

Outcomes of Minimally Invasive Antireflux Operations in the Elderly: A Comparative Review

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ABSTRACT

Background and Objectives: The objectives of this study were to assess the impact of age following laparoscopic fundoplication (LF).

Methods: From March 1993 to November 1998, 193 patients underwent LF. Patients comprised 150 young individuals (age < 60; median 41) and 43 older individuals (age > 60; median 68). Follow-up included heartburn scores, dysphagia scores, and quality of life determined by the Short Form 36 Health Survey (SF36).

Results: Older patients had more cardiac disease, psychiatric disorders, prior cancers, and upper abdominal operations ($P < 0.05$). DeMeester scores were similar (young 70/older 69). Complications occurred in 13 (8.7%) of the young and 5 (11.6%) of the older patients ($P = 0.142$). No perioperative deaths occurred. Length of stay was longer ($P < 0.000$) in older patients (2.9 versus 1.6 days); resumption of oral intake (young -1.2; older -1.3 days) and return to normal activity (young -3.6; older -4.4 weeks) were similar. Follow-up was available in 102 young (median 17 months) and 35 older (median 18 months) patients. Heartburn and dysphagia scores were excellent in both groups. SF36 scores were similar in both groups. Only 6 (5.9%) of the young group and 1 (2.9%) of the older group were dissatisfied ($P = 0.652$).

Conclusions: Despite differences in comorbid disease, outcomes were similar in both groups. LF should be considered a therapeutic option in the older patient with reflux.

Key Words: Gastroesophageal reflux, Outcomes, Antireflux operation, Elderly.

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INTRODUCTION

Gastroesophageal reflux disease (GERD) is one of the most common chronic disorders of the gastrointestinal (GI) tract that affects about 44% of Americans to some degree, with an estimated 18% of patients using nonprescription drugs.¹ The majority of patients will get symptomatic relief with proton pump inhibitors (PPI); however, some patients will continue to remain symptomatic, or develop a complication of reflux, such as erosive esophagitis, bleeding, stricture or Barrett's disease that will require surgical intervention. In young patients who are facing life-long PPI therapy, surgery is usually undertaken. In an older population, the role of surgery is more controversial. This study was performed to assess the impact of age on outcomes after minimally invasive antireflux surgery performed at our center. In particular, we wished to compare the effect of surgery on quality of life (QOL).

MATERIALS AND METHODS

A retrospective analysis was performed of patients operated on over a 5-year period (March 1993 through November 1998). Our standard operative approach has been previously described.² Briefly, this includes full crural dissection, approximation of the crura posterior to the esophagus, division of the short gastric arteries, removal of the esophageal fat pad, and a 360° wrap performed over a bougie (48-60 F). Since April 1998, a Collis gastroplasty³ performed laparoscopically has been included, if a tension-free wrap around at least 2 cm to 3 cm of intraabdominal esophagus below the diaphragm is not possible.

Patients were divided into 2 groups based on the definition in section 3002 of the Older Americans Act, which defines "older individuals" as an individual of 60 years of age or older. The young group included patients less than 60 years and the older group included patients 60 years or above. Detailed outcome measurements included heartburn severity determined by using the gastroesophageal Reflux Disease-Health Related Quality of Life Scale (HRQOL). This is a disease-specific instrument designed by Velanovich et al,⁴ which consists of 10 questions. Nine relate to aspects of GERD with each response

scored from 0 to 5. The best possible score is 0, and the worst possible score is 45. Initial reports of this instrument suggest preoperative scores of 28. The tenth question relates to an overall assessment of satisfaction. Dysphagia was recorded by using a scale from 1 (no dysphagia) to 5 (severe dysphagia). The Short Form 36 Health Survey (SF36) was used as a measure of global QOL. This instrument designed by Ware and Scherbourne⁵ has been extensively validated and tested with population normal values identified.

SF36 responses were entered into an outcomes analyzer program (Assist Technology, Scottsdale, Arizona). From these raw scores, physical component summary scores (PCS) and mental component summary scores (MCS) were calculated. The United States normal values for both the PCS and MCS scores is 50.

The data were analyzed by Mann-Whitney *U* tests to test for outcome differences between young and older patients.

