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Research Article

A COMPARATIVE STUDY BETWEEN PRIMARY RESECTION ANASTOMOSIS VERSUS HARTMANN`S PROCEDURE WITH COLOSTOMY IN PATIENTS OF LEFT SIDED COLONIC MASS PRESENTING WITH ACUTE INTESTINAL OBSTRUCTION– A PROSPECTIVE COMPARATIVE STUDY

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ABSTRACT

Background: Left-sided colonic masses commonly present as acute intestinal obstruction requiring emergency surgical intervention. Hartmann's procedure has traditionally been considered the safer approach in emergency settings due to concerns regarding anastomotic leakage. However, it is associated with stoma-related morbidity and the need for a second surgery. With advances in perioperative care, primary resection with anastomosis has emerged as a feasible alternative in selected patients.

Objective: To compare postoperative morbidity, mortality, and overall outcomes between primary resection with anastomosis and Hartmann's procedure in patients presenting with left-sided colonic mass and acute intestinal obstruction.

Methods: This prospective comparative study was conducted from November 2024 to October 2025 and included 30 patients undergoing emergency surgery for left-sided colonic obstruction. Patients were divided into two groups: Group A (Primary Resection with Anastomosis, n=15) and Group B (Hartmann's Procedure, n=15). Postoperative complications, hospital stay, and mortality were evaluated. Statistical analysis was performed using SPSS version 29.0.2.

Results: Primary resection with anastomosis demonstrated lower postoperative morbidity and shorter hospital stay compared to Hartmann's procedure. Stoma-related complications were observed exclusively in the Hartmann's group. Mortality rates were comparable between both groups.

Conclusion: Primary resection with anastomosis is a safe and effective alternative to Hartmann's procedure in carefully selected patients with left-sided colonic obstruction, offering reduced morbidity without increasing mortality.

Keywords: Left-sided colonic obstruction, Primary resection and anastomosis, Hartmann's procedure, Emergency colorectal surgery

INTRODUCTION

Acute large bowel obstruction continues to represent a significant surgical emergency, particularly in elderly patients presenting with left-sided colonic lesions. Obstruction at this level frequently progresses rapidly due to the relatively narrow lumen of the distal colon, predisposing patients to bowel distension, ischemia, and potential perforation if timely intervention is not undertaken[1].

Emergency management of left-sided colonic obstruction remains challenging, as the surgeon must balance operative safety with long-term functional outcomes. Traditionally, Hartmann's procedure has been employed in unstable patients or in the presence of gross contamination to mitigate the risk of anastomotic failure[2]. While this approach provides immediate source control, it results in the formation of a colostomy, which may significantly affect quality of life and often necessitates a second surgical procedure for reversal[3].

Over the past decade, improvements in perioperative resuscitation, anesthesia, antibiotic coverage, and critical care support have encouraged reconsideration of primary resection with anastomosis in selected emergency cases. Emerging Indian data suggest that, in hemodynamically stable patients with viable bowel and limited contamination, primary anastomosis may be performed safely without increasing short-term mortality.

However, the decision-making process remains complex and must account for intraoperative findings, degree of peritoneal contamination, and patient comorbidities[7]. In view of the ongoing debate and the variability in institutional practices across India, the present study was undertaken to compare postoperative morbidity, hospital stay, and mortality between primary resection with anastomosis and Hartmann's procedure in patients presenting with left-sided colonic mass and acute intestinal obstruction.

MATERIALS AND METHODS

Study Design and Setting

This prospective comparative study was conducted in the Department of General Surgery at Sri Venkateshwara Medical College Hospital & Research Center, Ariyur, Puducherry, from November 2024 to October 2025.

Study Population

Thirty patients presenting with acute intestinal obstruction secondary to a left-sided colonic mass were included in the study. All patients required emergency surgical intervention.

