Clinical and Quality of Life Assessment of Patients Undergoing Laparoscopic Hiatal Hernia Repair

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INTRODUCTION

The role of reinforcing mesh in the repair of hiatal hernias is often debated. Synthetic mesh has been demonstrated to reduce recurrences, although mesh erosions have been reported and can be catastrophic. Prospective randomized trials utilizing biologic mesh materials have demonstrated a reduction in short-term recurrences. Polyglycolic acid / Trimethylene carbonate (PGA / TMC) mesh is an absorbable synthetic that may be utilized to reinforce the hiatal closure during repair. This study evaluates quality of life (QOL) and clinical outcomes of patients undergoing laparoscopic hiatal hernia repair (HHR) with PGA / TMC mesh.

METHODS

Our surgery database was queried to identify all patients that had undergone laparoscopic repair of hiatal hernia during the time period of August 1, 2012, through April 30, 2014, performed by the senior author (JSR) and which utilized PGA / TMC mesh.

Patient demographics, preoperative studies, intraoperative details, and postoperative outcomes were recorded. In addition, GERD Clinical Signs and Symptoms (GERD CSS) questionnaire (see right) responses were recorded and evaluated according to three time periods: 1) preoperative, not greater than 90 days; 2) postoperative, within six weeks; and, 3) postoperative, between six weeks and six months. For long-term results, a prospective administration of the GERD CSS survey was conducted over the phone from 15 to 40 months after surgery.

GERD CSS responses from the three postoperative time points and the long-term follow-up results were compared to preoperative responses.

Significance was set at p < .05 for all comparisons. SPSS statistical software (IBM Corp., Armonk, NY) version 22 was used for all calculations.

RESULTS

Table 1. Patient Characteristics

No. of patients	96
Mean age (years) ± SD	58.2 ± 14.8
% Female/Male	66/34
Mean BMI ± SD	30.3 ± 6.2
Recurrent hernia	6 (6%)
Fundoplication type	
Nissen	69 (72%)
Toupet	27 (28%)
Concomitant procedure*	28 (29%)
PEG placement	17 (18%)

SD, standard deviation; BMI, body mass index; PEG, percutaneous endoscopic gastrostomy
*most commonly resection of a mediastinal lipoma

Table 2. Outcomes by defect size

Outcome\ Defect Size	Large (> 5 cm)	Moderate – Small (≤ 5 cm)	p-value[1]
No. of Cases	**45**	**41**	
Mean Age (years)	65	51	< .001
Operative time (minutes)	169	143	.004
Readmission	4.4%	20%	.043
Recurrence			.369
Unknown	31%	21%	
No Recurrence	65%	70%	
Recurrence	4.2%	9.1%	
Postop Reflux			.675
Unknown	25%	18%	
No Reflux	69%	73%	
Reflux	6.3%	9.1%	

[1]t-test, ANOVA, Fisher's exact, chi-square test

Figure 1. Estimated marginal rates of clinical symptoms at given timepoints
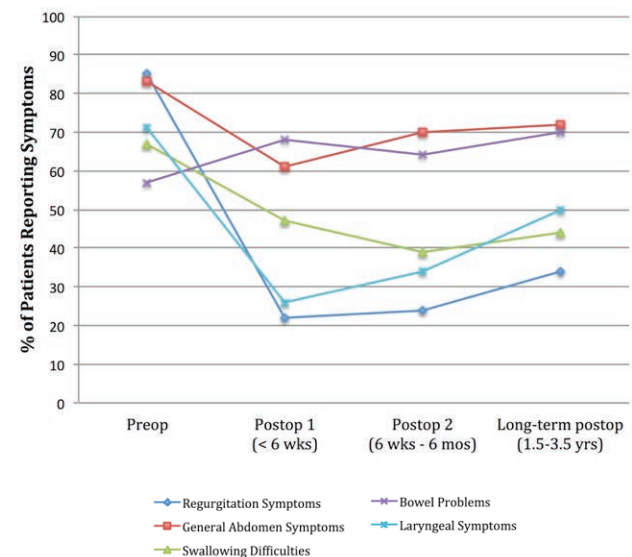
RESULTS (continued)

Table 3. Estimated marginal rates and severity of clinical symptoms (95% C.I.)