RESULTS

Minimally invasive antireflux surgery was performed in 193 patients. This included 186 (96.4%) who underwent laparoscopic Nissen fundoplication and 7 (3.6%) who underwent laparoscopic Nissen fundoplication with the addition of a Collis gastroplasty because of a shortened esophagus. The young group included 150 patients with a median age of 41 (range 15 to 59) years. Eighty-three (55%) were men and 67 (45%) were women. The older group included 43 patients with a median age of 68 (range 60 to 80) years. Twelve (28%) men and 31 (72%) women were in this group. Mean preoperative esophageal amplitude pressures and lower esophageal sphincter pressures were 71 and 9.5 in younger patients and 63 and 12.8 in older patients. DeMeester scores were 69 in the young group and 71 in the older group. GERD symptoms were present for more than 12 months in 117 (78%) of the young group and 36 (84%) of the older group. The older patients had a greater incidence of comorbid diseases with more cardiovascular disease (30% versus 8%, $P=0.000$), previously treated cancers 19% versus 5%, $P=0.006$, and a greater incidence of psychiatric disorders (28% versus 13%, $P=0.044$). Additionally, the older patients had a significantly ($P<0.002$) greater number of prior upper abdominal operations with 16 (37%) compared with 20 (13%) in the younger group. The incidence of Barrett's disease was similar ($P=0.849$) for both

groups and was present in 37 (25%) of the young patients and 10 (23%) of older patients.

No deaths occurred following surgery in either group. Morbidity occurred in 13 (8.7%) of the younger and 5 (11.6%) of the older patients ($P=0.142$). These complications are outlined in **Table 1**. Two esophageal perforations occurred. In 1 patient, this was caused by the passage of a bougie in the proximal esophagus and was repaired by thoracotomy. The second patient presented with a delayed perforation, despite a normal postoperative swallow. This required open surgery and drainage with ultimately a successful outcome.

Mean length of stay was less ($P=0.000$) for the young group at 1.6 compared with 2.9 days for the older group. Time to oral intake was similar ($P=0.140$) for the younger group (1.2 days) and older group (1.3 days). Return to normal activity was also similar ($P=0.226$) for young patients (3.6 weeks) and older patients (4.4 weeks).

Detailed follow-up including the outcome measures of heartburn severity and QOL were available in 137 patients (young 102/older 35) at a median of 17 (11 to 63) months for the younger patients and 18 (12 to 79) months for the older patients. Typical reflux symptoms of heartburn, regurgitation, waterbrash, dysphagia, and chest pain are outlined in **Table 2**. No significant differences occurred between groups. No significant differences occurred in the requirement for proton pump inhibitors (PPI, Cisapride, and H2 antagonists (**Table 3**)). Outcome scores are shown in **Table 4**. Mean heartburn (HRQOL) scores were excellent in both groups. Mean dysphagia scores were normal in both groups. PCS and MCS scores were also similar when comparing both groups to each other and also to United States normal values.

Only 6 (5.9%) of the young patients and 1 (2.9%) of the older patients were dissatisfied ($P=0.652$). Reoperation was required in 3 young group patients. Two patients had slipped wraps. Both of these reoperations were performed laparoscopically, with 1 reoperation including a Collis gastroplasty. The third patient underwent reoperation at another facility.

DISCUSSION

Since the first Nissen fundoplication was performed laparoscopically in 1991,⁶ the number of centers performing this procedure has increased at an exponential

Table 1.
Postoperative Complications

Complication	Young Group (Occurred in 13/150)	Older Group (Occurred in 4/43)
Esophageal perforation	1	1
Pneumothorax	1	1
Diaphragm avulsion	1	0
Atrial fibrillation	1	0
Atelectasis	3	1
Pneumonia	1	0
Clostridium difficile colitis	0	1
Pulmonary embolus	3	1
Superficial wound infection	1	0
Pancreatitis	0	1
Gastric dilation	1	0
Readmission dehydration/vomiting	2	0

