deviation of 68.88 days, a minimum value of 90 days, and a maximum value of 365 days.

Regarding personal medical history, 25.70% (9) were obese, 25.70% (9) had diabetes mellitus, 17.10% (6) had high blood pressure, 22.90% (8) had both diabetes and hypertension, and 8.60% (3) smoked.

Finally, the patients were divided according to the type of fundoplication performed. It was found that 54.30% (19) had undergone a total fundoplication, designated for the purposes of the study as group A, and 45.70% (16) in group B, corresponding to the patients who underwent partial fundoplication.

In group A, the mean age was 53 years, the most frequent gender distribution was women (52.60%) (10), 89.50% (17) presented typical symptoms and 10.50% (2) atypical symptoms, the mean duration of symptoms before surgical treatment was 116.80 days, the most frequent surgical indication was persistent symptoms (68.40%) (13), and the most frequent medical history was obesity (26.30%) (5) and diabetes (26.30%).

In group B, the mean age was 54 years, the most frequent gender distribution was women (56.30%) (9), 81.30% (13) presented typical symptoms and 18.80% (3) atypical symptoms, the mean duration of symptoms before surgical treatment was 128.12 days, the most frequent surgical indication was persistent symptoms (68.80%) (11), and the most frequent medical history was obesity (25%) (4), diabetes (25%) (4), and the presence of diabetes and hypertension (25%) (4) (Table 2).

The GERDQ was administered to postoperative patients with fundoplication with one-year postoperative follow-up. It consisted of 6 questions based on the presence of symptoms during the previous 7 days. It contained 4 positive predictors: heartburn, regurgitation, sleep disturbance, and medication use, and 2 negative predictors: epigastric pain and nausea. The probability of developing GERD was classified as low at 0 to 2 points, moderate at 3 to 7 points, high at 8 to 10 points, and very high at 11 to 18 points.

In both groups A and B, the highest percentage was found for low probability of developing GERD after surgery: 78.90% (15) and 75% (12), respectively. There was no statistical significance, as expected due to the sample size.

However, the significant percentage allows us to conclude that patients with GERD after surgical treatment with total fundoplication and partial fundoplication have a good quality of life. In group A, 78.90% (15) had low probability, 15.80% (3) had moderate probability, 5.30% (1) had high probability, and none had very high probability.

In group B, 75% (12) had low probability, 12.50% (2) had moderate probability, 6.30% (1) had high probability, and 6.30% (1) had very high probability (Table 3).

Table 2: Characteristics of patients with GERD after total fundoplication versus partial fundoplication.

Variables	Total fundoplication (group A) % (N) (n=19)	Partial fundoplication (group B) % (N) (n=16)
Age (years)	53±11.11	54±11.12
Gender		
Men	47.40 (9)	43.80 (7)
Women	52.60 (10)	56.30 (9)
Symptoms		
Typical	89.50 (17)	81.30 (13)
Atypical	10.50 (2)	18.80 (3)
Duration of symptoms (days)	116.80±42.30	128.12±32.31
Surgical indication		
Persistent symptoms	68.40 (13)	68.80 (11)
Patient's desire	21.10 (4)	25 (4)
Severe esophagitis	10.50 (2)	6.30 (1)
Medical history		
Obesity	26.30 (5)	25 (4)
Diabetes	26.30 (5)	25 (4)
Hypertension	15.80 (3)	18.80 (3)
Diabetes and hypertension	21.10 (4)	25 (4)
Smoking	10.50 (2)	6.30 (1)

SD: standard deviation, n: number of cases, %: percentage, *: Chi-square test

Table 3: GERDQ questionnaire in patients with GERD postoperative with total fundoplication versus partial fundoplication.

GERDQ	Total fundoplication (group A) % (N) (n=19)	Partial fundoplication (group B) % (N) (n=16)
Low probability	78.90 (15)	75 (12)
Moderate probability	15.80 (3)	12.50 (2)
High probability	5.30 (1)	6.30 (1)
Very high probability	0	6.30 (1)

DISCUSSION

This study focuses on analyzing the quality of life in patients with GERD following surgical treatment with total fundoplication versus partial fundoplication.

In our study, patients in both groups A and B, aged between 50 years and 25%, had comorbidities such as obesity, diabetes, and hypertension, and more than 50% were women. This finding has not been shown to be significant in other studies, so there are no references for comparison (Table 2).

Patients with GERD who underwent fundoplication were found to have typical symptoms (80.75%) and a smaller proportion (14.30%) had atypical symptoms.[5] At the same time, it was found that 68.60% of patients presented persistent symptoms, indicating a surgical approach. This percentage is higher than the literature review, which indicates that 25 to 50% of people with GERD will have persistent disease, indicating surgical resolution.[1,2,4]

Medical treatment before surgery lasted more than 5 weeks, with the international recommendation being 12 weeks, since the mean duration of symptoms in group A was 116.80 days and in group B 128.12 days, between 16 and 18 weeks.[1,2]

Regarding the side effects that arise in patients with GERD who underwent fundoplication, in both study groups, group A and group B, a smaller group of patients had a high probability (5.3% to 6.3%) of experiencing temporary dysphagia or nausea for 9 to 12 months after surgery, within the percentages reported in the literature review, which indicated percentages between 5 and 10% with subsequent resolution.[9,10] With the application of the GERDQ questionnaire to patients with gastroesophageal reflux disease, it was analyzed that the quality of life in both focused groups is very encouraging, obtaining a low probability of presenting GERD after surgery of 75% in a partial fundoplication and 78.90% in a total fundoplication, our results are similar to the case reviews that we reviewed, where it is concluded that partial fundoplications have less reflux control compared to total fundoplications of 78% versus 90%, however, the percentages are within the ranges for laparoscopic fundoplications (Table 3).[7,11,12] The study also shows that with a percentage of atypical symptoms ranging from 10% to 20% among patients, their improvement rises to 80%. This is within the range of values reported by several authors, with symptom improvement rates greater than 80%.[6,8]

This study analyzes that the level of satisfaction with undergoing a total or partial fundoplication does not very much, with the difference being 3.6% for those who desire a partial one. This is compared to the international level of satisfaction, which indicates that more than 80% would accept the surgery again.[3,4,7]

Limitations

The limitations of this study are that it was a retrospective study, with a considerable sample of patients, which could be carried out in the future as a prospective cohort, with a larger sample to reduce bias, in different hospital units, comparing the results with this study.

CONCLUSION

The quality of life assessed by the GERDQ questionnaire in patients with GERD following surgical treatment with total fundoplication versus partial fundoplication was similar for both groups, falling into the low probability category of developing GERD after surgery.

Total fundoplication has a 78.90% low probability of developing GERD after surgery, versus 75% for partial fundoplication. However, both are within the low probability category. Therefore, there was no statistical significance, as expected due to the sample size. It is concluded that there is a good quality of life in patients with GERD following surgical treatment with both total fundoplication and partial fundoplication.

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