Is laparoscopic antireflux surgery for gastroesophageal reflux disease in the elderly safe and effective?

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Abstract

Background: The elderly have prevalence rates and clinical features of gastroesophageal reflux disease (GERD) similar to those in younger individuals, but the role of laparoscopic antireflux surgery (LARS) in the elderly has not been clearly established. The purpose of this study was to determine if the results of LARS in the elderly are comparable with those in younger patients.

Methods: All patients undergoing LARS for GERD at the Washington University Medical Center were entered prospectively into a computerized database. Between May 1992 and June 1998, 339 patients underwent LARS and were divided into two groups based on age: nonelderly (ages, 18–64 years; $n = 303$) and elderly (age, ≥ 65 years; n = 36). Data were expressed as mean ± standard deviation (SD) and statistical analysis was performed.

Results: Elderly patients had a higher American Society of Anesthesiology (ASA) score (2.3 ± 1.5) and a longer hospital stay (2.1 ± 0.2 days) than the younger group (ASA, 1.9 ± 0.5; hospital stay, 1.6 ± 0.9 days; $p < 0.001$). Operation times averaged 154 ± 68 min in the elderly compared with 134 ± 49 min in the nonelderly ($p = $ NS). Grade I complications occurred significantly more frequently in the elderly (13.9%) than in the nonelderly (2.6%), but the incidence of grade II complications was similar between the groups (elderly 2.8% vs nonelderly 2.7%). There were no grade III complications in either group, but there was one death in the nonelderly group. At follow-up ranging to 81 months (median, 27 months), the two groups had similar low incidences of heartburn and dysphagia. Anatomic failures of LARS developed in 19 nonelderly patients (6.2%) compared with 2 elderly patients (5.5%; $p = $ NS).

Conclusions: As shown in this study, LARS is safe and effective in elderly patients with GERD. Age older than 65 years should not be a contraindication to laparoscopic antireflux surgery in properly selected patients.

Key words: Elderly — Gastroesophageal reflux — Laparoscopic surgery — Nissen fundoplication

In the 1990s, laparoscopic antireflux surgery (LARS) became increasingly accepted as the preferred surgical therapy for patients with severe or complicated gastroesophageal reflux disease (GERD). Several studies have shown excellent results with LARS, with success rates of 93% to 97% and a low incidence of complications [10, 11, 25]. Compared with open Nissen fundoplication, the laparoscopic procedure has been associated with decreased postoperative pain, shortened hospitalization, and a faster recovery [5, 6, 14].

Most patients with GERD who come to surgery are between the fourth and sixth decades of life. They are referred for operation because of reflux complications, failure of medical therapy to control symptoms, or avoidance of the need for intensive lifelong medical therapy. Despite the focus of LARS in young and middle-age individuals, the elderly are also susceptible to symptomatic GERD and have been shown to have prevalence rates, disease patterns, and clinical features similar to those in younger patients [27].

The aging of the population in Western countries has created increasing demands on our health care systems for high-quality, effective, and cost-efficient care. Elderly patients are often challenging to treat surgically because of decreased functional reserve and more complex comorbidities. Consequently, the advantages of minimally invasive surgical approaches to treatment may be especially important in elderly individuals. Whereas several studies have analyzed the results of laparoscopic cholecystectomy in the elderly [7, 9, 12, 16, 26], only one previous study has specifically considered the role of LARS in this group [28]. The purpose of this study, therefore, was to review our experi-

Table 1. Demographic and preoperative characteristics of patients undergoing laparoscopic antireflux surgery

	Nonelderly	Elderly	p value
Number of patients	303	36	
Age	44.2 ± 10.2	68.7 ± 3.8	0.001
Sex distribution:			
Females	134 (44%)	21 (58%)	0.108
Males	169 (56%)	15 (42%)	
Weight (kg)	88 ± 16	79 ± 18	0.007
ASA class	1.9 ± 0.5	2.3 ± 0.5	0.001
LES pressure[a]	8.4 ± 6.3	8.3 ± 6.0	NS
Previous abdominal			
surgery	146 (48%)	24 (67%)	0.04

[a] Resting lower esophageal sphincter pressure in mmHg[++]

ASA, American Society of Anesthesiology; LES, lower esophageal sphincter; NS, not significant

ence with LARS in patients older than 65 years, and to compare outcomes with those in younger individuals.

