Section: General Surgery

Original Research Article

COMPARATIVE STUDY OF POSTOPERATIVE PAIN IN INTERNAL LATERAL ANAL SPHINCTEROTOMY AGAINST MAXIMAL ANAL DILATATION AFTER MILLIGAN-MORGAN HEMORRHOIDECTOMY"-A PROSPECTIVE STUDY

Naveen[1], M. Rajavel[2], Deepak[3], Sampathkumar Poral[4]

[1]Postgraduate, Department of General Surgery, AVMC, Puducherry, India
[2]Professor, Department of General Surgery, AVMC, Puducherry, India.
[3]Assistant Professor, Department of General Surgery AVMC, Puducherry, India
[4]Professor and HOD, Department of General Surgery, AVMC, Puducherry, India

Received : 20/01/2026
Received in revised form : 09/03/2026
Accepted : 31/03/2026

Keywords:
Hemorrhoids; Milligan–Morgan hemorrhoidectomy; lateral internal anal sphincterotomy; maximal anal dilatation; postoperative pain.

Corresponding Author:
Dr. Naveen,
Email: inaveen33.ni@gmail.com

DOI: 10.47009/jamp.2026.8.2.142

Source of Support: Nil,
Conflict of Interest: None declared

Int J Acad Med Pharm
2026; 8 (2); 768-771

ABSTRACT

Background: Excisional hemorrhoidectomy remains the definitive surgical treatment for symptomatic Grade II and III hemorrhoids; however, postoperative pain continues to be its most significant drawback. Internal anal sphincter spasm is a major contributor to this pain. Adjunctive procedures such as lateral internal anal sphincterotomy (LAS) and maximal anal dilatation (MAD) have been employed to reduce sphincter tone, though comparative evidence between these techniques remains limited. The objective of this study was to compare postoperative pain control and recovery outcomes between lateral internal anal sphincterotomy and maximal anal dilatation when used as adjuncts to Milligan–Morgan hemorrhoidectomy. **Materials and Methods**: This prospective comparative study included 60 patients with Grade II and III hemorrhoids, allocated into two groups of 30 patients each. All patients underwent Milligan–Morgan hemorrhoidectomy, with adjunctive LAS in one group and MAD in the other. Postoperative pain was assessed using the Visual Analogue Scale (VAS) at 6, 24, and 48 hours, and on postoperative days 3 and 7. Secondary outcomes included operative time, intraoperative blood loss, requirement for additional analgesia, postoperative complications, fecal continence status, and duration of hospital stay. Statistical analysis was performed using appropriate statistical tests, with $p < 0.05$ considered statistically significant. **Results**: Baseline demographic and clinical characteristics were comparable between the two groups. Postoperative pain scores were significantly lower in the LAS group at 6, 24, and 48 hours, and on postoperative day 3 ($p < 0.001$). Pain scores on postoperative day 7 were low in both groups, with no significant difference. The requirement for additional analgesia was significantly lower in the LAS group (16.7% vs. 46.7%; $p = 0.012$), and the mean duration of hospital stay was significantly shorter ($p = 0.002$). Operative time, intraoperative blood loss, and postoperative complications were comparable, and no patient developed fecal incontinence. **Conclusion**: Lateral internal anal sphincterotomy provides superior early postoperative pain control compared to maximal anal dilatation when used as an adjunct to Milligan–Morgan hemorrhoidectomy, without increasing operative morbidity or compromising continence.

INTRODUCTION

Hemorrhoidal disease is one of the most common benign anorectal disorders encountered in surgical practice and represents a significant cause of morbidity worldwide. The condition results from pathological enlargement and distal displacement of the normal anal cushions and commonly presents with bleeding, prolapse, pain, and discomfort.[1,2] Epidemiological studies suggest that hemorrhoids aaffect a substantial proportion of the adult population, particularly individuals in the third to sixth decades of life.[3]