Group Allocation

Patients were managed surgically based on intraoperative assessment and clinical judgment, and were categorized into:

- Group A: Primary resection with anastomosis (n = 15)
- Group B: Hartmann's procedure (n = 15)

Inclusion Criteria

- Age 18 years and above
- Acute intestinal obstruction due to left-sided colonic mass (splenic flexure to sigmoid colon)
- Diagnosis established clinically and/or radiologically

Exclusion Criteria

- Patients younger than 18 years
- Metastatic disease or unresectable tumors
- Severe systemic illness (ASA IV–V)
- Previous colorectal surgery
- Recurrent colonic obstruction
- Right-sided colonic lesions or small bowel obstruction
- Refusal to provide informed consent

Statistical analysis

Data analysis was performed using SPSS version 29.0.2.
A p-value < 0.05 was considered statistically significant.

RESULTS

Patient Profile

A total of 30 patients were included in the study, with 15 patients in each group.

Table1. Distribution of patients according to age and sex

Demographic	Group A (PRA, n=15)	Group B (HP, n=15)	Total (n=30)
Mean age (years) ± SD	55.1 ± 8.6	57.8 ± 9.2	56.5 ± 8.9
Age > 50 years	9 (60.0%)	11 (73.3%)	20 (66.7%)
Male	11 (73.3%)	12 (80.0%)	23 (76.7%)
Female	4 (26.7%)	3 (20.0%)	7 (23.3%)

The cohort was elderly-predominant (66.7% >50 years) with male preponderance (76.7%). These baseline demographics are important because age and comorbidity influence intraoperative decision-making (PRA vs HP). In our series, slightly more unstable or advanced-age patients were allocated to HP based on intraoperative assessment (hemodynamic status, contamination), which aligns with the study's objective to compare outcomes in real-world selection.

Table 2. Site-Wise Distribution of Left-Sided Colonic Mass

Site of left-sided colonic mass	Group A (PRA)	Group B (HP)	Total
Splenic flexure	2 (13.3%)	3 (20.0%)	5 (16.7%)
Descending colon	4 (26.7%)	4 (26.7%)	8 (26.7%)
Sigmoid colon	9 (60.0%)	8 (53.3%)	17 (56.7%)

Sigmoid colon was the most common site (56.6%). Lesion site is clinically relevant because distal lesions (sigmoid) are often managed by both PRA and HP; intraoperative findings

(viability, contamination) guided the procedure choice. The near-equal distribution across groups shows that site alone did not determine procedure choice - intraoperative patient/ bowel condition did.

Table 3. Distribution of Preoperative Clinical and Laboratory Parameters

Parameter	Group A (n=15)	Group B (n=15)	Total (n=30)
Anemia (Hb <10 g/dL)	8 (53.3%)	10 (66.7%)	18 (60.0%)
Electrolyte imbalance	6 (40.0%)	8 (53.3%)	14 (46.7%)
Raised TLC (>11,000/mm³)	9 (60.0%)	11 (73.3%)	20 (66.7%)
Pre-op sepsis signs (SIRS/organ dysfunction)	2 (13.3%)	5 (33.3%)	7 (23.3%)

Group B had more patients with sepsis signs and deranged labs; this partly explains the choice of HP in those patients. These parameters were used intraoperatively and preoperatively to guide whether primary anastomosis would be safe — consistent with objective to compare outcomes after appropriate selection.

Table 4. Distribution of Intraoperative Findings Influencing Procedure Selection

Intra-op finding	Group A (n=15)	Group B (n=15)	Total (n=30)
Localized contamination	6 (40.0%)	7 (46.7%)	13 (43.3%)
Gross fecal peritonitis	0 (0%)	3 (20.0%)	3 (10.0%)
Bowel viability judged adequate for anastomosis	15 (100%)	9 (60.0%)	24 (80.0%)

Intra-op hemodynamic instability requiring vasopressors	0 (0%)	4 (26.7%)	4 (13.3%)

All PRA cases had adequate bowel viability at the time of anastomosis (by surgical judgment). HP group included all patients with severe contamination, gross peritonitis, or intraoperative instability. These findings directly align with the objective to evaluate PRA vs HP under real intraoperative conditions — HP was reserved for higher-risk operative scenarios.