Table 2.
GERD Symptoms Present at Follow-up

Group	Heartburn	Regurgitation	Waterbrash	Dysphagia	Chest Pain
Young (n=102)	24 (24%)	9 (9%)	9 (9%)	17 (17%)	14 (14%)
Older (n=35)	9 (26%)	4 (11%)	5 (14%)	3 (9%)	6 (17%)
P value	.638	.712	.233	.068	.224

rate. Laparoscopic fundoplication has been shown to be a safe procedure that can be performed with acceptable early results. Perdakis et al⁷ pooled the data from several reports and demonstrated that in 2453 patients, overall mortality was 4 (0.2%) and that intraoperative complications occurred in 104 (4.2%) patients of which 25 (1%) of the complications were esophageal perforations. The exact incidence of postoperative complications was not detailed in this report, although some of these complications were described. Our early results are in keeping with this and other reports, with no mortality in either surgical group and complications occurring in 8.7% of younger patients and 11.6% of older patients.

The role of surgery, however, remains controversial, particularly for older patients. Heudebert et al⁸ published a cost-utility analysis comparing LF to PPI use. Their conclusions were that medical therapy should be the pre-

ferred treatment strategy for most patients, with LF being reserved for good candidates with a long life expectancy. GERD, however, appears to occur more frequently in older populations.⁹ Additionally, the severity of GERD is worse, with more esophagitis and Barretts disease reported,¹⁰ although this was not seen in our study. A review of the outpatient database of a large health maintenance organization (HMO) demonstrated an increasing prevalence of GERD in patients greater than 65 years of age.¹¹ Additionally, the authors estimated that for the 2.4 million members enrolled in the HMO, the annual expenditure for acid-related diseases was 59.4 million dollars with 40.6% of this required for the treatment of GERD.

Apart from the issues of the prevalence of GERD, treatment costs, and disease severity, QOL should also be considered when surgery is planned. Many GERD patients will require daily medications. In many cases,

Table 3.
GERD Medication Use at Follow-up

Group	Proton Pump Inhibitors	Cisapride	H2-Antagonists	Antacids
Young (n=102)	19 (19%)	4 (4%)	6 (6%)	5 (5%)
Older (n=35)	6 (17%)	1 (3%)	3 (9%)	5 (14%)
<i>P</i> value	.317	.874	.862	.066

Table 4.
Outcome Scores

Patient Group	HRQOL* Mean (SD) (0=None, 45=Severe)	Dysphagia† Mean (SD) (1=None, 5=Severe)	SF36: PCS‡§ Mean (SD) (Normal=50)	SF36: MCS‡ Mean (SD) (Normal=50)
Young (n=102)	3 (0.5)	1.3 (0.05)	49.5 (12.4)	49 (10)
Older (n=35)	3 (0.8)	1.0 (0.03)	48.6 (12.1)	49.6 (8.4)
<i>P</i> value	.827	.017	.496	.772

*HRQOL=Health Related Quality of Life.

†Although the dysphagia score was different statistically, clinically this was an insignificant difference; and both can be regarded as normal.

‡SF36 = Short Form 36 Health Survey.

§PCS=Physical component summary scores.

||Mental component summary scores.

size and frequency will need to be periodically increased with only partial relief of symptoms. Because older patients will have a greater incidence of comorbid diseases, with potentially increased operative risk, referring physicians are often reluctant to refer these patients for operation. Minimally invasive fundoplication, however, offers the opportunity to effectively control symptoms with acceptable risk, and significantly improve QOL. Initial evaluation indicated a higher than expected recurrence rate of heartburn symptoms for both groups. However, this may have been due to the close nature of follow-up with symptom questionnaires. This has been seen in a recent study from Sweden,¹² comparing open fundoplication with medical treatment where a failure rate of 31% was reported on the symptom questionnaire. Although 25% of our patients reported some heartburn, this was felt to be mild in nature. In both surgical groups, follow-up mean heartburn scores were only 3 on a scale from 0 to 45, indicating excellent heartburn control. Additionally, global QOL scores using the SF36 were sim-

ilar when both groups were compared with each other and with United States normal values. Only 5.9% of the younger group and 2.9% of the older group were dissatisfied with their treatment results.

CONCLUSION

In summary, our study demonstrates a higher incidence of comorbid disease in the older patient group, which was not unexpected. Despite these differences, laparoscopic fundoplication was associated with equally good outcomes as seen in the younger patient group. Minimally invasive fundoplication should be considered a therapeutic option in the older patient with symptomatic GERD

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