Methods

The study group consisted of all patients treated with laparoscopic antireflux surgery for symptomatic GERD by the authors from May 1992 through November 1998. Patients who had paraesophageal hernias were excluded from the analysis. Data were analyzed from a prospectively collected database, and patients were divided into two groups based on age. Group 1 consisted of 303 nonelderly patients younger than 65 years (range, 18–64 years), and group 2 was composed of 36 elderly patients 65 years of age or older (range, 65–82 years).

All patients manifested symptoms of GERD and had undergone standard preoperative evaluation, which consisted of upper gastrointestinal endoscopy (97%), barium esophagograms (46%),and esophageal manometry (96%). In all patients with atypical symptoms of GERD, and in those who did not have esophagitis on upper gastrointestinal (GI) endoscopy, 24-hour pH analysis was performed. More patients in the elderly group (75%) had preoperative esophageal pH studies than in the nonelderly group (66%).

Selection for LARS was based on standard clinical criteria [29]. Patients were not excluded as operative candidates on the basis of their age alone. The technique used for laparoscopic Nissen fundoplication varied in the first 53 patients as previously reported [29]. The remaining procedures were carried out using a standardized technique that involved posterior closure of the crura, division of the short gastric vessels, floppy short wrap over a large esophageal dilator, and suture of the wrap to the crura. Patients with significant dysmotility of the esophageal body were subjected to a partial 270° wrap or Toupet fundoplication.

Postoperatively, parenteral narcotics and antiemetics were administered as needed. Patients were started on clear liquids the morning after surgery, advanced to a soft esophageal diet as tolerated, and discharged once they could tolerate a diet and were medically stable. Routine follow-up evaluations were performed at 1, 3, and 12 months postoperatively, then annually. Patients unable to return for an office visit were contacted by telephone for assessment of symptoms and response to treatment. Complications were classified according to the grading system proposed by Clavien et al. [2]. All data were expressed as mean ± standard deviation (SD). Statistical analysis was performed using Student's t-test and chi-square analysis, with significance assigned at $p < 0.05$.

Results

The demographic and preoperative features of the two groups of patients are shown in Table 1. Differences between the two groups included a higher mean weight in the nonelderly. Elderly patients had a significantly higher average American Society of Anesthesiology (ASA) score

Table 2. Operative and perioperative results in elderly and nonelderly patients undergoing laparoscopic antireflux surgery

	Nonelderly	Elderly
Type of fundoplication		
Nissen	272	35
Toupet	31	1
Conversions	2 (0.7%)	0
Operative time (min)	134 ± 49 (60–350)	154 ± 68 (80–345)
Resumption of liquids		
(days)	1.0 ± 0.2	1.0 ± 0.03
Resumption of soft diet		
(days)	1.2 ± 0.4	1.4 ± 0.1
Length of hospital stay		
(days)	1.6 ± 0.9	2.1 ± 0.2
Return to 100% activity		
(days)	13.1 ± 6.3	13.1 ± 1.2
Complications:[a]		
Grade 1	8 (2.6%)	5 (13.9%)
Grade 2A	3 (1.0%)	1 (2.8%)
Grade 2B	2 (0.7%)	0
Grade 3	0	0
Grade 4 (mortality)	1 (0.3%)	0

[a] Grading system according to Clavien et al. [2]

than the nonelderly: 31% of the elderly patients were ASA class 3 compared with only 12% of the nonelderly. Elderly patients also were more likely to have had previous abdominal surgery. Most of these prior operations were lower abdominal procedures that had minimal impact on the performance of the laparoscopic procedure. However, concomitant procedures were necessary in 45 of the nonelderly patients (15%) and in 12 of the elderly (33%). The most commonly performed secondary procedure was adhesiolysis, involving 29 nonelderly patients (9.6%) and 9 elderly patients (25%). Concomitant laparoscopic cholecystectomy was performed in five nonelderly patients (1.7%) and in one elderly patient (2.8%).

The operative and perioperative results for the two groups are given in Table 2. On the basis of the abnormal preoperative esophageal motility results, partial Toupet fundoplications were performed in 31 nonelderly patients (10.2%) and only one elderly individual (2.8%). Two patients were converted to open operation, both in the nonelderly group. Operative times averaged 20 min longer in the elderly, but this difference was not significant. Patients in both groups resumed liquid and soft postoperative diets at similar intervals postoperatively. However, length of hospital stay was significantly longer in the elderly ($p = 0.015$), although only by one-half day on the average. Seven elderly patients (19%) required hospitalization for more than 2 days postoperatively. Patients in the elderly group reported a return to 100% activity at a mean of 13 days postoperatively, which was identical to that observed for the nonelderly group.

