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Laparoscopic Antireflux Surgery for the Elderly: A Surgical and Quality-of-Life Study

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Abstract

Purpose. Laparoscopic antireflux surgery (LARS) has long been introduced as an alternative method for the treatment of gastroesophageal reflux disease (GERD) in young adults. However, the safety of this procedure and the associated improvement in the quality of life for the elderly are rarely discussed. This study compared the results between young and elderly patients who underwent laparoscopic fundoplication for the treatment of GERD.

Methods. From January 1999 to January 2006, there were 231 adult patients who underwent LARS for GERD at a single institute. Among all patients, 33 patients were older than 70 years old (14.3%, 73.0 ± 1.9, range 70–76), 198 patients were younger than 70 years old (85.7%, 46.6 ± 11.5, range 20–69). The clinical characteristics, operation time, postoperative hospital stay, surgical complications, and quality of life were retrospectively analyzed.

Results. The mean operation time had no significant difference between the younger group and the elderly group. The mean postoperative hospital stay in the elderly group was slightly longer than the younger group (4.1 ± 2.5 days vs 3.4 ± 1.3 days, $P = 0.19$). There were no mortalities and no major complications found in each group. No patients required conversion to an open procedure. Four patients had minor complications (three in the elderly group, rate: 9.0%; one in the younger group, rate: 0.5%, $P < 0.05$). There were two patients in the nonelderly group who had recurrence. A comparison of the preoperative and postoperative Gastro-Intestinal Quality of Life Index (GIQLI) scores showed significant improvements (99.3 ± 19.2 points, and 110.2 ± 20.6 points, respectively, $P < 0.05$) with no significant difference between the two groups.

Conclusion. Laparoscopic antireflux surgery thus appears to provide an equivalent degree of safety and symptomatic relief for elderly patients with GERD as that observed in young patients.

Key words Reflux esophagitis · Laparoscopy · Fundoplication · Old age

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Introduction

Gastroesophageal reflux disease (GERD) is a common clinical problem that results in high medical care expenses. The surveys indicate that almost 45% of American adults experience heartburn, the cardiac symptom of GERD, at least once a month and 7% are reported to have such symptoms on a daily basis. The incidence of GERD in Taiwan has grown steadily in the past years and it is therefore considered to be underestimated clinically. According to endoscopic surveillance, the rate of erosive esophagitis in Taiwan increased from 2.4% in 1979 to 14.5% in 1997.[1,2]

Management for GERD includes lifestyle and diet modification, drugs that inhibit gastric acid output, and surgery. The first laparoscopic antireflux surgery was reported in 1991.[3,4] Since then a laparoscopic approach has proven to be as effective as the open method, while also reducing the morbidity rate and hospital stay.[5–12]

As life expectancy increases, the number of elderly patients presenting with surgical correctable GERD has increased as well. However, with underlying chronic diseases more prevalent in the elderly, they could increase the operative risks for elderly patients. Old age had been regarded as a relative contraindication for laparoscopic surgery. Several studies have reported that laparoscopic antireflux procedures can be safe and effective in the elderly,[13–19] but no supporting data are currently available from oriental countries.

We started to perform laparoscopic antireflux surgery for the treatment of gastroesophageal reflux disease in 1998.[20] One of our previous studies reported that laparoscopic antireflux surgery is as safe and effective as open procedures in treating GERD in Taiwanese patients.[21] Whether it can be as safe and effective in the elderly patients as in younger patients in Taiwan has still not yet been well studied. The objectives of this study are to retrospectively compare patients receiving laparoscopic antireflux surgery who are older than 70 years of age to those younger than 70 years of age, and to assess their surgical outcomes and improvements in the gastrointestinal quality of life index.

Patients and Methods

Patients

Between January 1999 to January 2006, 231 consecutive patients who received laparoscopic antireflux surgery in our hospital under the diagnosis of GERD were included in this study. Thirty-three patients were older than 70 years of age, with a mean age of 73.0 ± 1.9 years (range: 70–76 years), and 198 patients were younger than 70 years of age, with a mean age of 46.7 ± 11.5 years (range: 20–69 years). The pre-operative work-up included endoscopy, barium swallow, esophageal manometry, and 24-h pH studies. All patients received laparoscopic antireflux procedures (including Nissen and Toupet fundoplication) after demonstrating a failure of 2-year medication control.

