

Evaluation of the Impact of Preoperative Bowel Habits on the Success of Hemorrhoid Surgery: A Retrospective Observational Study of Grade III and IV Patients

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ABSTRACT

Introduction: Hemorrhoidal disease is a common anorectal disorder that can significantly impair quality of life. While hemorrhoidectomy remains an effective treatment for advanced cases, individual factors such as gastrointestinal function may influence surgical success. This study aimed to quantify and evaluate the impact of preoperative bowel habits, particularly chronic constipation, on postoperative outcomes following hemorrhoid surgery in patients with advanced (grade III and IV) hemorrhoidal disease.

Methods: In this retrospective observational study, we analyzed 120 adult patients with grade III or IV hemorrhoids who underwent open or stapled hemorrhoidectomy between January 2020 and December 2024 at a single tertiary center. Preoperative bowel patterns were assessed using the Rome IV criteria, Bristol Stool Form Scale, and the Constipation Severity Instrument (CSI). Surgical success at six months was defined by the complete triple criteria complete wound healing, absence of significant pain [Visual Analog Scale (VAS) score of 2 or less], and no clinical recurrence of prolapse or bleeding. Postoperative outcomes, including complications, pain, healing duration, and recurrence, were compared between patients with and without preoperative chronic constipation.

Results: Chronic constipation was identified in 40.8% of patients. Surgical success was significantly lower in constipated patients (72.4%) compared to non-constipated individuals (91.7%, $p=0.011$). Constipation was also associated with longer healing times (mean 29.4 ± 6.8 vs. mean 22.1 ± 5.5 days, $p<0.001$), higher pain scores (VAS median: 4.0 vs. 2.0, $p=0.004$), and greater recurrence (at 6 months: 16.3% vs. 3.6%, $p=0.018$). Multivariate analysis confirmed chronic constipation [odds ratio (OR): 2.9] and CSI ≥ 20 (OR: 3.5) as independent predictors of surgical failure.

Conclusion: Preoperative constipation is a significant predictor of poorer 6-month outcomes following hemorrhoidectomy for advanced disease. These findings provide novel, quantifiable evidence supporting the need for systematic preoperative bowel assessment. Assessing and managing bowel habits preoperatively may enhance surgical success and reduce postoperative morbidity.

Keywords: Hemorrhoidal disease, constipation, bowel habits, surgical outcomes, hemorrhoidectomy, postoperative complications, Milligan-Morgan, stapled hemorrhoidopexy

Introduction

Hemorrhoidal disease is one of the most prevalent anorectal disorders worldwide, affecting approximately 4% of the adult population and representing a leading cause of outpatient colorectal consultations (1). It is characterized by symptomatic enlargement and distal displacement of the normal anal cushions, manifesting clinically with symptoms such as rectal bleeding, prolapse, itching, and discomfort (2). When conservative management fails, surgical intervention becomes necessary, particularly

in cases classified as grade III or IV by the Goligher classification (3). Identifying patient-specific risk factors is essential for minimizing morbidity and optimizing patient selection for surgery.

Among the various surgical techniques, open hemorrhoidectomy (Milligan-Morgan procedure) and stapled hemorrhoidopexy (Longo technique) remain the most widely used methods due to their proven efficacy and long-term results (4). However, despite the technical success of these procedures, a considerable proportion of patients experience



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suboptimal postoperative outcomes, including persistent pain, delayed healing, and recurrence (5). Such variability in outcomes has prompted a growing interest in identifying patient-specific factors that may influence the effectiveness of surgical treatment.

One such factor is gastrointestinal motility, including defecation patterns, particularly chronic constipation. Chronic constipation, defined by the Rome IV criteria, includes infrequent bowel movements, hard stools, straining, and a sensation of incomplete evacuation lasting for at least three months (6). It is a common complaint in the general population, with a reported prevalence ranging between 14% and 24% (7). The pathophysiology of constipation often involves colonic dysmotility, pelvic floor dysfunction, and defecatory disorders, all of which may adversely affect postoperative healing in anorectal surgery (8).

