

Evaluation of the Clinical Outcomes of Colostomy and Subtotal Colectomy in Patients with Paralytic Ileus Associated with Prolonged Hospitalization

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Abstract

Aim: Paralytic ileus secondary to prolonged hospitalization may require surgery in patients unresponsive to conservative management. Colostomy allows rapid decompression, whereas subtotal colectomy offers a more definitive solution; however, comparative evidence remains limited.

Methods: We conducted a single-center retrospective study of 13 patients aged ≥ 65 years hospitalized for ≥ 14 days with paralytic ileus or distension refractory to conservative therapy. Four patients underwent sigmoidostomy, and nine underwent subtotal colectomy. Primary endpoints included mortality and major morbidity, while secondary endpoints encompassed ICU and total hospital stay, time to enteral feeding, need for reoperation, and quality of life.

Results: Sigmoidostomy was associated with shorter operative time (65 vs. 160 min, $p < 0.001$), ICU stay (3 vs. 6 days, $p = 0.01$), total hospital stay (10 vs. 18 days, $p = 0.01$), and earlier enteral feeding (1 vs. 4 days, $p = 0.002$). No mortality or major complications occurred in the sigmoidostomy group; subtotal colectomy had a mortality rate of 11.1% and a major complication rate of 22.2%. At six months, recurrent ileus was absent after subtotal colectomy, but mild distension recurred in the colostomy group. Quality-of-life scores were higher in the subtotal colectomy group, suggesting superior functional recovery.

Conclusions: Colostomy enables faster early recovery, while subtotal colectomy may reduce recurrence and improve mid-term functional outcomes in carefully selected patients. Surgical decision-making should account for frailty, nutritional and infection status, and therapeutic goals. Prospective multicenter studies are required to validate these findings.

Keywords: Geriatric surgery; paralytic ileus; acute colonic pseudo-obstruction (ogilvie's syndrome); colostomy; subtotal colectomy.

1. Introduction

Paralytic ileus is a severe clinical condition characterized by a marked reduction or complete cessation of intestinal motility due to neuromuscular dysfunction in the absence of mechanical obstruction.¹ Although the onset is often insidious, it can progress rapidly to a critical state in patients with prolonged hospitalization. Major contributing factors include sepsis and systemic inflammation, electrolyte imbalances, use of opioids and anticholinergic drugs, major surgeries, and prolonged immobilization.^{2,3,4} These factors disrupt intestinal smooth muscle contractility, inhibit peristalsis, and halt intraluminal passage, leading to bowel distension, increased intraluminal pressure, and heightened risk of tissue ischemia. This cascade can result in severe complications such as aspiration, malnutrition, pressure ulcers, catheter-related infections, prolonged hospitalization, and elevated healthcare costs.³

In postoperative and critically ill patients, the definition and as-

essment of paralytic ileus remain heterogeneous. Various clinical scores and radiologic criteria have been proposed, but the lack of standardization limits the comparability of treatment protocols and the interpretation of outcomes. Recent systematic reviews and consensus statements emphasize the need for unified diagnostic criteria and standardized data collection methods, particularly in postoperative and critically ill populations.^{1,5,6}

First-line management focuses on conservative measures after exclusion of mechanical obstruction, including nasogastric decompression, fluid and electrolyte optimization, early mobilization, opioid minimization or rotation, and administration of prokinetic or cholinergic agents in selected cases.^{2,7} Additionally, in patients presenting with acute colonic pseudo-obstruction (Ogilvie's syndrome), pharmacologic (e.g., neostigmine) and endoscopic decompression strategies have demonstrated efficacy and safety.^{8,9,10}

Nevertheless, these approaches may fail, necessitating surgical intervention in patients with recurrent or refractory distension or ileus, or those at high risk of complications.^{10,11}

