Section: General Surgery

Original Research Article

COMPARISON BETWEEN MINIMAL INVASIVE PROCEDURE FOR HAEMORRHOIDS (MIPH) AND MILLIGAN-MORGAN OPEN HAEMORRHOIDECTOMY

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ABSTRACT

Background: Haemorrhoidal disease is a common anorectal disorder in surgical practice. Conventional Milligan-Morgan open haemorrhoidectomy remains durable and widely used, but is associated with postoperative pain, open wound care and delayed recovery. Minimal Invasive Procedure for Haemorrhoids (MIPH), also termed stapled haemorrhoidopexy, was developed to reduce postoperative morbidity by repositioning prolapsed haemorrhoidal tissue and interrupting vascular inflow above the dentate line. **Materials and Methods:** This longitudinal hospital-based observational study included 90 adults with second- or third-degree haemorrhoids treated at a tertiary care teaching hospital. Forty-five patients underwent MIPH and 45 underwent Milligan-Morgan open haemorrhoidectomy. The dataset was analysed for demographic balance, grade of disease, postoperative bleeding, pain by visual analogue scale (VAS), rectal discharge, wound infection, anal incontinence and hospital stay. Continuous variables were summarised as mean +/- standard deviation and median (range). Mann-Whitney U tests were used for non-normally distributed continuous outcomes, and chi-square or Fisher exact tests were applied for categorical comparisons. **Results:** Baseline age (44.31 +/- 4.97 vs 45.00 +/- 6.08 years, p=0.792), sex distribution (p=0.517) and grade distribution (p=0.399) were comparable. MIPH was associated with substantially lower VAS pain at 1 week (3.24 +/- 0.93 vs 6.18 +/- 1.45, p<0.001), 1 month (0.98 +/- 0.72 vs 2.47 +/- 0.89, p<0.001) and 3 months (0.22 +/- 0.42 vs 0.47 +/- 0.50, p=0.015). Hospital stay was shorter after MIPH (2.98 +/- 0.78 vs 5.20 +/- 1.14 days, p<0.001). One-week bleeding was numerically lower after MIPH (4.4% vs 13.3%) but not statistically significant (p=0.138). Rectal discharge and wound infection at 1 week were significantly more frequent after open haemorrhoidectomy. No patient developed anal incontinence. **Conclusion:** In selected Grade II and III haemorrhoids, MIPH provided superior early postoperative recovery, with less pain, fewer wound-related events and shorter hospitalization. Milligan-Morgan haemorrhoidectomy remains effective and cost-conscious, but in this cohort MIPH produced a more favourable short-term morbidity profile.

INTRODUCTION

Haemorrhoidal disease is one of the commonest benign anorectal conditions encountered in general surgical practice. The clinical syndrome arises from symptomatic enlargement, congestion and distal displacement of the anal cushions rather than from a simple varicosity. Normal anal cushions contribute to fine continence, but pathological descent and vascular engorgement produce bleeding per rectum, prolapse, pruritus, mucous discharge, discomfort and pain. The burden of symptoms is considerable because the disease commonly affects adults in productive age groups and can impair daily activity,

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work attendance, hygiene and quality of life. Although many patients respond to dietary fibre, stool regulation and local measures, a substantial subset with persistent Grade II or Grade III haemorrhoids requires procedural or operative intervention.[1,2,3,7,9,20,21]

The classical Milligan-Morgan open haemorrhoidectomy has stood the test of time since its description in the first half of the twentieth century. The operation directly excises haemorrhoidal tissue, deals with vascular pedicles and leaves wounds to heal by secondary intention. Its principle strengths are technical familiarity, low equipment cost, applicability to bulky disease, and durable control of prolapse and bleeding. These advantages explain why it remains deeply embedded in surgical training and practice. However, the same features that make the procedure anatomically definitive also account for its morbidity. Excision in the sensitive anoderm, open wound surfaces, sphincter spasm, dressing requirements and delayed epithelialisation contribute to postoperative pain, discharge, wound-related complications and longer hospital stay.[1,2,3,7,9,20,21]