The link between constipation and hemorrhoidal disease is bidirectional. On the one hand, chronic straining and prolonged defecation are recognized risk factors for the development and progression of hemorrhoids. On the other hand patients undergoing surgery for hemorrhoidal disease may already have preexisting dysfunctional defecation patterns that complicate postoperative recovery (9). Furthermore, postoperative constipation can exacerbate pain, lead to surgical site trauma, and increase the likelihood of recurrence, making bowel regulation a critical aspect of patient management (10).

Several studies have highlighted the clinical implications of constipation in surgical populations. For example, Iyigun et al. (11) demonstrated that patients undergoing cardiac surgery with preoperative constipation were more likely to develop postoperative bowel dysfunction. In the context of colorectal and anorectal procedures, Bouchoucha et al. (12) emphasized the role of functional constipation as part of a broader colonic motility disorder that may impact surgical outcomes. However, specific quantitative data defining the relationship between preoperative chronic constipation, as diagnosed by established criteria, and postoperative outcomes in hemorrhoid surgery remain scarce and anecdotal.

Given this background, this study aims to address a critical research gap by systematically evaluating the impact of preoperative bowel habits—particularly the presence of chronic constipation—on the clinical success of hemorrhoidectomy. We hypothesize that patients with a history of constipation will experience poorer surgical outcomes, increased postoperative complications, and delayed recovery. Understanding this relationship cannot only help refine preoperative risk stratification but may also inform perioperative management strategies, including targeted bowel regulation protocols.

In this retrospective observational study, we assessed the defecatory habits of patients prior to undergoing hemorrhoid surgery using validated tools such as the Rome IV criteria, Bristol Stool Form Scale (BSFS), and the Constipation Severity Instrument (CSI). We then correlate these findings with postoperative outcomes over a six-month follow-up period, including rates of pain, wound healing, complications, and recurrence. Ultimately, the goal is to determine whether preoperative bowel dysfunction is a potentially modifiable risk factor that, if addressed appropriately, could lead to improved outcomes in hemorrhoid surgery.

Methods

Study Design and Setting

This study was designed as a retrospective, single-center, observational analysis conducted at the University of Health Sciences Türkiye, Ümraniye Training and Research Hospital Colorectal Surgery Unit of a tertiary care hospital. Patient records from January 2020 to December 2024 were retrospectively reviewed to evaluate individuals who underwent surgical intervention for hemorrhoidal disease. The study was approved by the Ethics Committee of Scientific Research, University of Health Sciences Türkiye, Ümraniye Training and Research Hospital (approval number: 219, date: 10.07.2025), and all data were anonymized in accordance with the principles outlined in the Declaration of Helsinki and national regulations related to data privacy. The study was designed and reported according to the Strengthening the Reporting of Observational Studies in Epidemiology guidelines for observational studies.