Grade I complications occurred significantly more frequently in the elderly ($p = 0.001$), but the incidence of more serious grade II complications was similar in the two groups. The only complication that was grade II or higher in group 2 was a cardiac arrythmia in one patient. There were no grade III complications in either group. Perioperative mortality occurred in a single patient (0.3% overall)—one patient in group 1 who died on postoperative day 3 from an acute myocardial infarction.

Table 3. Follow-up results in patients with symptoms that required diagnostic evaluation after laparoscopic antireflux surgery

	Nonelderly	Elderly
Number of patients	303	36
Total patients requiring evaluation	65 (21.4%)	12 (27.8%)
Anatomic failures	19 (6.2%)	2 (5.5%)
Patients with intact wraps and non–GERD-related diagnoses	35 (11.6%)	7 (19.4%)
Patients with intact wraps and GERD-type symptoms[a]	11 (3.6%)	2 (5.5%)
Postoperative dysphagia	7 (2.3%)	1 (2.7%)

[a] Includes typical heartburn, regurgitation, or epigastric/substernal pain without other identifiable source of symptoms
GERD, gastroesophageal reflux disease

The functional results from LARS are shown in Table 3. At a median follow-up of 27 months (range, 1–81 months), the two groups had similar low incidences of heartburn and dysphagia sufficient to require diagnostic evaluation. Postoperatively, 65 patients (21.4%) in group 1 and 12 patients (27.8%) in group 2 underwent diagnostic evaluation for upper gastrointestinal symptoms. Anatomic failures of LARS as demonstrated by radiographic evaluation and upper GI endoscopy were detected in 19 nonelderly patients (6.2%) compared with 2 in the elderly group (5.5%). No significant difference in failure rate was observed between patients who had a Toupet versus a Nissen fundoplication [23].

Of the two elderly failures, one was discovered 18 months postoperatively during a Barium swallow performed to evaluate a chronic cough, at which time it was found that the wrap had migrated into the chest. The second patient was found to have a partially disrupted wrap with a small hiatal hernia during evaluation for recurrent heartburn and chest pain 5 months postoperatively. Symptoms have been mild in both patients, and neither has undergone reoperation or required medical therapy. Intact wraps were found in seven elderly patients whose symptoms were attributed to other causes including gastritis ($n = 1$), esophageal spasm ($n = 1$), esophageal irritability ($n = 2$), preexisting esophageal stricture ($n = 1$), distal esophageal food impaction ($n = 1$), and gas-bloat syndrome ($n = 1$). Two patients with typical recurrent GERD-like symptoms had intact wraps and have resumed medical therapy.

Discussion

Gastroesophageal reflux disease is a common disorder. It is estimated that as many as 7% of adult Americans experience symptoms of reflux at least twice per week [19]. Although GERD affects all age groups including the elderly, it has not been studied extensively in older individuals. However, as our population ages, recognition, evaluation, and treatment of GERD in the elderly will become increasingly important.

Several etiologic factors that may be associated with aging have been implicated in the development of GERD in the elderly [4, 27] including increased gastric acid secretion, disordered esophageal peristalsis, decreased esophageal protective mechanisms (reduced salivary bicarbonate secretion), delayed gastric emptying, increased incidence of hiatal hernia, and use of medications that can injure the esophageal mucosa or diminish lower esophageal sphincter pressure. Elderly patients who have GERD are more likely to present with atypical symptoms, including chest pain, abdominal symptoms, anemia, or aspiration, than their younger counterparts [17, 18, 20], which can lead to a delay in diagnosis. Another reason for underrecognition of GERD in the elderly is that symptoms may mimic or exacerbate other underlying medical conditions such as coronary artery disease or chronic lung disorders.

Several studies have suggested that elderly patients with GERD are likely to have more severe esophageal mucosal disease than do younger groups. Collen et al. [4] found that elderly patients with symptomatic GERD who required upper endoscopy for evaluation had a higher incidence of severe grade 3 or 4 esophagitis and Barrett's esophagitis than did the nonelderly. Zhu et al. [30] also found a higher incidence of pathologic reflux and esophagitis in the elderly. Furthermore, during 24-hour pH monitoring, a pH of less than 4 was noted in elderly subjects 32.5% of the time as compared with only 12.9% of the time in nonelderly individuals. Similar findings were reported by Allen [1], although reflux symptoms were more severe in the nonelderly. A more recent study in male Veterans demonstrated that the elderly had prevalence rates, patterns, and features of GERD similar to those in the nonelderly [27]. The lone exception was the subset of elderly patients with Barrett's esophagitis who exhibited milder symptoms than did younger individuals who had Barrett's.

