

Revisional Repair of Complex Recurrent Paraoesophageal Hernias Using a Combined Thoracic and Abdominal Robotic Approach



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INTRODUCTION

Paraesophageal hernia (PEH) recurrence following repair is frequently diagnosed radiographically in 15-35% of cases and is symptomatic in 5-15% of patients. Not only is revisional surgery required in a significant proportion of cases, but with revisional surgery comes increased morbidity and mortality risks. Several factors may be at here, including altered anatomy, shortened esophagus and dense adhesions. An open transthoracic approach has generally been recommended for revisional PEH surgery.

PURPOSE

To assess the feasibility and safety of combined thoracic and abdominal robotic approaches to revisional paraoesophageal hernia repair. A secondary aim was to identify factors that predispose patients to develop post operative complications as an exploratory study.

METHOD

This is a single center retrospective review that analyzed demographics, perioperative outcomes, complications, and symptom improvement in patients who underwent PEH recurrence revision through a combined thoracic and abdominal robotic approach by two senior surgeons over a 3.5 year period starting in July of 2021. Patient symptoms, preoperative imaging, manometry, pH-metry, esophagogastroduodenoscopy, and computed tomography scans and perioperative outcomes were reviewed. Complications were graded according to the Clavien-Dindo grading system.

RESULTS

Table 1. Cohort Characteristics (n = 17)

Variable	Value	Median (IQR)	n
Demographics			
Age (years)	56.8 ± 12.1	54 (50-67)	17
Sex - Female	13 (76.5%)		17
Sex - Male	4 (23.5%)		
BMI (kg/m ²)	28.7 ± 8.2	27.9 (23.6-32.6)	16
Current/Former Smoker	4 (25.0%)		16
Preoperative Symptoms			
GERD	14 (100%)		14
Dysphagia	10 (71.4%)		14
Nausea	5 (35.7%)		14
Regurgitation	3 (21.4%)		14
Vomiting	3 (21.4%)		14
Chest Pain	1 (7.1%)		14
Operative Details			
Gastropexy	11 (68.8%)		16
Fundoplication	4 (28.6%)		14
Operative Time (min)	335.3 ± 170.0	356 (258-419)	11
Postoperative Outcomes			
Length of Stay (days)	6.8 ± 10.1	3.0 (3.0-7.5)	15
Symptom Improvement	14 (93.3%)		15
Any Complication	6 (35.3%)		17
Clavien-Dindo Grade I	15 (93.8%)		16
Clavien-Dindo Grade II	1 (6.2%)		
30-Day Complication	1 (5.9%)		17
Follow-up (months)	16.0 ± 13.2	13.0 (6.0-24.5)	10