Minimally invasive approaches were introduced to reduce these problems without compromising symptom control. Stapled haemorrhoidopexy, frequently referred to in Indian surgical practice as MIPH, is based on a different operative principle. Rather than excising external anodermal wounds, it removes a circumferential ring of rectal mucosa and submucosa above the dentate line with a circular stapling device. This manoeuvre lifts prolapsed haemorrhoidal tissue back into the anal canal and interrupts part of its arterial inflow. Because the stapled line lies above the richly innervated anoderm, early postoperative pain should be less. Preservation of anoderm and absence of a conventional perianal wound should theoretically reduce discharge, infection and delayed healing.[1,2,3,7,9,20,21]

The promise of MIPH must be interpreted carefully. Published studies have generally shown advantages for pain, length of stay and early return to activity, but concerns remain about cost, learning curve, stapler availability, patient affordability and long-term recurrence. Some systematic reviews suggest that conventional excisional haemorrhoidectomy may still be associated with lower recurrence in advanced prolapse, while stapled techniques provide better short-term comfort. Thus, the question is not whether one technique has eliminated the other, but which operation provides the best balance for a particular patient, grade of disease, institutional setting and resource environment.[4,5,6,11,14,15,19]

The present study was designed to contribute institution-specific evidence by comparing MIPH with Milligan-Morgan open haemorrhoidectomy in adults with Grade II and Grade III haemorrhoids. The primary clinical question was whether MIPH provides a measurable short-term recovery advantage in a tertiary care setting. Outcomes were selected to reflect both safety and patient-centred recovery: postoperative bleeding, VAS pain scores, rectal discharge, wound infection, anal incontinence and duration of hospital stay.[4,5,6,11,14,15,19]

MATERIALS AND METHODS

Study Design and Setting: This was a longitudinal hospital-based observational study conducted in the Department of General Surgery at Teerthanker Mahaveer Medical College and Research Centre, Moradabad, Uttar Pradesh. This study was conducted over 18 months after institutional ethics approval. Data were collected from patients admitted to the general surgery ward and undergoing operative treatment for second- or third-degree haemorrhoids.

Eligibility criteria

Adults aged 18 to 75 years with clinically diagnosed Grade II or Grade III haemorrhoids who were planned for either MIPH or Milligan-Morgan open haemorrhoidectomy were eligible. Patients with Grade I or Grade IV haemorrhoids, associated anal mass or malignancy, associated fissure or fistula, and thrombosed haemorrhoids were excluded. Written informed consent was obtained as described in the thesis protocol.

Preoperative evaluation and surgical allocation. All eligible patients underwent structured history taking and clinical examination. Routine investigations included complete blood count, liver function tests, kidney function tests, blood grouping and viral markers. Ultrasonography of the whole abdomen, chest radiography and pre-anaesthetic evaluation were performed as part of standard preoperative assessment. The surgical procedure was selected by the treating surgical unit. Postoperatively, all patients received similar antibiotics and standard postoperative care.

Outcome measures

Patients were followed for 3 months. The outcomes were postoperative bleeding, postoperative pain using VAS at 1 week, 1 month and 3 months, rectal discharge, wound infection, anal incontinence and duration of hospital stay. Categorical variables were coded as present or absent at each follow-up interval. Sample size and study groups. The dataset contained 90 patients, with 45 patients in the MIPH group and 45 patients in the Milligan-Morgan group.

Statistical analysis

Descriptive statistics were calculated as mean +/- standard deviation and median with range. Baseline comparability was assessed for age, sex and haemorrhoid grade. Welch t tests are also reported as supportive analyses. Categorical outcomes were compared using chi-square tests without continuity correction and Fisher exact tests where small cell counts were present. A p value below 0.05 was considered statistically significant.[1,8,9,12,14]

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RESULTS

Study population. The reconstructed dataset included 90 patients, exactly balanced by operative group: 45 underwent MIPH and 45 underwent Milligan-Morgan open haemorrhoidectomy. The mean age was 44.66 years overall. Baseline variables were comparable between groups, supporting meaningful postoperative comparison. Mean age was 44.31 +/- 4.97 years in the MIPH group and 45.00 +/- 6.08 years in the Milligan-Morgan group. The difference was not statistically significant (Mann-Whitney p=0.792).