Excisional hemorrhoidectomy is regarded as the definitive treatment for symptomatic Grade II and Grade III hemorrhoids that fail conservative management, owing to its low recurrence rates and long-term efficacy.[4] Among the various surgical

techniques described, the Milligan–Morgan hemorrhoidectomy remains widely practiced, particularly in tertiary care centers, due to its simplicity, reproducibility, and durable outcomes.[5] Despite its effectiveness, postoperative pain remains the most consistent and distressing complication associated with this procedure and continues to limit patient satisfaction and recovery.[6]

The pathophysiology of post-hemorrhoidectomy pain is multifactorial. Exposure of the richly innervated anoderm, local inflammatory response, edema, and reflex spasm of the internal anal sphincter are considered key contributors.[7] Elevated resting anal canal pressure and impaired anodermal perfusion secondary to internal sphincter spasm have been shown to increase pain, particularly during defecation in the early postoperative period.[8]

Based on this understanding, adjunctive procedures aimed at reducing internal anal sphincter tone have been employed to improve postoperative pain outcomes. Lateral internal anal sphincterotomy has been shown to produce a predictable and sustained reduction in resting anal pressure, thereby reducing postoperative pain and analgesic requirements following surgery.[9,10] However, concerns regarding sphincter division and the potential risk of fecal incontinence have limited its routine application and necessitated careful patient selection.[11]

Maximal anal dilatation, originally described as an alternative means of achieving sphincter relaxation, avoids direct sphincter division and is technically simpler to perform.[12] Nevertheless, outcomes following anal dilatation have been variable, largely due to a lack of standardization of the technique and the transient nature of sphincter relaxation achieved.[13] Reports of temporary continence disturbances have further limited its acceptance as a reliable adjunctive procedure.[14]

Although both lateral internal anal sphincterotomy and maximal anal dilatation have been studied individually as adjuncts to hemorrhoidectomy, direct comparative evidence between these techniques remains limited. Existing studies are heterogeneous in terms of patient selection, hemorrhoid grade, pain assessment tools, and follow-up duration.[15] Furthermore, there is a paucity of data from Indian populations, where dietary habits, healthcare settings, and patient expectations may differ from Western cohorts.

In view of the continued reliance on Milligan–Morgan hemorrhoidectomy for the management of Grade II and III hemorrhoids and the clinical importance of effective postoperative pain control, this study was undertaken to compare lateral internal anal sphincterotomy and maximal anal dilatation as adjuncts to hemorrhoidectomy. The study aimed to evaluate postoperative pain, analgesic requirements, operative parameters, complications, continence outcomes, and duration of hospital stay and to provide evidence to guide surgical decision-making in routine clinical practice.

MATERIALS AND METHODS

Study Design and Setting

This prospective comparative study was conducted at a tertiary care teaching hospital (Aarupadai Veedu Medical College and Hospital, Puducherry) after obtaining approval from the Institutional Ethics Committee. The study was carried out over a predefined period sufficient to achieve the calculated sample size. Written informed consent was obtained from all participants prior to enrolment.

Study Population

Patients diagnosed with Grade II and Grade III hemorrhoids who were planned for surgical management were included in the study. A total of 60 patients meeting the eligibility criteria were enrolled and allocated into two equal groups.

Inclusion Criteria

Adult patients aged ≥18 years

Patients diagnosed with Grade II or Grade III hemorrhoids based on clinical examination

Patients planned for Milligan–Morgan hemorrhoidectomy

Patients willing to provide written informed consent

Exclusion Criteria

Patients with Grade I or Grade IV hemorrhoids

Patients with recurrent hemorrhoids or a history of prior anorectal surgery

Patients with associated anorectal conditions such as fissure, fistula, or abscess

Patients with pre-existing fecal incontinence or neurological disorders affecting continence

Patients unfit for surgery or unwilling to participate

Allocation and Surgical Procedure

Patients were allocated into two groups of 30 each:

LAS group: Patients underwent Milligan–Morgan hemorrhoidectomy with lateral internal anal sphincterotomy.

MAD group: Patients underwent Milligan–Morgan hemorrhoidectomy with maximal anal dilatation.