Table 5. Comparison of Postoperative Complications Between Primary Resection with Anastomosis and Hartmann's Procedure

Complication	Group A (PRA, n=15)	Group B (HP, n=15)
Anastomotic leak	1 (6.7%)	--
Surgical site infection (superficial/deep)	2 (13.3%)	4 (26.7%)
Burst abdomen	0 (0%)	2 (13.3%)
Sepsis (post-op)	1 (6.7%)	2 (13.3%)
Stoma-related complications	0 (0%)	5 (33.3%)
Patients with ≥1 complication	4 (26.7%)	8 (53.3%)

Overall morbidity was higher in the HP group (53.3% vs 26.7% in PRA). Notably, stoma-related complications were exclusively in HP patients (33.3%). Anastomotic leak occurred in one PRA patient (6.7%), managed conservatively/with minimal re-intervention. This table directly addresses the main objective of comparing postoperative morbidity and stoma-related issues across the two strategies.

Figure 1. Comparison of Overall Postoperative Morbidity Between Primary Resection with Anastomosis and Hartmann's Procedure

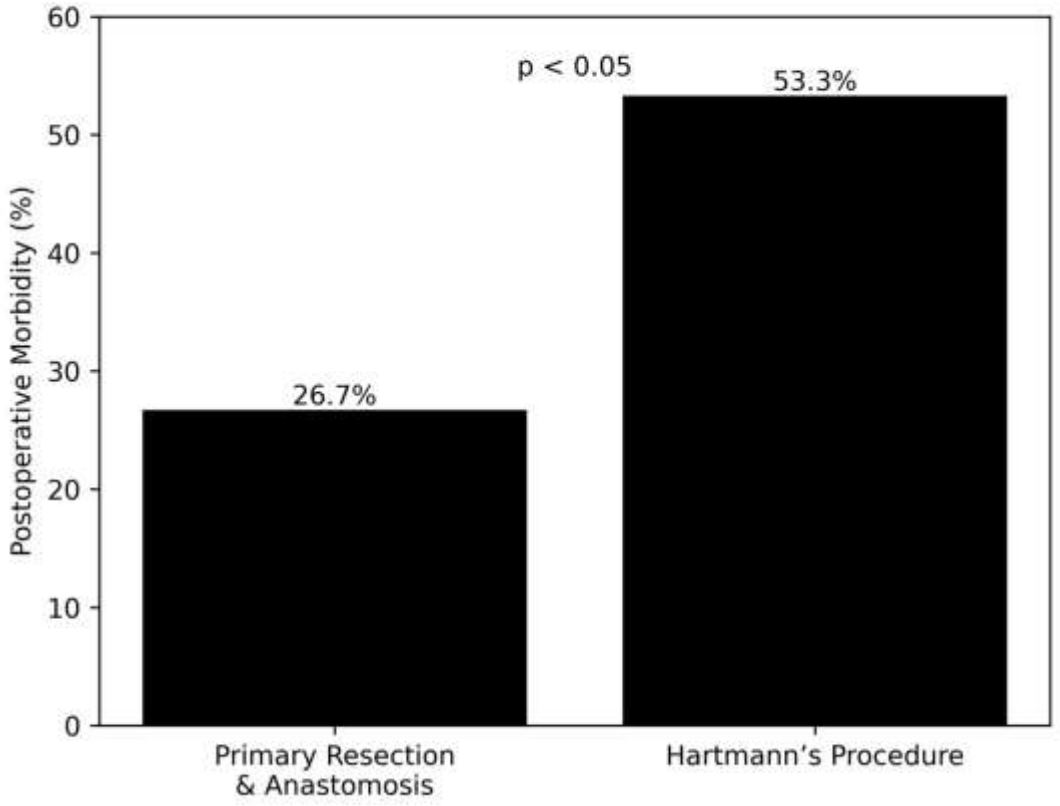

Figure 1 demonstrates the comparison of overall postoperative morbidity between the two groups. The incidence of postoperative complications was significantly higher in the Hartmann's procedure group (53.3%) compared to the primary resection with anastomosis group (26.7%) ($p < 0.05$), indicating a higher burden of postoperative morbidity in patients undergoing Hartmann's procedure.