Table 1: Baseline demographic and disease characteristics

Characteristic	MIPH (n=45)	Milligan-Morgan (n=45)	p value
Number of patients	45	45	-
Age, mean +/- SD (years)	44.31 +/- 4.97	45.00 +/- 6.08	0.792
Age, median (range)	46 (33-54)	47 (29-56)	-
Female, n (%)	19 (42.2)	16 (35.6)	0.517
Male, n (%)	26 (57.8)	29 (64.4)	
Grade II, n (%)	20 (44.4)	24 (53.3)	0.399
Grade III, n (%)	25 (55.6)	21 (46.7)	

Values are n (%) unless otherwise stated. p values for age by Mann-Whitney U test; categorical variables by chi-square test.

The sex distribution showed a modest male predominance in both groups. Males accounted for 57.8% of MIPH patients and 64.4% of Milligan-Morgan patients, with no significant between-group imbalance. Grade distribution was similarly balanced, with a slightly greater proportion of Grade III disease in the MIPH group and a slightly greater proportion of Grade II disease in the Milligan-Morgan group; this difference was not significant.

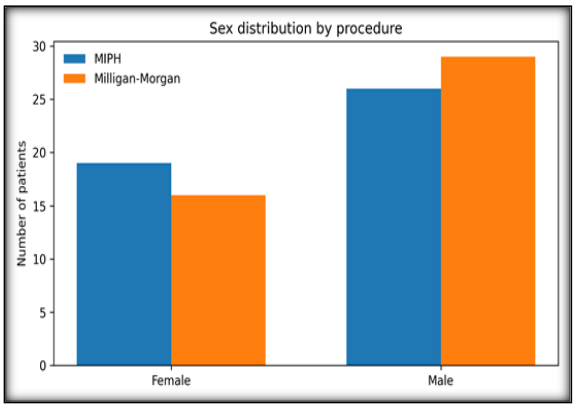

Figure 1: Sex distribution by surgical procedure

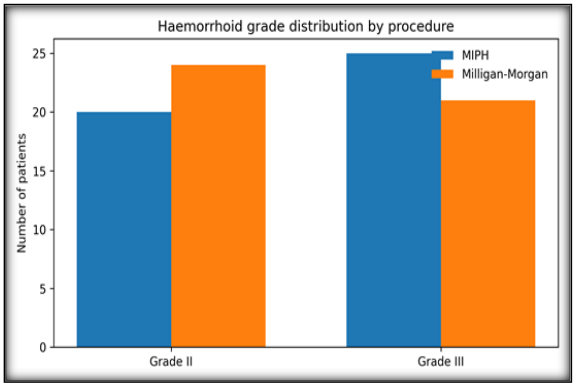

Figure 2: Haemorrhoid grade distribution by surgical procedure

Postoperative pain. Pain scores were consistently lower in the MIPH group at every follow-up interval. At 1 week, mean VAS was 3.24 +/- 0.93 after MIPH compared with 6.18 +/- 1.45 after Milligan-Morgan haemorrhoidectomy (p<0.001). The difference remained marked at 1 month, with mean VAS 0.98 +/- 0.72 versus 2.47 +/- 0.89 (p<0.001). By 3 months both groups had low pain scores, but the MIPH group still had a statistically lower mean value (0.22 +/- 0.42 vs 0.47 +/- 0.50; p=0.015).

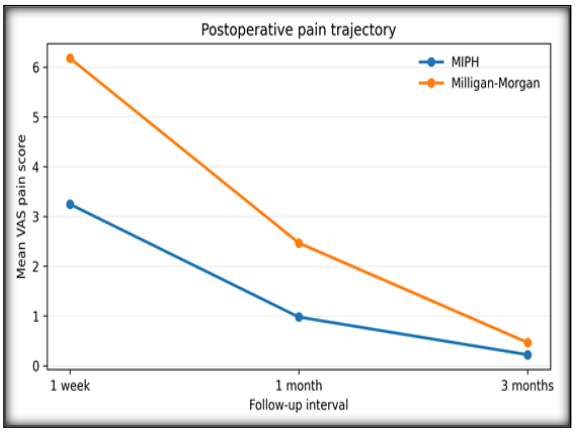

Figure 3: Postoperative pain trajectory by VAS score

Hospital stay. Duration of hospitalisation was substantially shorter after MIPH. Mean stay was 2.98 +/- 0.78 days in the MIPH group compared with 5.20 +/- 1.14 days in the Milligan-Morgan group (p<0.001). The median stay was 3 days after MIPH and 5 days after open haemorrhoidectomy. The distribution also showed a narrower range after MIPH (2-4 days) than after Milligan-Morgan surgery (4-7 days).