All surgeries were performed under standardized anesthesia and operative protocols. Milligan–Morgan hemorrhoidectomy was performed in the conventional manner. In the LAS group, a controlled lateral internal anal sphincterotomy was performed following hemorrhoid excision. In the MAD group, maximal anal dilatation was performed using a standardized technique to achieve sphincter relaxation without muscle division.

Outcome Measures

The primary outcome measure was postoperative pain, assessed using the Visual Analogue Scale (VAS). Pain scores were recorded at 6 hours, 24 hours, 48 hours, postoperative day 3, and postoperative day 7.

Secondary Outcome Measures

Operative time (minutes)

Intraoperative blood loss (milliliters)

Requirement for additional postoperative analgesia

Postoperative complications (urinary retention, bleeding, wound complications)

ISSN (O): 2687-5365; ISSN (P): 2753-6556

Fecal continence status
Duration of hospital stay (days)
Postoperative Management and Follow-up
All patients received standardized postoperative care, including routine analgesics and stool softeners. Additional analgesia was administered based on patient requirement and recorded. Patients were monitored for postoperative complications and continence status during hospital stay and follow-up.

Statistical Analysis

Data were entered into a Microsoft Excel spreadsheet and analyzed using JASP version 0.18.3.0 software. Continuous variables were expressed as mean ± standard deviation and compared using the independent samples t-test. Categorical variables were expressed as frequencies and percentages and compared using the Chi-square test or Fisher's exact test, as appropriate. A p-value of <0.05 was considered statistically significant.

RESULTS

There were 30 patients each in the LAS and MAD groups. Baseline demographic and clinical characteristics were comparable between the two groups, with no statistically significant differences in age (44.90 ± 8.95 vs. 40.97 ± 11.02 years; p = 0.135), sex distribution (male: 60.0% vs. 66.7%; p = 0.789), hemorrhoid grade (Grade III: 56.7% vs. 60.0%; p = 1.000), or duration of symptoms (10.80 ± 7.37 vs. 11.53 ± 9.45 months; p = 0.739).

Postoperative pain scores assessed using the Visual Analogue Scale were significantly lower in the LAS group at 6 hours (6.17 ± 0.83 vs. 6.98 ± 0.80; p < 0.001), 24 hours (4.88 ± 0.80 vs. 5.97 ± 0.81; p < 0.001), 48 hours (3.38 ± 0.82 vs. 4.52 ± 0.85; p < 0.001), and POD 3 (2.38 ± 0.59 vs. 3.13 ± 0.71; p < 0.001). The difference at POD 7 was not statistically significant (1.06 ± 0.53 vs. 1.35 ± 0.65; p = 0.064).

Operative time (41.67 ± 5.92 vs. 39.67 ± 4.90 minutes; p = 0.159) and intraoperative blood loss (40.50 ± 9.59 vs. 40.67 ± 6.12 mL; p = 0.936) were comparable between the groups. The requirement for additional postoperative analgesia was significantly lower in the LAS group (16.7% vs. 46.7%; p = 0.012), and the duration of hospital stay was significantly shorter (2.47 ± 0.57 vs. 3.03 ± 0.76 days; p = 0.002).

Postoperative complications were infrequent and comparable between the groups, with no statistically significant differences. No patient in either group developed fecal incontinence.

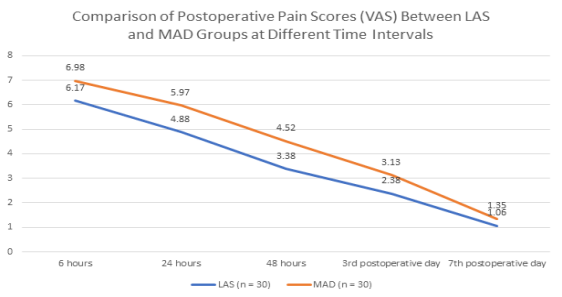

Figure 1: Comparison of Postoperative Pain Scores (VAS) Between LAS and MAD Groups at Different Time Intervals

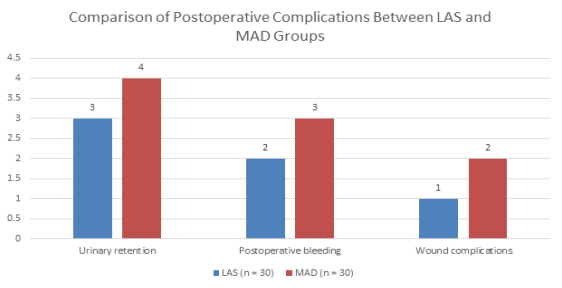

Figure 2. Comparison of Postoperative Complications Between LAS and MAD Groups.