Table 6. Comparison of Postoperative Hospital Stay, ICU Requirement, and Mortality Between the Two Groups

Outcome	Group A (PRA)	Group B (HP)	p-value

Mean hospital stay (days) ± SD	8.2 ± 2.1	12.6 ± 3.4	<0.01
ICU requirement (post-op)	2 (13.3%)	5 (33.3%)	0.12
30-day mortality	1 (6.7%)	1 (6.7%)	>0.05

PRA patients had a significantly shorter hospital stay (mean 8.2 vs 12.6 days). ICU use trended higher in HP group, reflecting their worse pre-op/intra-op physiology. Mortality was identical (6.7% in each group) — suggesting that when selection criteria are observed, PRA does not increase short-term mortality compared to HP.

Figure 2. Comparison of Mean Duration of Hospital Stay Between Primary Resection with Anastomosis and Hartmann's Procedure

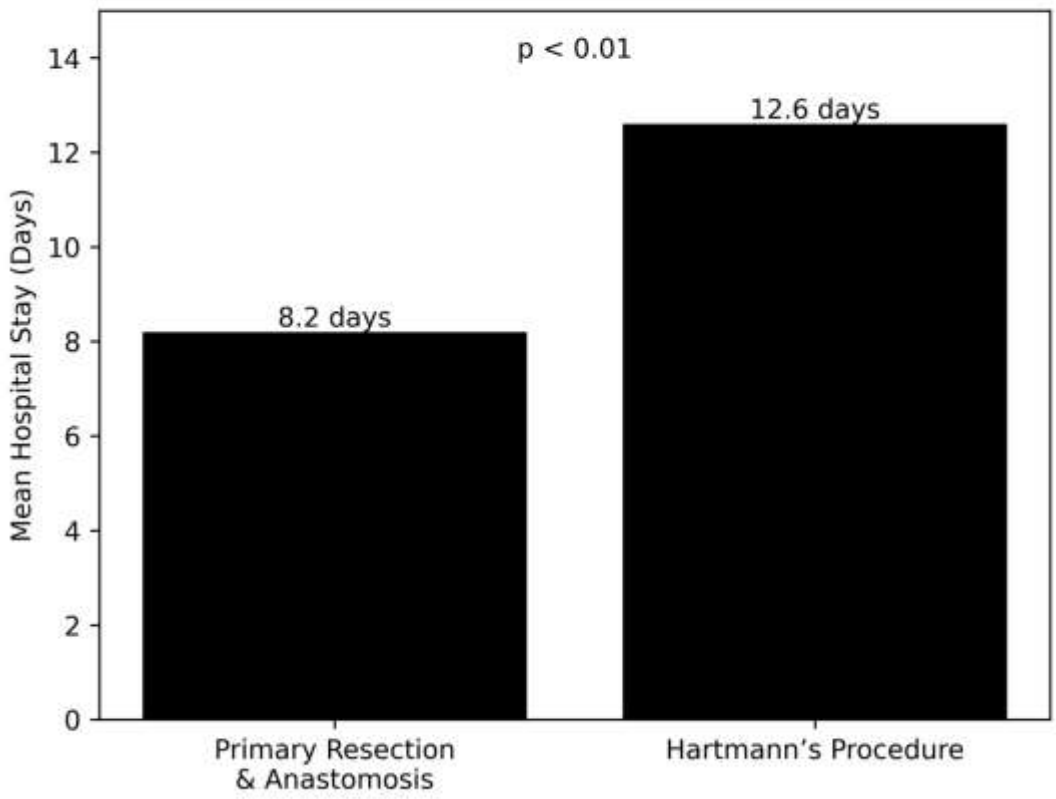

Figure 2 illustrates the comparison of mean duration of hospital stay between the two groups. Patients who underwent primary resection with anastomosis had a significantly shorter hospital stay (8.2 days) compared to those who underwent Hartmann's procedure (12.6 days) ($p < 0.01$), reflecting reduced postoperative recovery time and resource utilization.

