

Comparison of Surgical Outcomes Between Laparoscopic and Robotic Hartmann’s Reversal: A Retrospective Series of 41 Cases

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Background

- Hartmann’s reversal (HR), defined as closure of the colostomy with restoration of bowel continuity, is considered a challenging procedure because of dense intra-abdominal adhesions.
- Minimally invasive HR, particularly over the last decade, has become increasingly popular due to higher success rates and lower morbidity.
- Studies have shown safety and efficacy with better visualization and dissection for the robotic approach.¹
- The objective of this study was to determine if there are significant differences in outcomes between the robotic and laparoscopic approach.

Methods

- A retrospective chart review included 41 patients who underwent laparoscopic (n=20) or robotic (n=21) HR, by four colorectal surgeons from January 2020 to August 2025.
- Surgical approach depended on robotic platform availability (da Vinci® Xi) and surgeon preference.
- All patients received pre-operative bowel preparation and prophylactic antibiotics.
- All statistical analyses were conducted using Stata/SE 18 (StataCorp).

Results

Table 1. Patient demographics.

Demographic	Laparoscopic HR <i>n</i> =20	Robotic HR <i>n</i> =21	<i>p</i> -value
Age –	67.9 (12.2)	59.4 (14.2)	0.04 †
Sex (male)µ	11	12	0.89
BMI –	28.1 (4.5)	28.5 (5.7)	0.77
ASA –	2.45 (0.51)	2.29 (0.46)	0.29
Charlson Comorbidity Index €	3.15 (1.73)	2.24 (1.09)	0.05

µ Frequency (n), analyzed with Chi2
– Mean (SD), analyzed with Student’s t-test
€ Mean (SD), analyzed with Welch’s t-test
† Statistically significant p (< 0.05)

Table 2. Approach and Indication for Hartmann’s Procedure

Hartmann’s Procedure characteristics	Laparoscopic HR <i>n</i> =20	Robotic HR <i>n</i> =21	<i>p</i> -value
Hartmann procedure *			0.99
Open	15	15	
Laparoscopic	5	5	
Robotic	0	1	
Indication for HP *			0.07
Acute diverticular disease	9	15	
Malignant obstruction	7	3	
Other ∞	4	3	

* Frequency (n), analyzed with Fisher’s exact test
∞ Anastomotic leak, colonic intussusception, stercoral perforation, sigmoid volvulus.

Limitations

- The limited sample size in both groups reduces the statistical power of the results.
- Randomization between procedures was not feasible due to the study design.

Table 3. Peri-operative and surgery data.

Peri-operative and surgery data	Laparoscopic HR <i>n</i> =20	Robotic HR <i>n</i> =21	<i>p</i> -value
Conversion *	5	0	0.021 †
Days to reversal ◦	282 (188-617)	157 (120-265)	0.002 †
Operative time (min) –	174.6 (65.1)	179.9 (58.6)	0.787
EBL (mL) ◦	20 (20-100)	20 (10-50)	0.204
Splenic mobilization µ	11	5	0.041 †
Intraoperative bowel event			
Enterotomy + enterectomy	2	1	
Enterotomy + enterorrhaphy	0	1	
Protective ileostomy *	4	1	0.184

* Frequency (n), analyzed with Fisher’s exact test µ Frequency (n), analyzed with Chi2 – Mean (SD), analyzed with Student’s t-test
◦ Median (IQR), analyzed with Mann–Whitney U test † Statistically significant p (< 0.05)

Table 4. Postoperative surgical outcomes.

Postoperative surgical outcomes	Laparoscopic HR <i>n</i> =20	Robotic HR <i>n</i> =21	<i>p</i> -value
Days until discharge ◦	3 (2-5)	3 (2-4)	0.768
OR readmission *	0	1	0.99
Postoperative complications *			0.99
Ileus	2	2	
Abscess	1	0	
Acute Kidney Injury	0	1	
30-day mortality	0	0	

* Frequency (n), analyzed with Fisher’s exact test
◦ Median (IQR), analyzed with Mann–Whitney U test

Conclusions

- Both approaches are safe and with low morbidity.
- Laparoscopic HR had higher conversion rates compared to robotic HR.

References

1.Giuliani G, Formisano G, Milone M, Salaj A, Salvischiani L, Bianchi PP. Full robotic Hartmann's reversal: technical aspects and preliminary experience. Colorectal Dis. 2020 Nov;22(11):1734-1740.

2. Infante M, Kulangara R, Lujan HJ. Anvil Through the Stoma and Out the Side Technique for Robotic Hartmann’s Reversal: Case series. Presented at: SAGES Meeting; March 2026; Tampa, FL.