Comparative Study of Post-Operative Outcomes In Patients Undergoing Open Hemorrhoidectomy With Or Without Lateral Internal Anal Sphincterotomy: A Prospective Analytical Study

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Background: Open hemorrhoidectomy remains the gold standard surgical treatment for Grade III and Grade IV hemorrhoids; however, postoperative pain and related complications continue to affect patient recovery. Lateral internal anal sphincterotomy (LIAS) has been proposed as an adjunctive procedure to reduce sphincter spasm and improve postoperative outcomes. This study compared the effectiveness of open hemorrhoidectomy with and without LIAS.

Methods: A prospective randomized comparative study was conducted among 50 patients with Grade III and Grade IV hemorrhoids. Patients were equally allocated into two groups: Group A underwent conventional open hemorrhoidectomy, while Group B underwent open hemorrhoidectomy with LIAS. Postoperative pain was assessed using the Visual Analogue Scale (VAS) at 24 hours, 48 hours, and postoperative day 7. Secondary outcomes included postoperative bleeding, urinary retention, wound healing, hospital stay, return to routine activities, and postoperative complications.

Results: Patients in the LIAS group had significantly lower VAS pain scores at all follow-up intervals ($p<0.001$). Postoperative bleeding was significantly reduced (8% vs. 24%; $p=0.04$), while wound healing was faster (19.8±3.1 vs. 24.1±3.8 days), hospital stay was shorter (3.2±0.7 vs. 4.7±0.9 days), and return to work was earlier (12.4±2.1 vs. 17.3±2.8 days) compared with conventional hemorrhoidectomy (all $p<0.001$). No permanent fecal incontinence was observed. Overall postoperative outcomes were significantly better in the LIAS group ($p=0.006$).

Conclusion: Addition of lateral internal anal sphincterotomy to conventional open hemorrhoidectomy significantly improves postoperative recovery by reducing pain, bleeding, hospital stay, and recovery time without increasing major complications. LIAS is a safe and effective adjunctive procedure in selected patients with advanced hemorrhoidal disease.

Keywords: Hemorrhoidectomy; Lateral Internal Anal Sphincterotomy; Postoperative Pain; Hemorrhoids; Surgical Outcomes.

I. Introduction

Hemorrhoidal disease is one of the most common benign anorectal disorders encountered in clinical practice and remains a significant cause of morbidity worldwide. It results from pathological enlargement and distal displacement of the normal anal vascular cushions, which play an essential role in maintaining continence.[1] Degeneration of supporting connective tissue, vascular congestion, and increased intra-abdominal pressure contribute to disease development. Patients commonly present with painless rectal bleeding, prolapse, mucous discharge, pruritus ani,

discomfort, and, in advanced cases, severe pain and thrombosis. These symptoms significantly impair quality of life by affecting daily activities, work productivity, and psychological well-being.[2-3]

The global prevalence of hemorrhoidal disease ranges from 4% to 39%, although the actual burden is likely underestimated because many affected individuals remain asymptomatic or avoid seeking medical care. The incidence increases with age and is highest during the fourth to sixth decades of life.[4] Several risk factors, including chronic constipation, prolonged straining, obesity, sedentary lifestyle, pregnancy, prolonged sitting, and low dietary fibre intake, have been associated with disease development.[5] Current evidence suggests that hemorrhoids are multifactorial disorders involving connective tissue degeneration, abnormal vascular regulation, chronic inflammation, and weakening of the suspensory ligament of Parks rather than being solely a consequence of constipation.[6]

The Goligher classification remains the standard system for grading internal hemorrhoids according to the degree of prolapse. Conservative treatment, including dietary modification, increased fibre intake, adequate hydration, stool softeners, flavonoids, and lifestyle changes, is recommended for early-stage disease.[7-8] Office-based procedures such as rubber band ligation, infrared coagulation, and sclerotherapy are effective for selected Grade II and some Grade III hemorrhoids. However, surgical intervention remains the treatment of choice for advanced Grade III and Grade IV hemorrhoids because it provides definitive symptom relief with low recurrence rates.[9]