Figure 1. Length of Stay by Complication Status

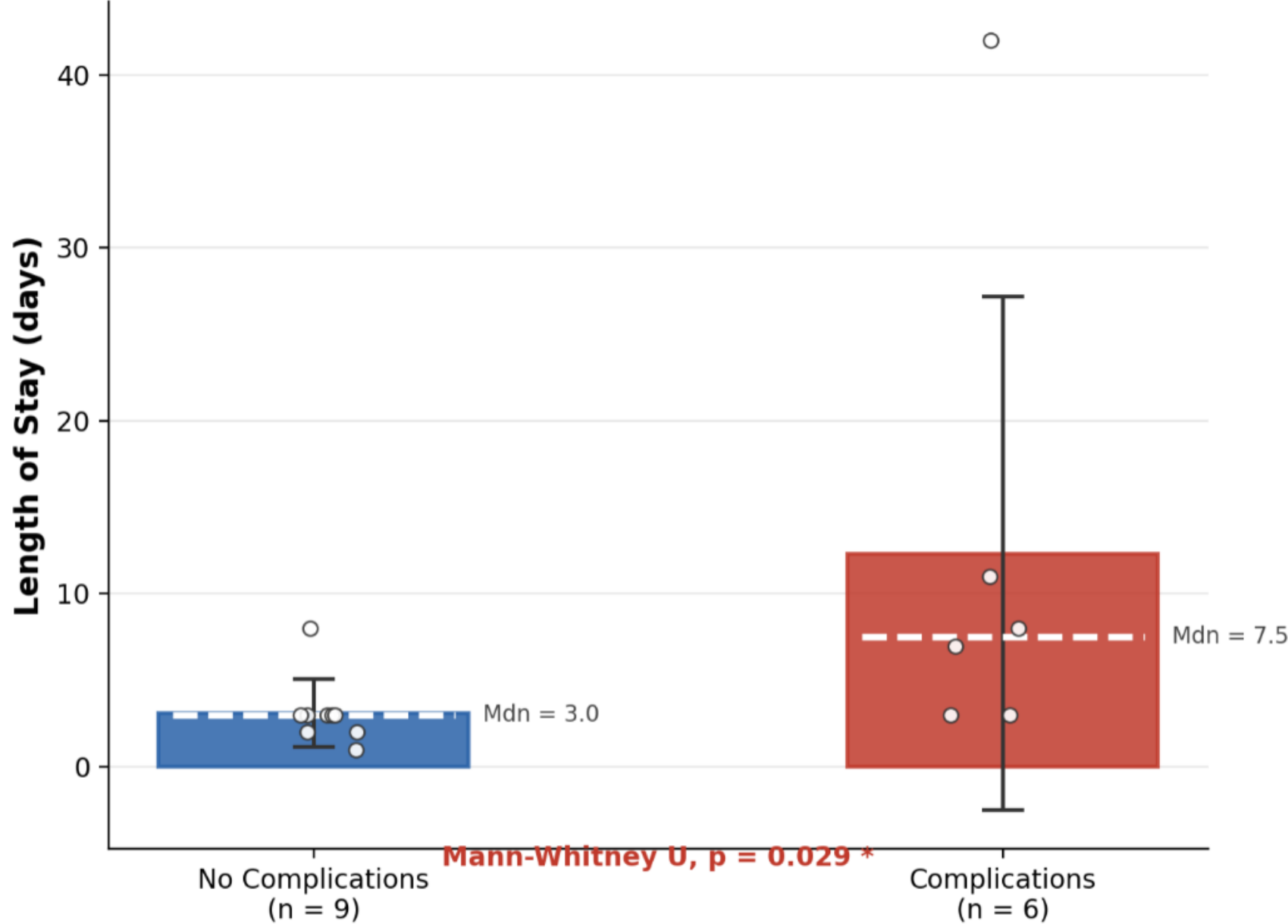
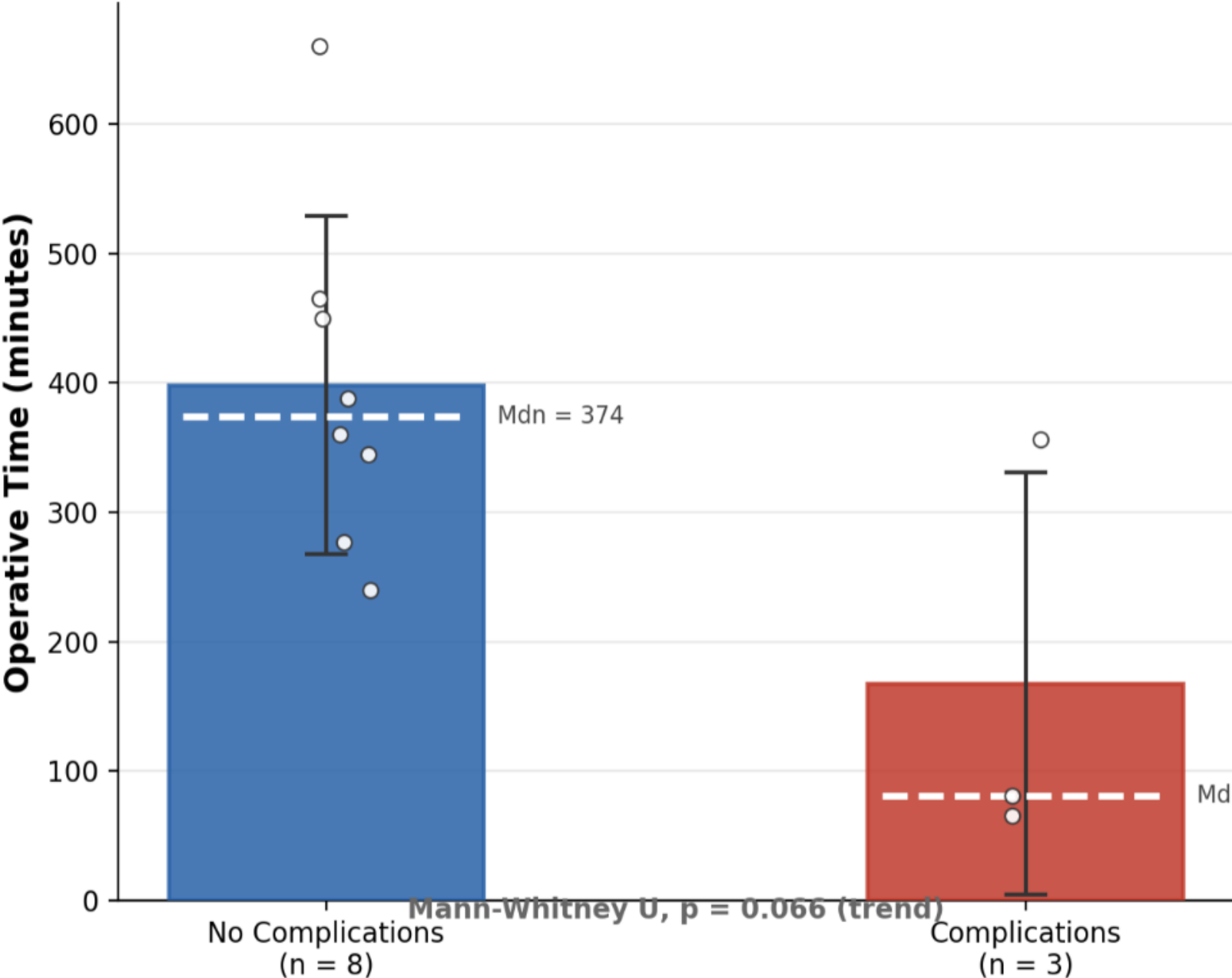


