

Minimally Invasive Paraesophageal Hernia Repair in the Elderly: Is Age Really Just a Number?



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Introduction

A paraesophageal hernia is defined as herniation of the stomach or other abdominal contents through the esophageal hiatus of the diaphragm into the thoracic cavity. They are characterized based on the location of the gastroesophageal junction and herniated contents. Paraesophageal hernia repair has been a topic of interest within the surgical community due to questions of safety regarding intervention in the elderly. As paraesophageal hernias most commonly affect patients between the ages of 65-75, and with the US Census Bureau estimating that adults over 65 will compose 25% of the population² in 2060, this disease will only become more prevalent in the future. With the advent of laparoscopic surgery, we wanted to investigate whether age is an independent risk factor for perioperative morbidity and mortality follow laparoscopic paraesophageal hernia repair

Materials / Methods

We performed a retrospective review of a prospectively maintained IRB-approved database of 143 patients who underwent laparoscopic or robotic PEHR between April 2007 and July 2018. Revisional repair were excluded. Patients were stratified into 3 cohorts according to age. Group A included patients less than 65 years old, Group B included patients between 65 to 80, and Group C was patient's over 80. A non-elective repair was defined as surgical repair occurring within an acute admission. Indications for non-elective repair included incarceration and acute bleeding. Collected patient characteristics are listed in Table 1. Measured post-operative outcomes are listed in Table 3. Recurrences were defined as radiologic or symptomatic. Univariate analysis was performed using Pearson's Chi-square test for categorical variables and one-way ANOVA for scale variables. All *p*-values were considered statistically significant when the associated probability was less than 0.05. IBM SPSS Statistics version 25 for Windows (IBM, Inc., Armonk, NY, USA) was used for statistical analysis.

Tables and Figures

Table 1: Patient characteristics					
		Age-stratified group			p-value
		Group A (<65) (n=49)	Group B (65>, <80) (n=76)	Group C (≥80) (n=18)	
Gender	Male	21	15	5	0.020
	Female	28	61	13	
ASA classification	1	0	0	0	0.198
	2	26	33	5	
	3	20	40	13	
	4	2	1	0	
	Unknown	1	2	0	
BMI (kg/m2) (mean)		28.4	27	25.1	0.048
Δ BMI DOS to last follow-up		-0.41	-0.91	-0.25	0.613
Non - elective		1	2	3	0.018
Hernia type	Type 2	0	1	0	0.320
	Type 3	47	71	15	
	Type 4	2	4	3	
ASA: American Society of Anesthesiologists, BMI: Body mass index, DOS: Date of surgery					

Table 2: Medical comorbidities					
		Group A (n=49)	Group B (n=76)	Group C (n=18)	p-value
CCI (mean)		2	3.61	5.28	<0.001
Hypertension		23	50	14	0.031
DM		4	11	1	0.396
CHF		1	4	0	0.435
Ischemic heart disease		1	8	6	0.001
Liver disease		9	1	0	0.001
Hyperlipidemia		15	35	9	0.167
COPD		3	9	5	0.053
Cancer		4	16	6	0.039
CCI: Charlson Comorbidity Index, DM: Diabetes Mellitus, CHF: Congestive heart failure, COPD: Chronic Obstructive Pulmonary Disease					

Table 4: Symptom resolution post-procedure					
	Improvement rate (%)	Total patients reporting symptom improvement			p-value
		Group A (<65)	Group B (65≤, <80)	Group C (>=80)	
All symptoms (n=142)	66.2	37	44	13	p=0.129
Anemia (n=48)	52.1	9	12	4	p=0.134
Epigastric or chest pain (n=66)	87.9	23	31	4	p=0.672
Dysphagia (n=60)	76.7	15	24	7	p=0.648
Heart burn (n=64)	84.4	18	29	7	p=0.422
Weight loss (n=10)	70	4	0	3	p=0.040
Short of breath (n=31)	93.5	8	14	7	p=0.367
Belching (n=14)	100	4	9	1	-
Early Satiety (n=10)	100	4	6	0	-

Table 3: Patient Outcomes				
	Group A (n=49)	Group B (n=76)	Group C (n=18)	p-value
Complication (Clavien-Dindo ≥3)	2	8	1	0.392
Clavien-Dindo ≤ 2	2	11	6	0.007
Mortality	0	1	0	0.642
LOS (days)	2	1.8	2.8	0.222
Recurrence	13 (26.5%)	19 (25.0%)	2 (11.1%)	0.389
Reoperation	7 (14.2%)	4 (5.3%)	0	0.077

Discussion

Paraesophageal hernias remain an important clinical entity in the elderly population due to its prevalence, complexity of repair, and increased mortality and morbidity associated with acute and emergent presentations. This is compounded by the elderly's increased frequency of acute presentation and their often less than ideal surgical candidacy³.

In our study we were able to demonstrate that there was no difference in mortality or major complications between our elderly and younger patient populations despite their higher CCI scores and co-morbidity burden. Major complications were defined as a Clavien-Dindo Score equal to or greater than 3 and included DVT, aspiration pneumonia, and pneumothorax. A contributor to this result may be our institution's peri-operative screening protocol. We require cardiac clearance for patients over the age of 65 as well as a pulmonology consult for those with respiratory illnesses. A difference was seen in minor complications evident with our elderly patient's having a higher rate at 33%. Similar results have been seen in other studies such as Spaniolas et al's review of 2681 patients whom 11.7% were over the age of 80 where no difference in mortality or major morbidity was seen¹.

No difference in recurrence was seen between the different age groups. The overall recurrence rate at 23% and is similar to recurrence rates reported in the literature⁴. The majority of patients reported improvement with their post-operative symptoms, however only weight loss was shown to be statistically significant likely due to the small number of reporters.

With these demonstrated results laparoscopic paraesophageal hernia repair is both safe and efficacious in the elderly population and age is truly just a number.

Disclosures

Dr. Horgan is a consultant for Stryker Corporation, Intuitive Surgical, Fortimedix Surgical, and Medtronic. Dr. Sandler is a consultant for Intuitive Surgical and Boston Scientific. Dr. Jacobsen receives a teaching honorarium from Gore Medical. Drs. Cheverie, Neki, Lee, Li, Dominguez-Profeta, Broderick, and Matsuzaki have no conflicts of interest or financial ties to disclose.

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