Variable	Preop (< 90 days)	1st postop visit (< 6 wks)	2nd postop visit (6 wks – 6 mos.)	Long-term postop#
No. of surveys	*87*	*84*	*53*	*50*
No. of symptoms	5.8	3.0***	3.1***	3.8***
% w/ REGURGITATION SYMPTOMS[1]	85 (75.8 – 91.2)	22*** (13.7-32.1)	24*** (14.0-37.9)	34*** (22.1-48.3)
Mean Severity on 1-10 scale	*6.6* (5.9-7.4)	*3.1**** (2.2-3.9)	*4.8* (2.9-6.7)	*4.5** (2.9-6.0)
% w/ GENERAL ABDOMEN SYMPTOMS[2]	83 (73-89)	61* (49-71)	70 (56-81)	72 (58-83)
Mean Severity on 1-10 scale	*6.6* (5.9-7.4)	*5.7*** (4.7-6.7)	*5.2** (4.4-6.1)	*6.9* (6.2-7.6)
SWALLOWING DIFFICULTIES	1.3 (1.0-1.5)	0.9* (0.7-1.2)	0.7** (0.4-0.9)	0.9 (0.6-1.2)
% 0. No Difficulties	33	53	61	56
% 1. Solids Dysphagia	29	21	20	16
% 2. Liquid Dysphagia	17	10	12	12
% 3. Painful Swallowing	22	17	8	16
% w/ BOWEL PROBLEMS[3]	57 (45-67)	68 (56-78)	64 (50-76)	70 (56-81)
Mean Severity on 1-10 scale	*6.8* (6.0-7.7)	*5.1*** (4.3-5.9)	*6.0* (4.9-7.1)	*6.0* (5.2-6.9)
% w/ LARYNGEAL SYMPTOMS[4]	71 (59-80)	26*** (17-37)	34*** (22-49)	50* (36-64)
Mean Severity on 1-10 scale	*6.5* (5.9-7.2)	*4.6*** (3.5-5.7)	*4.4*** (3.1-5.6)	*4.7*** (3.8-5.5)
ANTACID MEDICATIONS	83 (74-90)	32*** (21-45)	27*** (16-42)	40*** (27-54)

* indicates paired improvement over preop rate p < .05; ** p < .01; *** p < .001.
\# Median months of long term follow up was 27.1 years (interquartile range 23.0 – 32.9)
[1] Regurgitation Symptoms include vomiting, heartburn, regurgitation
[2] General Abdominal Symptoms: abdominal pain, nausea, bloating
[3] Bowel Problems: constipation, diarrhea
[4] Laryngeal Symptoms: hoarseness, chronic cough

Table 4. Symptoms by defect size across the three post-operative time period measurements

Symptom\ Defect Size	Large (> 5 cm)	Medium-Small (≤ 5 cm)	p-value*
No. of Cases	45	41	
No. of Symptoms	3.5	4.4	.013
% w/ REGURGITATION SYMPTOMS	34	49	.061
Mean Swallowing Score: 0 No difficulties 1 solids dysphagia 2 liquids dysphagia 3 painful swallowing	0.8	1.1	.027
% w/ LARYNGEAL SYMPTOMS	29%	63%	<.001
Antacid Meds	39%	53%	.074

* p-values reported are for variation of symptom across defect size. Numbers are estimates from a repeated measures general linear model.

DISCUSSION

Laparoscopic HHR has become the gold standard for symptomatic improvement of GERD. As such, the decreased rates of regurgitation symptoms and antacid use found in this study serve as additional evidence for the use of laparoscopic HHR as an antireflux procedure.[1] The use of mesh to reinforce the crura has been shown to decrease the rate of recurrence; however, at least one previous study has linked the use of biological mesh in HHR to an increased rate of esophageal stenosis.[2] This would likely manifest as swallowing difficulties in the patient. The results of this study indicate that patients undergoing laparoscopic HHR with PGA / TMC mesh do not perceive increased dysphagia postoperatively.

A significant symptomatic difference was seen postoperatively between the two defect size groups, as seen in Table 4. During follow up, the small-to-medium defects showed a significant increase in total number of symptoms, dysphagia-related scores, and percentage experiencing laryngeal symptoms when compared to the large defect group. Although not statistically significant, the data also indicates an increased rate of regurgitation symptoms and use of antacid medication as well. Furthermore, these increased symptoms were reflected in outcomes. The results in Table 2 suggest a significant increase in readmission rates among patients who had laparoscopic HHR on small-to-medium defects. Additionally, there was an increased rate of radiographic recurrence and postoperative reflux; however, these differences were not significant.

Previous research at our institution has shown similar trends, but these results were never found to be significant.[3] The unfortunate lack of long-term follow-up creates an obstacle that hinders our understanding of these outcomes; nevertheless, the trends indicated by the symptomatic differences and outcomes by defect size have clinical significance and, as such, merit further research. If there is indeed a discrepancy between these outcomes, further understanding of the mechanism could lead to a better understanding of outcomes and possibly indicate alternative surgical methods.

CONCLUSIONS

As indicated by patient-reported surveys, patients undergoing HHR with PGA / TMC mesh experience improved regurgitation and laryngeal symptoms, and decreased use of antacid medication. In addition, patients with small-to-moderate hiatal defects experience worsened postoperative reflux symptoms and clinical outcomes.

REFERENCES

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