Figure 2. Operative Time by Complication Status



RESULTS

A total number of 16 patients underwent combined thoracic and abdominal robotic revisional PEH repair. The mean age was 55.9 ± 12.0 years, and 75% were female. The mean body mass index (BMI) was 28.7 ± 8.2 kg/m², consistent with an overweight-to-obese cohort. The median postoperative length of stay was 3 days (IQR 3–7.5). Mesh reinforcement was used in only one case, limiting analysis of this variable. Fifteen of 16 patients experienced symptom relief. One patient had a Clavien-Dindo grade II complication. There were no mortalities. Due to the small sample size, there were no statistically significant differences observed based on patient or operative characteristics.

CONCLUSIONS

- Postoperative complications are associated with prolonged hospitalization.** Recapitulated findings in other studies that patients who developed complications had a significantly longer length of stay (median 7.5 vs 3.0 days, p = 0.029). While the direction of causality is likely bidirectional, this underscores the importance of early complication recognition and reoperation strategies in revisional PEH cases.
- Revisional repairs achieves high rates of symptomatic relief.** Despite the inherent complexity of surgery in a previously operated field, 93.3% of patients reported postoperative symptom improvement, with 93.8% of complications classified as Clavien-Dindo Grade I (minor). The 30-day serious complication rate was only 5.9%, suggesting that revisional PEH repair remains a safe and effective intervention when performed at experienced centers.
- No single preoperative factor emerged as a clear predictor of adverse outcomes.** Age, BMI, sex, smoking status, number of prior redo procedures, time interval between surgeries, and preoperative symptom profile did not significantly predict complications or recurrence, though this was likely a result of a small sample. These null findings likely reflect insufficient statistical power, and warrants investigation in larger cohorts. This study has several important limitations. First, the sample size of 17 patients is severely underpowered to detect small-to-moderate effect sizes, with statistical power for medium effects (Cohen's d = 0.5) estimated at only 15–20%, meaning clinically meaningful associations are likely missed. Second, the retrospective single-center design limits generalizability and introduces the possibility of unmeasured confounders, inconsistent documentation, and referral bias. Finally, this study is explicitly hypothesis-generating; all associations identified require prospective validation in a larger, preferably multi-institutional cohort before any clinical recommendations can be drawn.

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