Risk Factors for Adverse Outcomes Following Paraesophageal Hernia Repair Among the Obese Population

Christine E. Alvarado MD[1], Joshua L. Lyons MD[1], Marco-Jose Rivero BA[1], Carolyn Vekstein BS[1], Nithya Kanagasegar BS[1], Iris Levine[2], Christopher W. Towe MD[1], Stephanie G. Worrell MD[3], Jeffrey M. Marks MD[4]

University Hospitals

[1] – Division of Thoracic and Esophageal Surgery, Department of Surgery, University Hospitals Cleveland Medical Center and Case Western Reserve University School of Medicine, Cleveland, OH, USA
[2] – The Ohio State University, Columbus, OH, USA
[3] – Section of Thoracic Surgery, Department of Surgery, University of Arizona, Tucson, AZ, USA
[4] – Division of General and Minimally Invasive Surgery, Department of Surgery, University Hospitals Cleveland Medical Center and Case Western Reserve University School of Medicine, Cleveland, OH, USA

UH RISES
Research in Surgical Outcomes and Effectiveness

Background

Obesity is an established risk factor for adverse outcomes following paraesophageal hernia repair (PEHR).

As a consequence of the obesity pandemic, many obese patients will nonetheless receive PEHR.

The purpose of this study was to explore predictors for poor outcomes among this high-risk patient population.

We hypothesized that obese patients undergoing PEHR would have unique risk factors for adverse outcomes.

Methods

A retrospective review of a high-volume, academic medical center was performed of consecutive, adult obese patients who underwent laparoscopic PEHR from 2017-2019.

Patients were excluded for a BMI <30 or if they received concomitant bariatric surgery at the time of PEHR.

The primary outcome of interest was a composite adverse outcome (CAO) defined as having any of the four following outcomes after PEHR: persistent GERD >30d, persistent dysphagia >30d, evidence of recurrence on imaging, or reoperation.

Multivariable logistic regression analysis was used to evaluate independent predictors of having a CAO using covariates identified by backwards selection.

Results

139 patients met inclusion criteria with a median follow-up of 19.7 (IQR 8.8-81) months. Among them, 51/139 (36.7%) had a postoperative CAO.

Table. Patient and surgical characteristics of cohort.

	No Composite Adverse Outcome (n=88)	Composite Adverse Outcome (n=51)	p value
Timing of surgery			0.08
Elective	83 (94.3%)	51 (100.0%)	
Urgent	5 (5.7%)	0 (0.0%)	
Obesity class			0.24
1 (BMI 30.0-34.9)	53 (60.2%)	36 (70.9%)	
2 (BMI 35.0-39.9)	27 (30.7%)	9 (17.6%)	
3 (BMI ≥40)	8 (9.1%)	6 (11.8%)	
Co-morbidities			
Diabetes	11 (12.5%)	6 (11.8%)	0.90
Active smoker	4 (4.5%)	4 (7.8%)	0.42
Coronary artery disease	6 (6.8%)	6 (11.8%)	0.32
Hypertension	46 (52.3%)	32 (62.7%)	0.23
Cardiac arrhythmia	4 (4.5%)	4 (7.8%)	0.42
Hyperlipidemia	25 (28.4%)	13 (25.5%)	0.71
Any pulmonary disease	27 (30.7%)	21 (41.2%)	0.23
COPD	5 (5.7%)	7 (13.7%)	0.10
Asthma	13 (14.8%)	12 (23.5%)	0.20
OSA	9 (10.2%)	8 (15.7%)	0.34
ASA class			0.21
1	1 (1.1%)	0 (0%)	
2	30 (34.1%)	15 (29.4%)	
3	50 (56.8%)	24 (47.1%)	
4	0 (0.0%)	2 (3.9%)	
Previous abdominal surgery	62 (70.5%)	44 (86.3%)	0.04
Previous PEHR	14 (15.9%)	5 (9.8%)	0.30
Preoperative work-up			
EGD	67 (76.1%)	43 (84.3%)	0.25
CT scan	40 (45.5%)	14 (27.5%)	0.04
pH study	21 (23.9%)	16 (31.4%)	0.33
UGI	53 (60.2%)	28 (54.9%)	0.54
Manometry	40 (45.5%)	23 (45.1%)	0.97
Preoperative Demeester score	23.8 (15.6)	33.4 (16.7)	0.93
Provider type			0.32
General surgeon	72 (81.8%)	45 (88.2%)	
Thoracic surgeon	16 (18.2%)	6 (11.8%)	
Surgical approach			0.56
Laparoscopic	86 (97.7%)	50 (98.0%)	
VATS	1 (1.1%)	0 (0.0%)	
Robotic	1 (1.1%)	0 (0.0%)	
Intraoperative characteristics			
Collis gastroplasty	0 (0.0%)	1 (2.0%)	0.18
Mesh	19 (21.6%)	7 (13.7%)	0.31
Fundoplication	53 (60.2%)	32 (62.7%)	0.72
Gastropexy	17 (19.3%)	10 (19.6%)	0.92
Operative time (min)	137.2 (148.2)	108.3 (51.9)	0.12

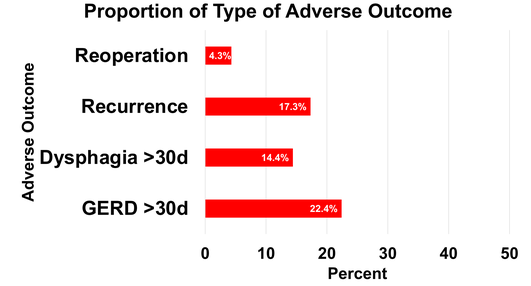


Table. Multivariable logistic regression of factors associated with a CAO.

	Odds Ratio	95% Confidence Interval	p value
Age (years)	0.97	0.941-0.995	0.02
Obesity class			
1	1.34	0.393-4.562	0.64
2	0.50	0.129-1.966	0.32
3	ref		
Previous abdominal surgery	3.10	1.146-8.358	0.03
Preoperative CT scan	0.45	0.204-0.985	0.05

Conclusions

Although the rate of having a CAO was high among obese patients, laparoscopic PEHR may be safe in a subset of patients at specialized centers.

Those with a prior history of abdominal surgery and without a preoperative CT scan were more likely to have a CAO.

These findings may help guide the appropriate selection of obese patients for laparoscopic PEHR.