Surgical Techniques

All operations were performed laparoscopically using the five-trocar approach. The gastric fundus was widely mobilized by dividing the short gastric vessels using the harmonic scalpel (Ethicon Endosurgery, Cincinnati, OH). The hiatal hernia was documented by preoperative esophagograms, and endoscopic and intraoperative findings. Patients who had a hiatal hernia received a reduction of herniated stomach and the hernia sac was removed. The esophageal hiatus was reconstructed when necessary. The Nissen fundoplication was 2.5–3.0 cm long, secured with three to four nonabsorbable stitches (according to the size of the hernia), and floppy. An endoscope was placed in the esophagus for calibration. In patients who received the Toupet technique, the posterior wrap was fixed to the right crus and afterwards to the right side of esophagus. The corresponding part of the fundus was then fixed to the left side of the esophagus. In the first 33 patients, laparoscopic Toupet fundoplication was the choice of treatment. However, we changed our methodology to Nissen fundoplication afterwards, and the Toupet procedure was applied only to patients with an impaired esophageal motility on a manometric study, and 10 patients received this procedure afterwards. The surgical outcome including the operation time, postoperative hospital stay, mortality, and complications were collected by retrospective chart reviews.

Quality of Life Assessment

The Gastro-Intestinal Quality-of-Life Index (GIQLI) was utilized to evaluate the improvement of symptoms for our patients in the study. GIQLI is a 36-item-questionnaire divided into five domains: core symptoms (10 items), physical status (7 items), psychological emotions (6 items), social functioning (3 items), and disease-specific symptoms (10 items). Each item is evaluated from 0 to 4 (0 being the worst and 4 being the best). The maximum score is 144. The patients were asked to fill out a life quality questionnaire evaluation before surgery and 3 months after surgery.

Statistical Analysis

The results were reported as the mean ± standard deviation. Values of $P < 0.05$ were regarded as statistically significant. All data were recorded on standardized data collection forms, which were then transferred into a commercially-available electronic database system for personal computers and analyzed by the SPSS statistical software program 10.0 for Windows (SPSS, Chicago, IL, USA).

Results

The demographic and preoperative features of the two groups of patients are shown in Table 1. Differences between the two groups were seen in their averaged height and body weight ($P = 0.001$ and 0.026, respectively), but the mean BMI had no significant difference ($P = 0.98$). Forty-three patients received laparoscopic Toupet fundoplication with 9 patients in elderly and 34 patients in the nonelderly group, and the other 188 patients had Nissen fundoplication with 24 in the elderly and 164 patients in the nonelderly group. The mean follow-up was 30.01 months. The operative and preoperative results for the two groups are given in Table 2. There was no significant difference in the operative time ($P = 0.79$) with the elderly group averaging 130.4 ± 37.4 min (range: 75–265 min), whereas the mean operative time in the younger group was 132.7 ± 38.5 min (range: 65–295 min). Regarding hospital stay, the length of postoperative hospital stay in the elderly was 4.1 ± 2.5 days (range: 2–13 days) in comparison to the 3.4 ±

Table 1. Demographics of the patients

	Elderly (≥70 years) $n = 33$	Nonelderly (<70 years) $n = 198$	P value
Sex	M: 12 F: 21	M: 127 F: 71	
Age	Mean: 73.04 ± 1.89 Range: 70–76	Mean: 46.61 ± 11.48 Range: 20–69	
Body height	Mean: 156.3 ± 10.37 Range: 137–175	Mean: 164 ± 9.89 Range: 133–187	0.001**
Body weight	Mean: 60.65 ± 11.41 Range: 43–82	Mean: 67 ± 12.7 Range: 34.8–112.5	0.026*
BMI	Mean: 24.8 ± 3.6 Range: 14.1–29.8	Mean: 24.8 ± 3.7 Range: 14.7–37.6	0.98

BMI, body mass index
* $P < 0.05$, ** $P < 0.01$

Table 2. Surgical outcomes and complications

	Elderly (≥70 years) $n = 33$	Nonelderly (<70 years) $n = 198$	P value
Hospital stay (days)	Mean: 4.1 ± 2.5 Range: 2–13	Mean: 3.4 ± 1.3 Range: 1–9	0.19
Operation time (min)	Mean: 130.4 ± 37.4 Range: 75–265	Mean: 132.7 ± 38.5 Range: 65–295	0.79
Complication			<0.01
Minor	9.0% (3)	0.5% (1)	
Major	0	0	
Mortality	0	0	

1.3 days (range: 1–9 days) surveyed in the younger group. Hence, the two groups demonstrated no significant difference in postoperative hospital stay ($P = 0.19$) either.