Among surgical options, colostomy and subtotal colectomy are most prominent. Colostomy provides rapid decompression with lower procedural stress but does not permanently correct global motility disorders and may entail stoma-related complications and long-term care.^{12,13} Subtotal colectomy offers definitive decompression and restoration of intestinal transit in cases of significant colonic dilation or recurrent distension, but carries a higher surgical risk, including anastomotic leakage and postoperative complications.¹¹

Despite available evidence, comparative data on colostomy versus subtotal colectomy in patients with paralytic ileus secondary to prolonged hospitalization remain limited, especially regarding mortality, major morbidity, ICU and total hospital stay, time to enteral feeding, need for reoperation, and quality of life.^{1-3,5-7,10,11,14,15} This knowledge gap impairs individualized surgical decision-making.

This study aimed to evaluate clinical outcomes of colostomy versus subtotal colectomy in patients with paralytic ileus associated with prolonged hospitalization. We hypothesized that colostomy allows rapid decompression, lower procedural morbidity, and easier postoperative management, whereas subtotal colectomy may reduce recurrence, minimize reintervention, and improve mid-term functional outcomes.

2. Materials and Methods

This retrospective, single-center study was approved by the Ethics Committee for Non-Interventional Clinical Research of Van Yüzüncü Yıl University (Decision No: 2025/04-16, Date: 25/04/2025) and conducted in accordance with the Declaration of Helsinki. Patient data were analyzed anonymously.

Patients aged ≥ 65 years hospitalized between 2022 and 2024 were evaluated. Inclusion criteria were ICU or general surgery admission for ≥ 14 days with signs of paralytic ileus despite conservative therapy. Exclusion criteria included mechanical obstruction, intestinal perforation, malignancy, severe comorbidities, poor general condition precluding surgery, or incomplete records.

Surgical interventions included either colostomy or subtotal colectomy. In colostomy, the stoma site was optimized, the colon transected, and rapid decompression was achieved with minimal tissue trauma. In subtotal colectomy, the colon was mobilized, resected, and an anastomosis created with assessment of vascular perfusion and integrity. Postoperative care included stoma management, drain placement, and complication monitoring.

Demographics, comorbidities, surgical history, hospitalization duration, ileus length, ICU requirement, and postoperative complications were recorded. Primary endpoints were mortality and major morbidity (anastomotic leakage, intra-abdominal infection, or sepsis). Secondary endpoints included time to enteral feeding, reoperation, stoma-related complications, and quality of life.

2.1. Statistical Analysis

All data were analyzed using SPSS version 29.0 (IBM Corp., Armonk, NY, USA). Continuous variables were first assessed for normality using the Shapiro-Wilk test. Normally distributed variables were presented as mean \pm standard deviation and compared using the independent-samples t-test, whereas non-normally distributed variables were expressed as median with interquartile range (IQR) and analyzed using the Mann-Whitney U test. Categorical variables were presented as counts and percentages and compared using the chi-square test or Fisher's exact test where appropriate. All statistical tests were two-tailed, and a p-value of less than 0.05 was considered statistically significant. This approach ensured

appropriate handling of both parametric and non-parametric data in accordance with best practices and the recommendations of the reviewing referee.

3. Results

The study included 13 patients: 4 underwent sigmoidostomy, and 9 subtotal colectomy. Median age was 73 years (65–84); 8 males (61.5%) and 5 females (38.5%). The most common comorbidities were hypertension (54%), diabetes (38%), and chronic kidney disease (15%).

Operative time differed significantly: 65 min (IQR 60–75) in sigmoidostomy vs. 160 min (IQR 145–180) in subtotal colectomy. Shorter operative time reflects lower procedural stress with colostomy, whereas subtotal colectomy was more complex (Table 1).