Table 1: Baseline Characteristics of the Study Population

Variable	LAS (n = 30)	MAD (n = 30)	p-value
Age (years), Mean ± SD	44.90 ± 8.95	40.97 ± 11.02	0.135
Male sex, n (%)	18 (60.0)	20 (66.7)	0.789
Hemorrhoid Grade II, n (%)	13 (43.3)	12 (40.0)	1.000
Hemorrhoid Grade III, n (%)	17 (56.7)	18 (60.0)	
Duration of symptoms (months), Mean ± SD	10.80 ± 7.37	11.53 ± 9.45	0.739

Table 2: Comparison of Postoperative Pain Scores (VAS) Between LAS and MAD Groups

Time Interval	LAS (Mean ± SD)	MAD (Mean ± SD)	p-value
6 hours	6.17 ± 0.83	6.98 ± 0.80	0.0003
24 hours	4.88 ± 0.80	5.97 ± 0.81	<0.001
48 hours	3.38 ± 0.82	4.52 ± 0.85	<0.001
POD 3	2.38 ± 0.59	3.13 ± 0.71	<0.001
POD 7	1.06 ± 0.53	1.35 ± 0.65	0.064

Table 3: Operative and Early Postoperative Outcomes

Outcome	LAS (n = 30)	MAD (n = 30)	p-value
Operative time (minutes), Mean ± SD	41.67 ± 5.92	39.67 ± 4.90	0.159
Blood loss (ml), Mean ± SD	40.50 ± 9.59	40.67 ± 6.12	0.936
Additional analgesia required, n (%)	5 (16.7)	14 (46.7)	0.012
Hospital stay (days), Mean ± SD	2.47 ± 0.57	3.03 ± 0.76	0.002

ISSN (O): 2687-5365; ISSN (P): 2753-6556

Table 4: Postoperative Complications and fecal Continence Outcomes

Complication	LAS (n = 30), n (%)	MAD (n = 30), n (%)	p-value
Urinary retention	3 (10.0)	4 (13.3)	1.000
Postoperative bleeding	2 (6.7)	3 (10.0)	1.000
Wound complications	1 (3.3)	2 (6.7)	1.000
Fecal incontinence	0 (0.0)	0 (0.0)	—

DISCUSSION

Postoperative pain remains the principal limitation of excisional hemorrhoidectomy despite its effectiveness in the management of Grade II–III hemorrhoids. In the present prospective study, lateral internal anal sphincterotomy provided superior pain control compared to maximal anal dilatation when used as an adjunct to Milligan–Morgan hemorrhoidectomy.

Baseline demographic and clinical characteristics were comparable between the LAS and MAD groups, enabling a valid comparison of outcomes, as highlighted in previous comparative studies evaluating adjunctive sphincter procedures.[9,10,15] Pain scores were significantly lower in the LAS group during the early and intermediate postoperative periods. At 24 hours, the mean VAS score was 4.88 in the LAS group compared to 5.97 in the MAD group, with this difference remaining significant at 48 hours and POD 3. Similar reductions in early postoperative pain following lateral internal sphincterotomy have been reported by Ho et al. and Khubchandani, who attributed this benefit to sustained reduction in resting anal canal pressure.[9,10]

The physiological basis for improved pain control with LAS is supported by studies demonstrating the role of internal anal sphincter spasm and elevated resting anal pressure in post-hemorrhoidectomy pain.[7,8] In contrast, maximal anal dilatation produces variable and often transient sphincter relaxation, which may explain the higher pain scores observed in the MAD group. Previous studies have also reported inconsistent outcomes with anal dilatation due to lack of standardization of technique.[12,13]

By POD 7, pain scores were low in both groups, with no statistically significant difference, consistent with the natural resolution of postoperative pain described in earlier literature.[6,15] However, the clinically relevant advantage of LAS lies in improved pain control during the early postoperative period, which directly influences patient comfort and recovery.