There was no mortality in our series and no patients required conversion to open procedures. There were no severe complications such as splenic injury, postoperative bleeding, and perforation of alimentary tract. Only four patients had minor complications (three in the elderly group, rate: 9.0%; one in the younger group, rate: 0.5%). Two of these four patients experienced pneumonia postoperatively but they were successfully controlled by antibiotics. Another complication occurred in a 76-year-old woman, who experienced prolonged dysphagia and vomiting after the surgery. Her condition improved by diet modification. The only complication found in the younger group was subcutaneous emphysema which required no further treatment. Out of all the patients studied, only two were found to have recurrence. Both of them were in the younger group. One patient received the Toupet procedure, and revision surgery showed a disruption of the previous suture. Another patient had slippage of stomach through fundoplication.

Quality of Life

There were 82 (35.5%) patients who filled out the preoperative GIQLI questionnaire (71 in the younger group, rate: 35.9%; 11 in the elderly group, rate: 33.3%). In addition, 89 patients completed the GIQLI questionnaire 3 months after the laparoscopic antireflux surgery (LARS) (74 in the younger group, rate: 37.4%; 15 in the elderly group, rate: 45.5%). The comparison of preoperative and postoperative GIQLI score of all patients is shown in Table 3. Preoperatively, the mean general score of GIQLI for all patients was 99.3 ± 19.2 points. The mean scores for the five domains were: core symptoms, 22.9 ± 5.9 points; emotional status, 12.1 ± 5.0 points; physical functions, 18.4 ± 5.7 points; social functions, 14.8 ± 4.0 points; and disease-special items, 31.1 ± 5.5 points. Three months after LARS, the mean general score improved significantly to 110.2 ± 20.6 points ($P < 0.05$). The mean scores for the five domains were: 24.8 ± 6.0 points in core symptoms, 15.1 ± 4.3 points in emotional status, 20.9 ± 5.4 points in physical functions, 16.3 ± 3.9 points in social functions, and 33.0 ± 4.7 points in disease-special items.

Table 3. Comparison of the preoperative and postoperative Gastro-Intestinal Quality of Life Index scores

Item	Preoperative <70 years old	Preoperative >70 years old	Postoperative <70 years old	Postoperative >70 years old
Symptoms				
Abdominal pain	2.8	3.2	3.2	3.5
Abdominal fullness	2.2	2.2	2.8	2.9
Abdominal bloating	2.1	2.5	2.4	3.0
Flatulence	2.6	2.4	1.8	2.4
Belching	2.7	3.0	3.0	3.3
Abdominal noises	3.0	3.4	3.0	3.7**
Bowel frequency	3.1	3.6	3.4**	3.9*
Enjoyed eating	1.8	1.8	1.9	2.0
Restricted eating	2.0	2.1	2.7	2.7
Regurgitation	2.9	2.4	3.5*	3.0*
Dysphagia	3.2	3.3	2.7*	2.9
Eating speed	3.0	2.9	2.6	2.5*
Nausea	2.9	2.8	3.5	3.5
Diarrhea	3.0	3.3	3.2	3.6
Bowel urgency	3.3	3.4	3.4	3.7
Constipation	3.3	3.0	3.2	2.6
Blood in stool	3.8	3.7	3.8	4.0
Heartburn	2.3	2.6	3.3**	3.5*
Incontinence	3.8	3.6	3.9	3.5
Emotional status				
Coping with stress	2.1	2.2	2.5	2.8
Sadness	2.1	2.7	2.9	3.4
Nervousness	2.4	2.8	3.1	3.6
Frustration	2.6	2.8	3.2	3.5
Happiness	2.4	3.0	3.0**	3.7*
Physical functions				
Fatigue	2.7	2.8	2.8	3.1
Feeling unwell	2.0	2.2	2.8	2.9
Wake-up at night	2.5	2.6	2.9	3.2
Appearance	3.3	3.7	3.5	3.9
Physical strength	2.7	2.9	2.8	3.0
Endurance	2.4	2.5	2.9	2.9
Feeling unfit	2.6	2.6	3.0	2.9
Social functions				
Daily activities	3.0	3.0	3.2	3.4
Leisure activities	2.9	3.0	3.2	3.1
Bothered by treatment	2.4	2.6	3.0	3.3
Personal relationship	3.3	3.6	3.5	3.7
Sexual life	3.2	2.7	3.4	3.1