Table 1

Surgical Operation Duration and Type

Surgical Method	Number of Patients	Operation Time (min, median IQR)	Open/Lap (Laparoscopic)
Sigmoidostomy	4	65 (60–75)	3 Open / 1 Laparoscopic
Subtotal Colectomy	9	160 (145–180)	9 Open

Table 2

ICU Stay, Hospital Length of Stay, and Time to Initiation of Enteral Feeding

Surgical Method	ICU Stay (days)	Hospital Stay (days)	Time to Start Enteral Feeding (days)
Sigmoidostomy	3 (2–4)	10 (9–12)	1 (1–2)
Subtotal Colectomy	6 (4–8)	18 (15–22)	4 (3–5)

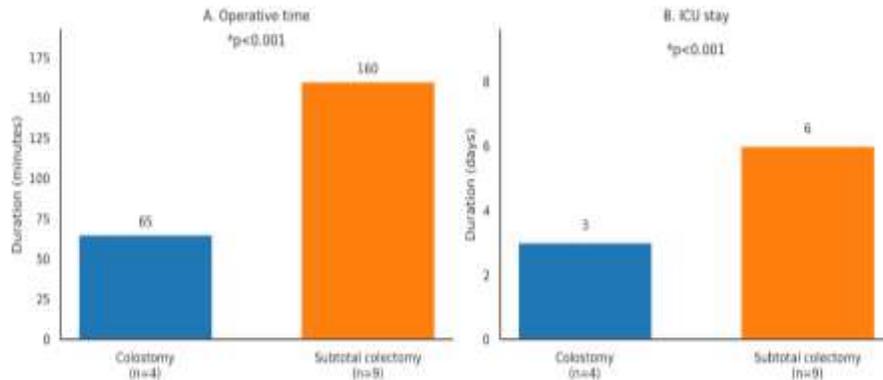
Table 3

Mortality and Major Complications

Parameter	Sigmoidostomy (n=4)	Subtotal Colectomy (n=9)
Mortality	0	1 (%11,1)
Major Morbidity	0	2 (%22,2)
Stoma-related Complications	1 (%25)	-

Figure 1

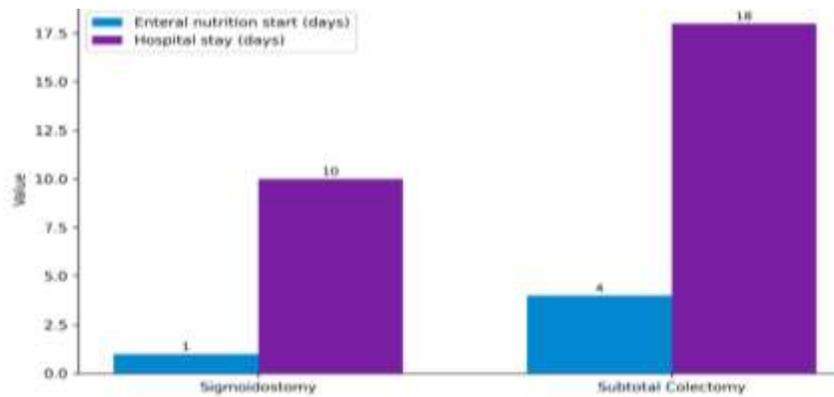
Comparison of operative time (minutes) and intensive care unit (ICU) stay (days) between colostomy (n=4) and subtotal colectomy (n=9) groups.



Data are presented as group values consistent with reported medians; significance annotated as reported (Mann-Whitney U test, $p < 0.001$).

Figure 2

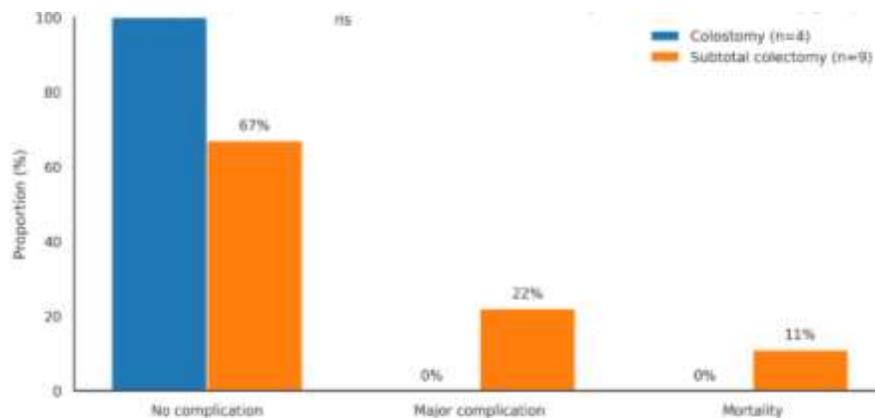
Time to initiation of enteral feeding and length of hospital stay after colostomy and subtotal colectomy.



