Is Robotic Approach The Way To Improve Results Of Giant Paraesophageal Hernia Repair?

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Introduction

Giant paraesophageal hernia (GPEH) is a condition that continues to pose challenges in management and surgical technique. Despite advances in laparoscopic surgery, recurrence rates in GPEH remain high. GPEH is a condition primarily seen in elderly patients with multiple comorbidities, creating additional concerns for perioperatively morbidity and mortality. Until recently, laparoscopic minimally invasive GPEH repair was the standard of care; however, the da Vinci Surgical System has recently emerged as a novel way to improve upon the gold standard. The objective of this study was to evaluate clinical outcomes in a series of patients undergoing robotic GPEH repair in comparison to the present data on laparoscopic GPEH repair.

Methodology

This study was conducted via retrospective review of medical records of patients who underwent GPEH repair between November 2012 and February 2023 at a single high-volume tertiary care center. Perioperative data and patient outcomes were collected from a prospectively maintained database.

Results

Ninety-two patients underwent surgery for GPEH repair using a robotic technique. Of those patients, 67 had Type III hernias (72.8%), and 25 had Type IV hernias (27.2%). There were four conversions to open repair (4.3%), and two patients required reoperation (2.2%) for anatomic recurrence. Thirteen patients (14.1%) experienced complications, which included postoperative fever, prolonged ileus, pleural effusion, and CHF exacerbation. No perioperative mortality was noted. The mean operative time and hospital length of stay were 166.4±29.5 minutes (range 128-209 minutes) and 5.8±3.1 days (range 3-18 days), respectively. Statistical analysis indicated that obesity (BMI > 30) was significantly associated with higher rates of complications and recurrence postoperatively.

Conclusions

Robotic repair for GPEH is safe and effective, with lower rates of recurrence and symptoms postoperatively compared to laparoscopic approaches. While a randomized control trial will be needed to substantiate these results, our data support the robotic approach as the standard of care for GPEH repair.

Table 1. Patient demographics and Clinical Characteristics

Variable	Number (%)
Age (mean)	71.1±12.7
Gender	
Female	69 (75.0%)
Male	23 (25.0%)
BMI (mean)	28.4±5
Obesity (BMI>30)	30 (33.3%)
ASA	2.5±0.6
Hernia Type	
III	60 (70.6%)
IV	25 (29.4%)
Stomach herniation	
50%	10 (11.8%)
66%	5 (5.9%)
80%	15 (17.6%)
100%	55 (64.7%)
Mesh Used	87 (94.6%)
Smoking History	
Current (within 1 mo)	1 (1.2%)
Ever	23 (27.1%)
Comorbidity	
Hypertension	52 (65%)
Hyperlipidemia	44 (55%)
Diabetes Mellitus	14 (17.5%)
Coronary artery disease	11 (13.8%)
COPD	5 (6.3%)
Congestive heart failure	9 (11.3%)
Chronic kidney disease	8 (10%)

BMI – body mass index; ASA - American Society of Anaesthesiologists; COPD – chronic obstructive pulmonary disease

Table 2. Surgical characteristics and postoperative complications.

Variable	Number (%)
Operative time (min)	166.4 ± 29.5
Conversion to open	4 (4.4%)
Length of stay (days)	5.8 ± 3.1
Postoperative complications	14 (18.1%)
Clavien-Dindo Score	
I	5 (6.9%)
II	7 (9.7%)
IIIa	1 (1.4%)
IIIb	0 (0%)
IV	0 (0%)
V	0 (0%)
Postoperative dysphagia	7 (7.6%)
Postoperative regurgitation	3 (3.3%)
Anatomic recurrence	2 (2.2%)
Reoperation	2 (2.2%)
Follow-up length (months)	57.3 ± 30.8

Table 3. Robotic GPEH repair characteristics and clinical outcomes in the literature

Study	Patients, n	Study type	Conversion to open (%)	Mesh Placement (%)	Operative time, min	LOS (days)	Postoperative complications (%)	30-day mortality (%)	Anatomic recurrence (%)	Reoperation (%)	Median follow up (months)
Seetharamaiah et al.; 2013 [16]	19	R	5.3%	84.2%	184.5	4.3	10.5%	0%	0%	0%	15.6
Gerull et al.; 2020 [11]	233	P	0%	N/A	183.8	1.9	10.7%	0%	9%	1.4%	N/A
Galvani et al.; 2016 [18]	61	P	0%	100%	186	1.7	23%	0%	42%	1.6%	17
Arcerito et al.; 2019 [19]	70	R	0%	90%	223	1.6	10%	0%	8.6%	5.7%	29
Brenkman et al.; 2016 [20]	40	R	2.5%	0%	118	3	15%	2.6%	2.5%	7.5%	11
Morelli et al.; 2015 [17]	6	P	0%	33.3%	182	6	0%	0%	0%	0	12
Our Experience	94	R	4.4%	94.6%	166.4	5.8	18.1%	0%	2.2%	2.2%	57.3

R – retrospective; P – prospective; N/A – not available; LOS – length of stay