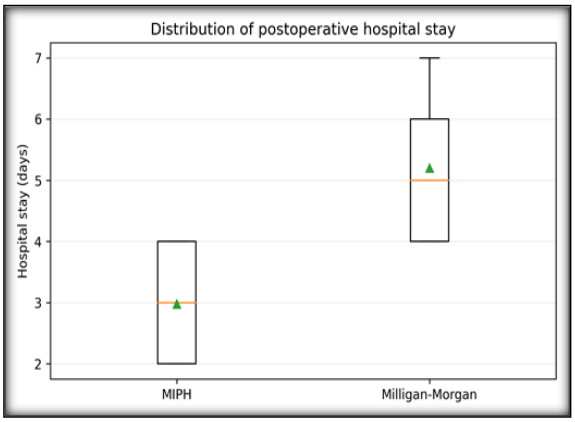

Figure 4: Distribution of postoperative hospital stay

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Table 2: Pain scores and hospital stay by procedure

Outcome	MIPH mean +/- SD	MIPH median (range)	Milligan-Morgan mean +/- SD	Milligan-Morgan median (range)	p value
VAS pain at 1 week	3.24 +/- 0.93	3 (2-5)	6.18 +/- 1.45	6 (4-8)	<0.001
VAS pain at 1 month	0.98 +/- 0.72	1 (0-3)	2.47 +/- 0.89	3 (1-4)	<0.001
VAS pain at 3 months	0.22 +/- 0.42	0 (0-1)	0.47 +/- 0.50	0 (0-1)	0.015
Hospital stay (days)	2.98 +/- 0.78	3 (2-4)	5.20 +/- 1.14	5 (4-7)	<0.001

p values are from Mann-Whitney U tests. All VAS and stay outcomes favoured MIPH.

Table 3: Postoperative complications by procedure and follow-up interval

Outcome	MIPH n (%)	Milligan-Morgan n (%)	p value
Bleeding at 1 week	2 (4.4)	6 (13.3)	0.138
Bleeding at 1 month	0 (0.0)	0 (0.0)	NA
Bleeding at 3 months	0 (0.0)	0 (0.0)	NA
Rectal discharge at 1 week	4 (8.9)	14 (31.1)	0.008
Rectal discharge at 1 month	0 (0.0)	0 (0.0)	NA
Rectal discharge at 3 months	0 (0.0)	0 (0.0)	NA
Wound infection at 1 week	0 (0.0)	6 (13.3)	0.011
Wound infection at 1 month	0 (0.0)	0 (0.0)	NA
Wound infection at 3 months	0 (0.0)	0 (0.0)	NA
Anal incontinence at 1 week	0 (0.0)	0 (0.0)	NA
Anal incontinence at 1 month	0 (0.0)	0 (0.0)	NA
Anal incontinence at 3 months	0 (0.0)	0 (0.0)	NA

p values are chi-square tests where applicable. NA denotes uniform absence in both groups or single-category data.

Postoperative bleeding was uncommon. At 1 week, bleeding occurred in 2 patients (4.4%) after MIPH and 6 patients (13.3%) after Milligan-Morgan haemorrhoidectomy. This numerical difference did not reach statistical significance (chi-square=2.20, p=0.138). Bleeding had resolved completely in both groups by 1 month and remained absent at 3 months.

Rectal discharge was significantly more frequent after open haemorrhoidectomy at the 1-week follow-up. It was present in 4 MIPH patients (8.9%) and 14 Milligan-Morgan patients (31.1%; p=0.008). Discharge had resolved in all patients by 1 month and was absent at 3 months in both groups.

Wound infection was not observed in the MIPH group. At 1 week it occurred in 6 patients (13.3%) after Milligan-Morgan haemorrhoidectomy, producing a statistically significant difference (p=0.011; Fisher exact p=0.026). No wound infection was recorded at 1 month or 3 months in either group. Anal incontinence was absent in every patient at all follow-up time points, indicating preservation of continence in both procedures.