Median (IQR) values are shown for enteral feeding; Mann-Whitney U test $p = 0.002$.

Figure 3

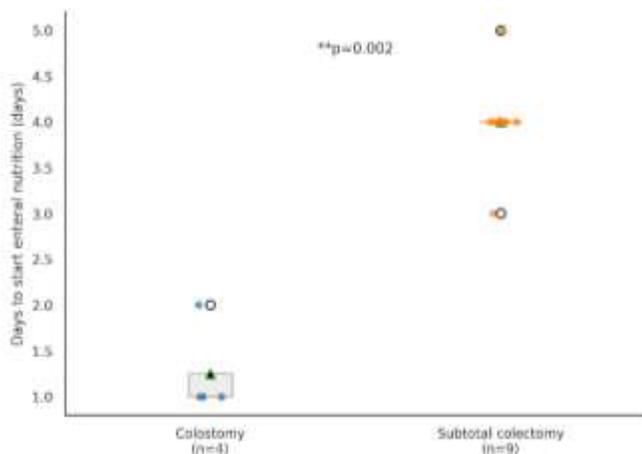
Distribution of postoperative complications between colostomy (n=4) and subtotal colectomy (n=9) groups (Total n=13).



Percentages are shown per group. No statistically significant differences were observed (ns).

Figure 4

Days to start enteral nutrition by surgical method.



Box shows median and IQR; mean shown as a triangle. Mann-Whitney U test: $p=0.002$.

Table 4

Reoperation and Long-Term Function

Surgical Method	Reoperation	Ileus Recurrence	Quality of Life (SF-36)
Sigmoidostomy	0	Mild in 2 patients	Moderate
Subtotal Colectomy	1 (%11,1)	0	High

ICU and total hospital stay were longer in subtotal colectomy: median ICU 6 days vs. 3 days, total hospitalization 18 vs. 10 days. Time to enteral feeding was earlier with sigmoidostomy (Table 2, Figure 1,2), (median 1 vs. 4 days, $p=0.002$).

Mortality and major complications occurred only in subtotal colectomy: 1 death (11.1%) and 2 major complications (22.2%). Sigmoidostomy had minor stoma-related skin irritation in 1 patient (25%), (Table 3, Figure 3).

Long-term outcomes: subtotal colectomy had no recurrent ileus, higher SF-36 quality-of-life scores; sigmoidostomy had mild recurrent distension in 2 patients (Table 4).

In summary, sigmoidostomy offers shorter operative time, earlier feeding, and reduced hospitalization, while subtotal colectomy reduces recurrence and improves functional outcomes (Figure 4). Surgical approach should be individualized considering patient's condition, goals, and risks.

4. Discussion

Within the spectrum of paralytic ileus and acute colonic pseudo-obstruction (ACPO), surgical decision-making in elderly and frail patients with prolonged hospitalization requires careful consideration of multiple factors, including neuroimmune dysfunction, medication burden, sepsis or systemic inflammation, electrolyte imbalances, and overall frailty.⁴ Boeckstaens and De Jonge emphasized the pivotal role of enteric nervous system-immune system interactions in ileus pathogenesis⁴, while Reintam Blaser et al. and the

ESICM working group highlighted that variability in terminology and outcome measures limits comparability in research.^{3,6} In our cohort, patients undergoing surgery represented a refractory phenotype with prolonged hospitalization and multiple risk factors, which aligns with Harrison et al.'s concept of dynamically determining a "surgical threshold" based on patient condition and recurrence patterns.^{16,17}