Study Population

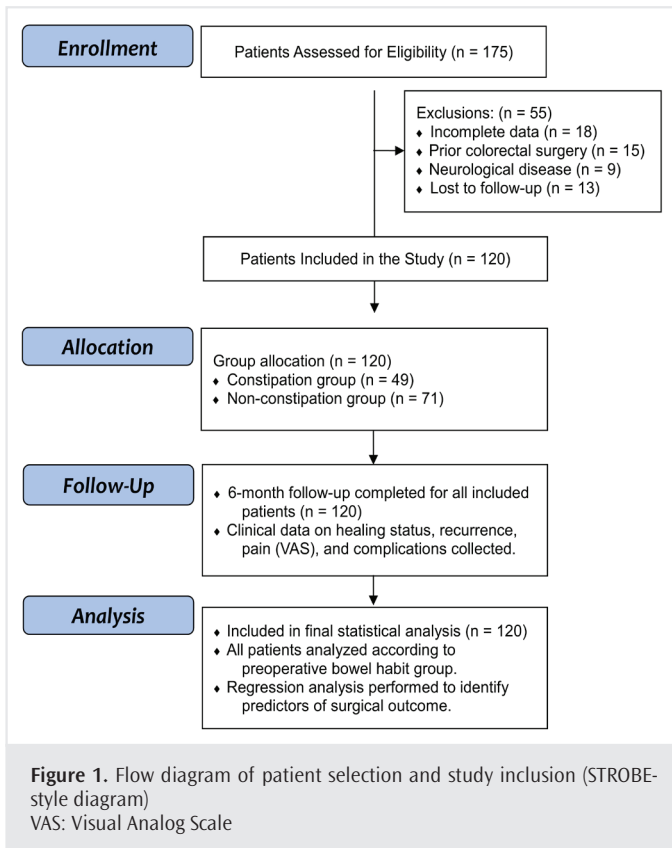
Adult patients aged 18 years or older who had undergone either open hemorrhoidectomy (Milligan-Morgan technique) or stapled hemorrhoidopexy (Longo technique) for grade III or grade IV hemorrhoidal disease were eligible for inclusion. The choice between open and stapled techniques was determined by the attending surgeon's preference and institutional guidelines. Only those with fully documented preoperative bowel habit data and complete postoperative follow-up information at six months were considered. Patients were excluded if they had a history of inflammatory bowel disease, colorectal cancer, prior major anorectal surgery, or constipation secondary to neurologic diseases such as Parkinson's disease or multiple sclerosis. Patients lacking postoperative follow-up data were also excluded to maintain outcome validity.

Sample Size and Data Collection

The sample size calculation was conducted to ensure adequate statistical power for the a priori defined primary outcome. Based on power analysis targeting a 95% confidence interval (CI) and 90% statistical power, with an assumed 15% difference in surgical success rates between constipated and non-constipated patients (80% vs. 95%) and a two-sided Chi-square test, the minimum required sample size was estimated at 115 patients. To account for potential data loss or exclusions, a total of 120 patients were ultimately included in the study. Due to the retrospective nature of the study, the power analysis was used to confirm that the available sample size was sufficient post hoc to detect the minimum hypothesized effect size (13). Data were extracted from the hospital's digital information system and verified through physical patient files where necessary. Figure 1 presents a flow diagram of the study, detailing patient selection, exclusion, and the number of participants assessed at each stage of the study.

Variables and Definitions

Collected variables included demographic information such as age, sex, and body mass index (BMI), as well as clinical characteristics including comorbid conditions and the Goligher grade of hemorrhoidal disease.



Preoperative bowel function: Preoperative bowel function was evaluated using the Rome IV criteria for chronic constipation. According to these criteria, a diagnosis of constipation required the presence of at least two of the following symptoms for a duration of three months or more: straining during defecation, lumpy or hard stools, sensation of incomplete evacuation, anorectal obstruction, manual maneuvers to aid defecation, or fewer than three spontaneous bowel movements per week. Stool consistency was categorized using the BSFS, while the severity of constipation was quantified using the CSI, with scores of 20 or above considered to indicate moderate to severe constipation. The data for these validated instruments were extracted from structured patient questionnaires and physicians' notes completed as part of the standard preoperative consultation process.

Due to the retrospective nature of the study, the potential for recall bias or variability in documentation exist, and this is acknowledged as a limitation.

Primary Outcome: Surgical Success

Surgical success was strictly defined as the simultaneous presence of three criteria at the six-month follow-up visit:

1. **Complete wound healing:** Full epithelialization of the surgical site.
2. **Absence of significant pain:** Visual Analog Scale (VAS) score <3 of 2 or less.
3. **No clinical recurrence:** Absence of new prolapse, recurrent bleeding requiring intervention, or the presence of a symptomatic palpable anal mass.

Secondary outcomes: Secondary outcomes included pain scores (VAS), healing duration (in days, until full epithelialization), recurrence (at 6 months), and overall postoperative complications (Clavien-Dindo grade II or higher).