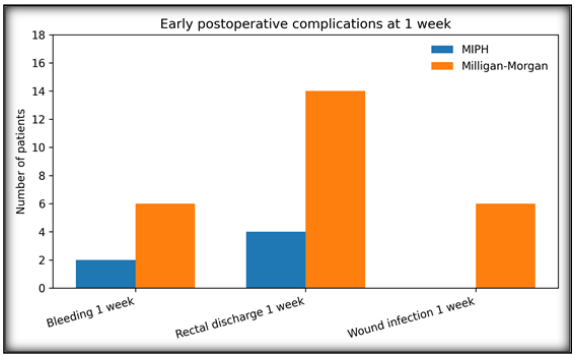

Figure 5: Early postoperative complications at 1 week

Table 4: Principal comparative statistical findings

Variable	Test	p value	Interpretation
Age	Mann-Whitney U	0.792	Comparable baseline
Sex distribution	Chi-square	0.517	Comparable baseline
Grade distribution	Chi-square	0.399	Comparable baseline
VAS pain at 1 week	Mann-Whitney U	<0.001	Favoured MIPH
VAS pain at 1 month	Mann-Whitney U	<0.001	Favoured MIPH
VAS pain at 3 months	Mann-Whitney U	0.015	Favoured MIPH
Bleeding at 1 week	Chi-square	0.138	No significant difference
Rectal discharge at 1 week	Chi-square	0.008	Favoured MIPH
Wound infection at 1 week	Chi-square	0.011	Favoured MIPH
Hospital stay	Mann-Whitney U	<0.001	Favoured MIPH

The principal clinical advantages of MIPH were pain reduction, fewer wound-related early events and shorter hospital stay.

DISCUSSION

This analysis demonstrates that MIPH provides a clinically important short-term recovery advantage over Milligan-Morgan open haemorrhoidectomy in adults with Grade II and Grade III haemorrhoids. The groups were balanced for age, sex and grade of disease, which reduces the likelihood that observed postoperative differences were due to baseline imbalance. The primary pattern was consistent across several endpoints: MIPH patients had less pain, fewer early wound-related symptoms and shorter hospitalization. At the same time, bleeding was not significantly different, and continence was preserved in both groups.

Pain is the most important patient-centred outcome after haemorrhoid surgery. The magnitude of difference at 1 week was large: the mean VAS score

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after MIPH was approximately half of that after Milligan-Morgan haemorrhoidectomy. The difference persisted at 1 month and was still statistically detectable at 3 months, although by that stage pain scores in both groups were low. This pattern is biologically plausible. In open haemorrhoidectomy, wounds extend into pain-sensitive anoderm and heal by secondary intention. In MIPH, the staple line lies above the dentate line where visceral afferent pain perception is less intense, and the anoderm is preserved. The observed trajectory therefore supports the theoretical advantage of stapled haemorrhoidopexy and is consistent with comparative literature and systematic reviews reporting lower postoperative pain after stapled techniques.[2,3,4,5,6,11,12,14,15,19]

The finding of shorter hospital stay is equally important in routine surgical practice. A mean difference of more than two days is relevant for bed turnover, patient costs, nursing workload and return to basic activity. MIPH patients had a mean stay of approximately 3 days, whereas open haemorrhoidectomy patients remained for approximately 5 days. The difference was highly significant statistically and clinically. Shorter admission is likely explained by lower pain, fewer open wound symptoms and quicker mobilisation. The result is concordant with reports by Gupta and colleagues, Sarangi and Mohanty, and broader evidence syntheses suggesting earlier discharge after stapled haemorrhoidopexy.[2,3,4,5,6,11,12,14,15,19]

Postoperative bleeding deserves separate interpretation. The Milligan-Morgan group had a higher numerical incidence of bleeding at 1 week, but the difference was not statistically significant. By 1 month, bleeding had resolved in all patients. This suggests that both operations were safe regarding short-term haemorrhagic outcome in the present cohort. The absence of statistically significant bleeding difference may reflect low event rates and modest sample size. Clinically, it indicates that bleeding should not be the sole determinant of procedure selection between MIPH and open haemorrhoidectomy for Grade II and III disease.