Regarding short-term outcomes, colostomy was associated with shorter operative time, reduced ICU and total hospital stay, and earlier resumption of enteral feeding.^{1,2} These findings reflect the practical benefits of a lower physiological burden approach in hemodynamically fragile patients. The early feeding observed in our colostomy group was applied through approaches partially parallel to ERAS principles, rather than a strict ERAS protocol.¹⁸ In contrast, subtotal colectomy required longer operative duration and delayed enteral feeding to ensure anastomotic safety, reflecting the more invasive nature of the procedure.^{11,14}

Major complications occurred only in the subtotal colectomy group, including one case of anastomotic leakage.^{11,14} This does not conflict with our exclusion criteria, as patients with a history of prior postoperative leakage were excluded, and the observed complication occurred postoperatively in the current study. Reoperation was required in one patient due to anastomotic leakage, highlighting the need for careful patient selection and postoperative monitoring.¹¹

The decision to perform colostomy versus subtotal colectomy was based on objective clinical and radiological criteria, including patient comorbidities, signs of sepsis, clinical deterioration, peritoneal irritation, and colon diameter measured on imaging.^{8,9,10} Patients with uncontrolled sepsis or higher frailty scores were preferentially directed to colostomy, whereas subtotal colectomy was reserved for patients with recurrent distension, significant colonic dilatation, or refractory symptoms after conservative measures.^{11,14} Selection bias should be acknowledged, as patients undergoing subtotal colectomy likely represented a more severe baseline phenotype, which may partially explain differences in postoperative outcomes.²³

Stoma-related complications were mild and limited, likely due to careful site selection and proactive stoma care.^{12,13,21} Nutrition and anastomotic safety further differentiate the two approaches. Early enteral feeding after colostomy supports gastrointestinal recovery, whereas subtotal colectomy requires delayed feeding to ensure anastomotic security, emphasizing the importance of preoperative nutritional optimization.²²⁻²⁴

Given the small sample size, this study should be interpreted descriptively rather than as hypothesis-testing, and statistical p-values should be considered with caution.^{1,6} Nevertheless, the observed trends provide clinically relevant information about the relative advantages of colostomy and subtotal colectomy in this patient population.

In practical terms, colostomy may be preferable for hemodynamically fragile, highly comorbid patients requiring rapid symptom relief and early functional recovery, while subtotal colectomy can be considered in patients with recurrent, refractory distension and significant colonic dilatation, once infection control and nutritional optimization are achieved.^{11,14,17,20} Decisions should integrate frailty assessment, comorbidity profile, infection control, and patient preferences within a multidisciplinary framework.^{17,20}

In conclusion, colostomy offers short-term recovery advantages, including operative time, ICU/hospital stay, and early feeding, while subtotal colectomy, despite a higher perioperative burden, may provide improved mid-term outcomes and prevent ileus recurrence. Due to the small sample size, these findings should be interpreted cautiously, and larger, prospective studies are needed to validate

these observations and guide evidence-based surgical decision-making.

5. Conclusion

In elderly patients with paralytic ileus unresponsive to conservative/minimally invasive therapy, colostomy provides faster early recovery; subtotal colectomy yields superior mid-term outcomes, with no ileus recurrence and improved quality of life. Surgical choice should be individualized using a multidisciplinary approach, considering frailty, nutrition, infection control, and patient preferences. Multicenter prospective studies are warranted to validate these findings.

Statement of ethics

This study was approved by the Van Yüzüncü Yıl University Non-Interventional Clinical Research Ethics Committee (Decision No: 2025/04-16, Date: 25/04/2025). The study was conducted following the principles of the Declaration of Helsinki.

genAI

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Conflict of interest statement

The authors declare that they have no conflict of interest.

Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author upon reasonable request.

Author contributions

Both authors contributed equally to the article. Both authors read and approved the final manuscript.

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