Statistical Analysis

Statistical analyses were performed using SPSS version 25.0. Normality of distribution for continuous variables was assessed using the Shapiro-Wilk test. Continuous variables were presented as means with standard deviations or medians with interquartile ranges (IQRs), depending on the distribution. Categorical variables were summarized using frequencies and percentages. Comparative analyses between groups were performed using the independent samples t-test or Mann-Whitney U test for continuous variables, and chi-square or Fisher's exact test for categorical variables. To identify predictors of surgical failure, multivariate logistic regression was conducted, adjusting for age, BMI, type of surgery, Goligher grade, and constipation severity. In the multivariate model, "chronic constipation" (Rome IV diagnosis) and "CSI score ≥ 20 " were included as distinct predictors to evaluate their independent associations with surgical failure. While these variables are related, they represent different aspects of constipation (diagnosis versus severity), and initial checks confirmed acceptable levels of collinearity for their simultaneous inclusion in the model. Statistical significance was established at a p-value of less than 0.05. The sample size calculation was performed using GPower 3.1.

Results

Patient Characteristics

A total of 120 patients met all inclusion criteria and were included in the final analysis. The mean age of the overall cohort was 44.6 years with a standard deviation of 12.7 years. Of these, 65 patients, accounting for 54.2% of the sample, were female. Preoperative constipation, as defined by the Rome IV criteria, was identified in 49 patients, corresponding to a prevalence of 40.8%. There were no statistically significant differences between the constipation and non-constipation groups in terms of age, sex distribution, BMI, or type of hemorrhoid surgery performed. Both open and stapled hemorrhoidectomy were evenly distributed between the groups, as shown in Table 1, which presents baseline demographic and clinical characteristics.

Surgical Success and Primary Outcome

Surgical success at six months was achieved in 96 patients, representing an overall success rate of 80%. However, when outcomes were stratified by preoperative bowel habits, a clear disparity emerged. In the constipation group, only 72.4% of patients achieved surgical success, compared to 91.7% in the non-constipation group. This difference was statistically significant, with a p-value of 0.011, indicating that preoperative constipation was associated with a lower likelihood of successful surgical outcomes.

Pain and Healing Duration

Pain severity, assessed using the VAS, was significantly higher in patients with constipation. The constipation group reported a median VAS score

Table 1. Patient demographics and preoperative characteristics

Variable	All patients (n=120)	Constipation (n=49)	No constipation (n=71)	p-value
Age (mean ± SD)	44.6±12.7	46.2±13.1	43.4±12.2	0.218
Female, n (%)	65 (54.2%)	30 (61.2%)	35 (49.3%)	0.176
BMI (kg/m²)	26.8±4.1	27.5±4.4	26.2±3.8	0.148
Goligher grade IV, n (%)	14 (11.7%)	7 (14.3%)	7 (9.9%)	0.345
Open hemorrhoidectomy	77 (64.2%)	31 (63.3%)	46 (64.8%)	0.864
Stapled hemorrhoidopexy	43 (35.8%)	18 (36.7%)	25 (35.2%)	

SD: Standard deviation, BMI: Body mass index

Table 2. Postoperative outcomes by constipation status

Outcome	Constipation (n=49)	No constipation (n=71)	p-value
Surgical success (%)	72.4%	91.7%	0.011
Pain score (VAS) median (IQR)	4.0 (2-7)	2.0 (1-4)	0.004
Healing time (days) (mean ± SD)	29.4±6.8	22.1±5.5	<0.001
Recurrence (at 6-months) (%)	16.3%	3.6%	0.018
Complication rate (Clavien-Dindo II or higher) (%)	22.4%	8.5%	0.031

SD: Standard deviation, VAS: Visual Analog Scale, IQR: Interquartile range

Table 3. Multivariate logistic regression analysis

Variable	OR (95% CI)	p-value
Chronic constipation	2.9 (1.4-6.1)	0.004
CSI score ≥20	3.5 (1.7-7.0)	0.001
Age ≥50	1.3 (0.6-2.8)	0.487
Open hemorrhoidectomy	1.1 (0.5-2.3)	0.782
Goligher grade IV	1.4 (0.4-4.9)	0.589