The requirement for additional postoperative analgesia was significantly lower in the LAS group (16.7%) compared to the MAD group (46.7%), consistent with findings from earlier studies evaluating sphincterotomy as an adjunct to hemorrhoidectomy.[9] Operative time and intraoperative blood loss were comparable between the two groups, indicating that LAS does not impose a significant operative burden, as also reported previously.[10,11]

Postoperative complications were infrequent and comparable between the groups, and no patient developed fecal incontinence. These findings are in agreement with earlier studies demonstrating that limited lateral internal anal sphincterotomy, when performed carefully, does not compromise continence.[11,14] The significantly shorter hospital stay observed in the LAS group further reflects improved postoperative recovery.

CONCLUSION

Lateral internal anal sphincterotomy is a safe and effective adjunct to Milligan–Morgan hemorrhoidectomy for Grade II–III hemorrhoids. It offers superior early postoperative pain control, decreases additional analgesic requirements, and reduces hospital stay without increasing complications or affecting continence. In appropriately selected patients, it may be considered a preferable alternative to maximal anal dilatation.

REFERENCES

1. Thomson WHF. The nature of haemorrhoids. Br J Surg. 1975;62(7):542–552.
2. Loder PB, Kamm MA, Nicholls RJ, Phillips RKS. Haemorrhoids: pathology, pathophysiology and aetiology. Br J Surg. 1994;81(7):946–954.
3. Haas PA, Haas GP, Schmaltz S, Fox TA. The prevalence of haemorrhoids. Dis Colon Rectum. 1983;26(7):435–439.
4. MacRae HM, McLeod RS. Comparison of haemorrhoidal treatment modalities. Dis Colon Rectum. 1995;38(7):687–694.
5. Milligan ETC, Morgan CN, Jones LE, Officer R. Surgical anatomy of the anal canal, and the operative treatment of haemorrhoids. Lancet. 1937;2:1119–1124.
6. Shanmugam V, Thaha MA, Rabindranath KS, Campbell KL, Steele RJC, Loudon MA. Systematic review of randomized trials comparing rubber band ligation with excisional haemorrhoidectomy. Br J Surg. 2005;92(12):1481–1487.
7. Sun WM, Donnelly TC, Read NW. Utility of anal sphincter manometry in assessment of anal pain. Gut. 1990;31(7):743–747.
8. Read NW, Abouzekry L, Read MG. Anal pressures in haemorrhoids. Gut. 1982;23(11):1009–1013.
9. Ho YH, Tan M, Seow-Choen F, Leong AF, Eu KW, Nyam D. Randomized controlled trial of lateral internal sphincterotomy with haemorrhoidectomy. Br J Surg. 1997;84(12):1729–1730.
10. Khubchandani IT. Internal sphincterotomy with haemorrhoidectomy. Dis Colon Rectum. 1982;25(7):644–646.
11. Pernikoff BJ, Eisenstat TE, Rubin RJ, Salvati EP. Reappraisal of partial lateral internal sphincterotomy. Dis Colon Rectum. 1994;37(12):1291–1295.
12. Lord PH. A new regimen for the treatment of haemorrhoids. Proc R Soc Med. 1968;61(9):935–936.
13. Watts JM, Bennett RC, Goligher JC. Stretching of the anal sphincters in treatment of haemorrhoids. Br Med J. 1964;2:342–345.
14. Goligher JC. Surgery of the anus, rectum and colon. 5th ed. London: Baillière Tindall; 1984.
15. Ortiz H, Marzo J, Armendariz P, De Miguel M. Randomized clinical trial of internal sphincterotomy vs no sphincterotomy with haemorrhoidectomy. Br J Surg. 2005;92(3):306–310.

ISSN (O): 2687-5365; ISSN (P): 2753-6556