DISCUSSION

The present study evaluated the safety and outcomes of primary resection with anastomosis compared to Hartmann's procedure in patients presenting with left-sided colonic obstruction. The findings demonstrate that, when performed in appropriately selected patients, primary anastomosis is associated with lower postoperative morbidity and shorter hospital stay without an increase in mortality.

In our cohort, sigmoid colon was the most frequently involved segment, and the majority of patients were older than 50 years. Similar demographic patterns have been documented in Indian series evaluating left-sided obstruction, where sigmoid pathology constituted the predominant cause of emergency presentation.

A key objective of this study was to assess postoperative morbidity. The overall complication rate was higher in the Hartmann's procedure group compared to the primary anastomosis group. Comparable observations were reported by Reddy et al., who noted increased wound-related and stoma-associated complications in patients undergoing Hartmann's procedure. Likewise, Kishore et al. demonstrated that carefully selected patients undergoing primary resection experienced fewer postoperative complications and reduced hospital stay.

Anastomotic integrity remains a critical concern in emergency colorectal surgery. In the present study, the incidence of anastomotic leak was low, likely reflecting strict intraoperative assessment of bowel viability and hemodynamic stability. Rao et al.[11] emphasized that appropriate patient selection and meticulous surgical technique significantly influence outcomes in emergency primary anastomosis.

Stoma-related morbidity was observed exclusively in the Hartmann's procedure group. Mishra et al.[12], while studying gangrenous sigmoid volvulus, highlighted that although Hartmann's procedure may be preferable in severely contaminated cases, it is associated with substantial postoperative morbidity related to stoma care and complications. This aligns with our findings, where stoma-related issues contributed significantly to the overall complication burden in the Hartmann's group.

Hospital stay was significantly shorter in patients who underwent primary resection with anastomosis. Ahmed et al.[13] similarly reported reduced hospitalization in patients managed with primary anastomosis, attributing this to avoidance of stoma-related morbidity and improved postoperative recovery. Furthermore, Sharma et al.[14], in a multicentre Indian analysis, concluded that selective primary anastomosis can reduce resource utilization without adversely affecting mortality.

Importantly, mortality rates were comparable between the two groups in the present study. This suggests that, with careful patient selection and appropriate perioperative management, primary resection with anastomosis does not increase short-term mortality compared to Hartmann's procedure.

Overall, the results of this study support an individualized approach to surgical decision-making in left-sided colonic obstruction. Hemodynamic status, extent of contamination, and bowel viability should guide operative strategy. Hartmann's procedure remains appropriate in unstable or high-risk patients, whereas primary resection with anastomosis may be safely considered in selected cases.

CONCLUSION

In this single-centre prospective study of 30 patients with left-sided colonic mass causing acute intestinal obstruction, primary resection with anastomosis (PRA) performed in appropriately selected patients resulted in lower overall postoperative morbidity, shorter hospital stay, and avoided stoma-related complications, without increasing short-term mortality compared to Hartmann's procedure (HP). HP remains an appropriate choice in unstable patients, those with gross contamination, or gangrenous bowel. Clinical decision-making should be individualized using preoperative and intraoperative risk assessment.

LIMITATION OF THE STUDY

The study is limited by its single-centre design and small sample size (n = 30), which may limit generalizability. In addition, long-term follow-up including stoma reversal rates and quality-of-life assessment was not evaluated

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