With the availability of modern antisecretory therapy, most patients with symptomatic GERD can be managed medically regardless of their age. Surgical intervention has been reserved for patients with complications or those whose symptoms are refractory to medications, or it has been used as an alternative to lifelong medical therapy.

Despite these established indications for surgery, the role of antireflux surgery in the treatment of GERD in the elderly has not been well defined. The perceived morbidity associated with open antireflux operations has undoubtedly limited the acceptance of surgery in the past despite one controlled trial that demonstrated a superior outcome with open Nissen fundoplication as compared with medical therapy using ranitidine [24]. Concerns about increased morbidity and mortality in patients undergoing upper abdominal surgery probably have further limited the referral of elderly patients for surgical intervention.

The cost effectiveness of surgery versus medical therapy also must be considered in determining management options for these patients. In one analysis [3], it was found that open antireflux surgery not only produced superior clinical results, but also was more cost effective than omeprazole for men younger than 48 years and women up to 55 years of age. Because a laparoscopic approach to antireflux surgery has been proved less costly than its open counterpart [21, 27], the age at which surgery becomes more cost effective could be extended to the elderly, given the more active lifestyles of the elderly and increasing life expectancy.

A retrospective study of 103 patients undergoing open Nissen fundoplication by Allen et al. [1] found that patients 60 years of age or older had a much longer duration of symptoms (average, 14.4 years) before surgical intervention

than patients younger than 60 years (average, 4.1 years). Also, 65% of patients in the older group underwent surgery as a result of complications from GERD, whereas in the nonelderly group, 93% of patients were treated surgically because of intractability. Despite these differences in clinical presentation, morbidity in the elderly group was low, and there was no mortality. At a mean follow-up interval of 5.1 years, 86% of elderly patients had improvement in symptoms compared with 93% of the nonelderly.

The results of the current study demonstrate that good functional results also can be obtained in elderly patients undergoing antireflux surgery using a laparoscopic approach. Unlike findings from the study of Allen et al. [1], the duration of symptoms before operation in our elderly patients was similar to that in the nonelderly group. Perhaps the comparability of the disease states in the two age groups in our study reflects a tendency to earlier referral of elderly patients for definitive surgery in the laparoscopic era.

Trus et al. [28] reported results comparable with ours in a similar retrospective comparison of elderly and nonelderly patients undergoing LARS. In their study, no age group differences were noted in preoperative symptom scores or pH test results. Outcomes were similar between the two groups in terms of operative time, length of hospitalization, postoperative improvement in symptom scores, and pH test results [28].

In the current study, elderly patients were distinguished from the nonelderly by a higher ASA score and a greater likelihood of having undergone previous abdominal surgery. The other preoperative variables were comparable, and operative times were not significantly different between the two groups. Postoperative hospital length of stay was longer in the elderly by one-half day on the average, although the vast majority of elderly patients were discharged by the second postoperative day. Anatomic failures of the fundoplication occurred in two elderly patients, an incidence of failure equivalent to that in the nonelderly. The reasons for the failures in these two patients are unclear, but may have been related to technical and other factors as described previously [23]. Functional outcomes also were similar between the two groups.

Elective open abdominal surgery has proved to be safe and effective when performed in carefully selected elderly patients [13]. Although the benefits of laparoscopic surgery have been demonstrated for many procedures, the advantages may be especially important in the elderly who often have more comorbid medical conditions, more severe primary disease processes, and less functional reserve than younger individuals. Laparoscopic cholecystectomy already has been proved highly successful in the elderly by several groups [7, 9, 12, 16, 26] despite the observation that age is a consistent risk factor for conversion to open operation [8, 15, 22].

Although few other elderly specific laparoscopic studies have been reported in the literature, such studies will be increasingly important as our population continues to age. Careful selection of patients for operation, attention to medical comorbidities, and an understanding of the medical and other needs of the elderly are important variables to consider if a successful outcome is to be achieved [1, 13].

The results of this study and the prior report from Trus et al. [28] suggest that LARS can be performed safely and with a high degree of success in the elderly population. Although a relatively small number of elderly patients were evaluated in these studies, there were few serious complications; functional outcomes were good; and the failure rate of fundoplication was acceptably low. A number of elderly patients, however, did require diagnostic evaluation for symptoms postoperatively, which in most of the cases were unrelated to the wrap or their prior GERD.

Further studies should be carried out to validate the results of LARS and other advanced laparoscopic procedures in the elderly. However, we believe that laparoscopic antireflux surgery should be offered to patients with severe GERD who are carefully selected, and that age more than 65 years should not be a critical determinant in selecting patients for operation.

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