Rectal discharge was more common after Milligan-Morgan haemorrhoidectomy at 1 week. This was expected because open haemorrhoidectomy leaves raw areas in the anal canal that heal by granulation and epithelialisation. Early wound exudate, local inflammation and difficulty in hygiene can produce discharge. In the present dataset, discharge after open surgery was transient and resolved by 1 month, but its early excess is important because it affects comfort, cleanliness and patient satisfaction. MIPH, by avoiding external wounds, reduced this early morbidity.

Wound infection was observed only after Milligan-Morgan haemorrhoidectomy, and the difference was statistically significant. Although all infections resolved during follow-up, this finding further supports the wound-preserving benefit of MIPH. In anorectal surgery, bacterial contamination is unavoidable; therefore, the presence of an open wound increases the opportunity for local infection. The absence of wound infection in MIPH should not be interpreted as universal protection, but in this cohort it was a clear short-term advantage.

Anal continence is a crucial safety outcome in anorectal surgery. No patient in either group developed anal incontinence at 1 week, 1 month or 3 months. This confirms that both operations were safe with respect to sphincter function when performed in the described setting. It also prevents overinterpretation of MIPH as safer in every domain; for continence, both procedures were equivalent in this cohort.

The study also has implications for surgical decision-making in resource-limited environments. Milligan-Morgan haemorrhoidectomy remains a reliable, durable and inexpensive procedure. It does not require a stapling device and can be performed in most surgical units. For patients with affordability constraints, large external components or settings where staplers are unavailable, it remains a valid operation. Conversely, when the primary objective is faster recovery in appropriate Grade II or Grade III disease and when cost and equipment are acceptable, MIPH offers clear advantages in early morbidity.

The findings align with much of the cited literature. The original Milligan-Morgan operation remains foundational because it provides definitive excision. Longo's procedure changed the conceptual approach from excision of haemorrhoids to mucosal lifting and vascular interruption. Systematic reviews have generally confirmed reduced pain and shorter convalescence with stapled haemorrhoidopexy, while reminding surgeons that long-term recurrence and patient selection are important. The present study did not evaluate recurrence beyond 3 months, so it is best interpreted as evidence for short-term recovery rather than long-term superiority.[2,3,4,5,6,11,12,14,15,19]

Several limitations must be acknowledged. The study was conducted in a single centre, limiting external validity. The sample size, although adequate for detecting large differences in pain and stay, may be underpowered for uncommon complications such as significant bleeding, sepsis or incontinence. Follow-up was limited to 3 months, and therefore recurrence, late prolapse, long-term satisfaction and cost-effectiveness could not be evaluated adequately. Treatment allocation was not described as randomised, which introduces potential selection bias.[22,23]

Despite these limitations, the study provides useful institutional evidence. Its strength lies in balanced group sizes, uniform follow-up time points and direct comparison of clinically relevant postoperative outcomes. Future work should include prospective randomisation, longer follow-up, cost-effectiveness analysis, patient-reported outcome measures and comparison with other evolving options such as laser haemorrhoidoplasty and transanal haemorrhoidal dearterialisation.

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The role of conventional surgery should not be understated. Many surgeons continue to regard excisional haemorrhoidectomy as the most definitive operation for advanced prolapsing haemorrhoids, particularly when there is a large external component or when the patient has combined internal and external disease. The present study intentionally excluded Grade IV disease, thrombosed haemorrhoids, fissure, fistula and suspected malignancy. Therefore, its results apply most directly to elective Grade II and Grade III haemorrhoids. Within that defined population, the lower morbidity of MIPH is persuasive. It would be inappropriate, however, to generalize these findings to all haemorrhoidal presentations without considering anatomy and grade.

The pain findings deserve practical emphasis. Pain after haemorrhoid surgery affects mobilization, defecation, oral intake, sleep and willingness to return for follow-up. It may increase the need for opioids or non-steroidal anti-inflammatory drugs and can prolong hospital stay even when no technical complication has occurred. In this dataset, MIPH reduced pain not merely by a small statistical margin but by a clinically obvious difference. At 1 week the mean VAS score in the open group was above 6, whereas the MIPH group was close to 3. This difference would be apparent to the treating surgeon, nursing staff and patient. By 1 month, the MIPH group had near-minimal pain, whereas open haemorrhoidectomy patients still reported more residual discomfort. This supports the view that postoperative pain is the major domain in which stapled haemorrhoidopexy improves early recovery.