OR: Odds ratio, CI: Confidence interval, CSI: Constipation Severity Instrument

of 4.0 (IQR: 2-7), while patients without constipation had a median score of 2.0 (IQR: 1-4). The difference in pain perception was statistically significant (p=0.004), suggesting that postoperative constipation may contribute to increased discomfort during the recovery period. In terms of wound healing, patients with constipation required an average of 29.4±6.8 days for complete epithelialization, compared to 22.1±5.5 days in the non-constipation group. This prolonged recovery time was statistically significant (p<0.001) and may reflect the adverse effects of defecatory strain and delayed mucosal recovery.

Recurrence and Complications

Recurrence of hemorrhoidal symptoms, such as prolapse, bleeding, or the presence of new symptomatic disease, was more frequently observed in the constipation group. Six-month recurrence rates were 16.3% in constipated patients and 3.6% in those without constipation, a difference that was both clinically and statistically significant with a p-value of 0.018. Additionally, the overall rate of postoperative complications (Clavien-Dindo II or higher) was notably higher in the constipation group, with 22.4% of patients experiencing events such as infection, bleeding, or urinary retention. This was in contrast to an 8.5% complication rate in the non-constipation group (p=0.031), further emphasizing the negative impact of bowel dysfunction on postoperative outcomes. These findings are summarized in Table 2.

Predictors of Surgical Failure

Multivariate logistic regression analysis was performed to identify independent predictors of surgical failure. The presence of chronic constipation was associated with a nearly threefold increase in the odds of surgical failure, with an odds ratio of 2.9 and a 95% CI ranging from 1.4 to 6.1 (p=0.004). Additionally, patients with a CSI score of 20 or higher had a 3.5-fold increased risk of treatment failure (odds ratio: 3.5; 95% CI: 1.7-7.0; p=0.001). These results remained significant after adjusting for other factors such as age and type of surgery, as shown in Table 3. These data underscore the relevance of both the presence and severity of constipation as meaningful predictors of poor postoperative outcomes in hemorrhoidectomy patients.

Discussion

This retrospective observational study demonstrates a significant and independent association between preoperative bowel habits, particularly chronic constipation, and adverse postoperative outcomes following hemorrhoid surgery. Patients with constipation had lower surgical success rates, more complications, longer healing durations, and greater recurrence rates than those without constipation. These findings support our initial hypothesis and add to the growing body of evidence linking gastrointestinal motility with anorectal surgical outcomes.

Interpretation of Findings

Our results revealed that 40.8% of patients had preoperative constipation based on the Rome IV criteria, a prevalence that is higher than in the general population and may reflect the known association between constipation and hemorrhoidal disease progression (1). Within this subgroup, the rate of surgical success was significantly lower (72.4%) compared to patients without constipation (91.7%), underscoring the potential role of bowel dysfunction in surgical recovery. The observed differences in healing time and postoperative pain may be attributable

to increased intrarectal pressure during defecation, mechanical stress on the surgical wound, impaired local perfusion, and mucosal trauma associated with hard stools and straining (6,7).

Constipation severity, as assessed by the CSI, was also independently associated with poor outcomes. This suggests that symptom intensity, not just the presence of constipation, may affect surgical prognosis. Our multivariate regression identified both chronic constipation and CSI score ≥ 20 as significant, independent predictors of surgical failure, emphasizing the need for nuanced preoperative assessment.

Comparison with Previous Studies

While constipation's impact on abdominal and cardiac surgery has been explored (11), limited studies have specifically addressed hemorrhoidectomy outcomes. Iygun et al. (11) demonstrated a link between preoperative constipation and postoperative dysfunction in cardiac surgery patients, and Bouchoucha et al. (12) described constipation as part of a broader spectrum of colonic dysmotility contributing to anorectal dysfunction. The lack of detailed, quantitative evidence for hemorrhoid surgery meant that preoperative bowel management was largely based on expert opinion (10). Our study is one of the first to quantify and statistically validate the role of preoperative constipation in predicting hemorrhoid surgery outcomes using validated scoring systems.