* $P < 0.05$, ** $P < 0.01$; significant in comparison to the preoperative data

Comparisons of the preoperative and postoperative GIQLI scores in the two age groups were made. The preoperative general score was 98.8 ± 18.6 points in the younger group and 102.4 ± 25.0 points in the elderly group. There was no significant difference between the two age groups regarding the preoperative GIQLI scores. Similar results were also revealed in a comparison of the postoperative GIQLI scores. The postoperative general score was 109.1 ± 20.5 points in the younger group and 115.4 ± 20.9 points in the elderly group.

Discussion

Gastroesophageal reflux disease is commonly found among adults, with 10%–20% of the Western population having daily symptoms. Although GERD affects all age groups including the elderly, it has not been studied extensively in older individuals. However, as life expectancy increases, the prevalence of elderly patients with GERD will rise as well. Several studies have suggested that elderly patients with GERD are likely to have

more severe esophageal mucosal disease than younger group does,[22,23] thus it is of relevant importance to evaluate the treatment of GERD in elderly patients.

Despite the good response rate of modern antisecretory therapy, GERD can only be cured by surgery. Since the 1990s, LARS has become an effective and safe option for the treatment of patients with severe or complicated GERD. Several studies have shown excellent surgical outcomes with a healing rate of 85%–100%, and a low percentage of morbidity and mortality.[5–8,24,25] However, few such studies have discussed their experiences with elderly patients. Do the underlying chronic diseases, which are more prevalent in the elderly, pose an increase in the elderly patients' operative risk? Whether LARS can be performed safely and effectively in elderly patients as in younger patients has not yet been well discussed in existing studies.

With the few studies that brought up the discussion on the effect and safety of LARS in the elderly patients with GERD, all of them reported similar surgical results between the elderly group and nonelderly group including similar operation time, postoperative hospital stay, and low morbidity and mortality.[13,14,19,26] Our study also demonstrated similar results with a mean operation time and postoperative hospital stay showing no significant difference between the two groups. There was no mortality or major operative complications in our study either. The results in our studies are similar to those of reports form Western countries.[24,25] Although in our study the minor complication rate was significantly higher in the elderly group than in the nonelderly group (8.7% vs 0.7%), it was because the complication rate in the nonelderly group was low in our study. The complication rate in the elderly group of our study was comparable to other series (5.6%–16.7%).[19,26] There are two procedures performed in our study. In the beginning of our practice, we chose Toupet fundoplication as choice of treatment.[28] However, we changed to Nissen fundoplication as first choice of treatment, unless an impairment of esophageal motility was seen in the patients, after the first 33 cases. Comparisons between two procedures are therefore not made because the indications for the choice of operation differ depending on the time when the first choice of surgical procedure is changed to Nissen fundoplication.

In evaluating the quality of life of the GERD patients, scales such as SF36, well-being score, and GIQLI are amongst the common tools used. The GIQLI, first published in the German version in 1993 and English version in 1995,[29] is the only validated tool to assess specific quality of life in patients with various gastrointestinal diseases.[30,31] For our study, we used GIQLI to evaluate the life quality improvement of the patients. It is well established, validated, and has been recommended by the European Study Group for Antireflux Surgery. In our study, both groups demonstrated significant improvements after LARS. In addition, there were no statistical differences between the elderly and the nonelderly postoperatively regarding the GIQLI score. The elderly patients even presented greater improvements in the aspects of abdominal noises (3.7 vs 3.0; $P < 0.01$), bowel frequency (3.9 vs 3.4; $P < 0.01$), blood in stool (4.0 vs 3.8; $P < 0.001$), and happiness (3.7 vs 3.0; $P < 0.05$).

Our study demonstrates that good functional results also can be obtained in elderly patients undergoing antireflux surgery using a laparoscopic approach. Therefore, patients older than 70 years old should not be a contraindication to laparoscopic antireflux surgery in properly selected patients. It should thus be widely adopted if the expertise in the area of laparoscopic surgery is available for this group of patients. Further studies should be carried out to evaluate the long-term outcome, cost-effectiveness and quality of life in these patients.

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