Hospital stay is a composite outcome because it reflects pain control, wound condition, confidence with defecation, bleeding, urinary symptoms, mobilization and local institutional discharge practice. A short stay after MIPH may therefore represent cumulative benefit across several aspects of recovery rather than a single isolated mechanism. In a high-volume surgical unit, the ability to reduce admission duration by approximately two days per patient can have institutional value. It improves bed availability and reduces indirect costs for patients and attendants. In private or mixed health-care settings, however, the cost of the stapling device may offset some of these benefits. A formal cost-utility model would be needed to decide whether MIPH is economically dominant in a particular hospital.

Rectal discharge and wound infection are often considered minor compared with bleeding or recurrence, but they matter to patients. Discharge causes anxiety, soiling, local irritation and concern about wound healing. Infection increases antibiotic use, wound care and outpatient visits. The higher early burden after Milligan-Morgan haemorrhoidectomy is not surprising because open haemorrhoidectomy creates wounds in a contaminated field. The important observation is that these events resolved by 1 month, indicating that open haemorrhoidectomy remains safe and eventually effective. The difference lies in early postoperative comfort and care requirement, not in permanent morbidity.

A notable strength of the dataset is the complete absence of anal incontinence in both groups. Continence preservation is essential in any anorectal procedure. The finding suggests that both operative techniques were performed with respect for the sphincter complex and that the procedures, in experienced hands, did not compromise continence. This also helps balance the discussion: while MIPH was superior for pain and short-term wound morbidity, it was not superior in every safety domain because both procedures were equivalent for continence and late bleeding in this cohort.

The most relevant message for clinical practice is that patient selection remains central. MIPH should be offered to patients who are likely to benefit from faster recovery and who can afford the stapling device. Milligan-Morgan haemorrhoidectomy should remain available for patients with unsuitable anatomy, financial constraints or disease characteristics favouring excision. A mature surgical unit should be competent in both operations and should discuss the expected advantages and disadvantages clearly with the patient. The present data can support that counselling by providing locally generated evidence for pain, discharge, infection and hospital stay.

CONCLUSION

In this longitudinal observational cohort of patients with Grade II and Grade III haemorrhoids, MIPH was associated with significantly lower postoperative pain at all follow-up intervals, fewer early wound-related complications and a markedly shorter hospital stay than Milligan-Morgan open haemorrhoidectomy. Postoperative bleeding did not differ significantly, and no anal incontinence was observed in either group. These findings support MIPH as a preferable short-term recovery-oriented procedure for suitable patients when cost, stapler availability and surgical expertise permit. Milligan-Morgan haemorrhoidectomy remains a safe, effective and economical option, particularly where resources are constrained or when disease characteristics favour conventional excisional surgery.

Clinical implications

For appropriately selected patients with Grade II or Grade III haemorrhoids, MIPH should be considered when the clinical priority is lower early pain, earlier discharge and reduced wound-related morbidity. The choice of procedure should still be individualized after considering haemorrhoid grade, external components, surgeon experience, availability of stapling equipment, affordability and patient preference.

Limitations

- Single-centre design limits generalisability.
- Sample size was modest for rare complications.

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- Follow-up was limited to 3 months and does not define long-term recurrence.
- No formal cost-effectiveness, analgesic consumption, return-to-work or quality-of-life analysis was available.
- Non-randomised allocation may have introduced selection bias.

Future scope

- Multicentre randomised trials should validate these findings in diverse populations.
- Long-term follow-up should assess recurrence, residual prolapse and patient satisfaction.
- Cost-effectiveness studies should compare the financial implications of stapling devices against reduced hospitalization and faster recovery.
- Future studies should incorporate validated quality-of-life measures and time to return to work.
- Newer techniques such as laser haemorrhoidoplasty and transanal haemorrhoidal dearterialisation should be compared against both MIPH and open haemorrhoidectomy.

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