Clinical Context and Etiology

The management of hemorrhoidal disease requires a deep understanding of its basic pathophysiology, which involves the deterioration of supporting connective tissue in the anal cushions, leading to displacement and symptomatic enlargement (14). While mechanical factors such as chronic straining, prolonged sitting, and hard stools are central to the development and progression of hemorrhoids, the clinical presentation often varies widely, ranging from intermittent bleeding to chronic prolapse (15). For grade III and IV hemorrhoids, surgical intervention is typically indicated and aims to eliminate prolapse and bleeding while minimizing postoperative morbidity (15). Given this complex etiology, the long-term success of surgery is highly dependent not only on the technical execution but also on the effective management of these underlying predisposing factors, chief among them dysfunctional bowel habits (14). Therefore, identifying patients with preoperative chronic constipation who are at higher risk for failure is a crucial step in optimizing surgical outcomes.

Clinical Implications

These findings highlight the importance of systematic evaluation of bowel habits prior to hemorrhoid surgery. Incorporating screening tools such as the Rome IV questionnaire, BSFS, and CSI in preoperative assessment could help stratify patient risk and guide targeted interventions. For high-risk patients (Rome IV positive and/or CSI ≥ 20), prophylactic bowel regulation strategies, including dietary modifications, laxatives, or pelvic floor therapy, should be initiated preoperatively.

Additionally, recognizing constipation as a modifiable risk factor offers an opportunity to refine surgical planning. For instance, patients with severe constipation may benefit from conservative treatment prior to surgery or alternative approaches that reduce postoperative straining.

Study Limitations

Despite its strengths, this study has inherent limitations due to its retrospective design. Its retrospective design may introduce selection bias, and reliance on documented patient-reported symptoms could lead to misclassification. Specifically, the retrospective application of the Rome IV criteria, BSFS, and CSI is a notable limitation, as these instruments are ideally administered prospectively to ensure complete and accurate patient recall of bowel habits. The single-center nature of the study limits generalizability. Moreover, follow-up was limited to six months, which may underestimate long-term recurrence. Finally, while we confirmed all surgeries were performed by experienced colorectal surgeons following standardized protocols, individual variations in surgical technique and surgical teams may still exist. Future prospective, multicenter studies with standardized bowel management protocols are needed to confirm these findings and establish evidence-based guidelines for perioperative bowel care in hemorrhoid surgery.

Conclusion

This study confirms that chronic constipation is a significant and independent predictor of poorer surgical outcomes following hemorrhoidectomy. Patients with constipation experienced more pain, longer healing periods, and a higher risk of recurrence and complications. Importantly, both the presence and severity of constipation, as assessed by standardized tools, were associated with these adverse outcomes.

Systematic evaluation of bowel habits before surgery should become a routine part of preoperative assessment for patients undergoing hemorrhoidectomy. By identifying and addressing constipation in advance, clinicians may improve the likelihood of successful recovery and reduce the burden of postoperative morbidity. These findings support a more integrated approach to patient care—one that combines surgical intervention with gastrointestinal functional optimization to enhance treatment outcomes.

Ethics

Ethics Committee Approval: The study was approved by the Ethics Committee of Scientific Research, Ümraniye Training and Research Hospital (approval number: 219, date: 10.07.2025).

Informed Consent: Retrospective study.

Footnotes

Authorship Contributions: Surgical and Medical Practices - İ.K., T.C.; Concept - İ.K., F.B.; Design - İ.K., T.C., A.A., F.B.; Data Collection or Processing - H.T., Y.K.Ç., O.E.; Analysis or Interpretation - H.T., Y.K.Ç., O.E., A.A.; Literature Search - H.T., O.E.; Writing - İ.K., Y.K.Ç., T.C., A.A., F.B.

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