Open hemorrhoidectomy (Milligan–Morgan technique) continues to be regarded as the gold standard surgical procedure for advanced hemorrhoidal disease owing to its long-term effectiveness and low recurrence. Nevertheless, postoperative pain remains its principal limitation, often resulting in delayed mobilization, prolonged hospital stay, increased analgesic requirements, and delayed return to normal activities.[10-11] Other postoperative complications include urinary retention, bleeding, delayed wound healing, anal stenosis, and, less commonly, anal incontinence. Consequently, several surgical modifications and adjunctive measures have been proposed to reduce postoperative morbidity while maintaining surgical efficacy.[12]

Postoperative pain following hemorrhoidectomy is primarily attributed to internal anal sphincter spasm, tissue edema, inflammation, and surgical trauma to the sensitive anoderm. Persistent sphincter hypertonicity increases resting anal pressure, compromises local blood flow, and delays wound healing. Various interventions, including topical glyceryl trinitrate, calcium channel blockers, botulinum toxin injection, and lateral internal anal sphincterotomy (LIAS), have therefore been investigated to reduce sphincter spasm and improve postoperative recovery.[13]

Lateral internal anal sphincterotomy reduces resting anal pressure by controlled division of the distal internal anal sphincter, thereby improving tissue perfusion and reducing postoperative pain. Several randomized controlled trials have demonstrated lower postoperative pain scores, reduced analgesic requirements, shorter hospital stay, earlier return to work, and decreased postoperative bleeding following hemorrhoidectomy combined with LIAS. However, concerns regarding transient flatus or fecal incontinence have limited its routine use. Recent systematic reviews and randomized studies suggest that although LIAS significantly reduces postoperative pain and anal stenosis, careful patient selection remains essential because of the potential risk of temporary continence disturbances.[14]

Therefore, further prospective comparative studies are required to evaluate the overall benefits and safety of adding lateral internal anal sphincterotomy to conventional open hemorrhoidectomy. The present study was undertaken to compare postoperative pain, bleeding, wound healing, hospital stay, and postoperative complications between patients undergoing open hemorrhoidectomy with and without lateral internal anal sphincterotomy.

II. Methodology

This prospective, randomized, comparative analytical study was undertaken in the Department of General Surgery, Chirayu Medical College and Hospital, Bhopal, Madhya Pradesh for a duration of 10 months after approval from Institutional Ethics Committee. All participants provided written informed consent before to enrolment and the study was carried out in conformity with the ethical principles of the Declaration of Helsinki.

Fifty patients with Grade III or Grade IV internal hemorrhoids as per Goligher classification were included in the study. Patients aged between 18 and 60 years with persistent symptoms despite at least eight weeks of effective conservative management and regarded fit for spinal anaesthesia were eligible for inclusion. Patients with concomitant anorectal diseases (anal fissure, fistula, abscess, or previous anorectal surgery), coagulation disorders, chronic diarrheal diseases, neurological disorders affecting continence, pregnancy, uncontrolled diabetes mellitus, immunosuppression, or other severe systemic illnesses were excluded from the study.

The sample size was calculated by the formula for comparison of two proportions, on the basis of previously published data reporting postoperative pain in 70% of patients undergoing conventional hemorrhoidectomy versus 40% in patients undergoing hemorrhoidectomy with lateral internal anal sphincterotomy. The minimal sample size calculation was 25 patients in each group, total study population of 50 patients with a confidence level of 95%, study power of 80% and α error of 5%.

Patients were randomly assigned to two equal groups using a computer-generated randomization process. Allocation concealment was done by employing sequentially numbered sealed opaque envelopes, opened just prior to operation.

Group A included 25 patients who received conventional open hemorrhoidectomy (Milligan-Morgan procedure) andGroup B included 25 patients who underwent open hemorrhoidectomy with lateral internal anal sphincterotomy. All surgical procedures were performed by consultant surgeons using standardised operative guidelines to minimize inter-operator variability.

All patients were subjected to extensive preoperative evaluation which included complete clinical history, general and local physical examination, digital rectal examination and proctoscopic confirmation of Grade III or Grade IV hemorrhoidal illness. Routine laboratory investigations including complete blood count, renal function tests, blood sugar, coagulation profile, viral indicators, electrocardiography and chest radiography were done as indicated. The Wexner Continence Score was used to determine baseline continence. A bowel prep with a rectal enema was given on the morning before operation, and prophylactic intravenous antibiotics were delivered during induction of anesthesia. Preoperative pain was assessed using the Visual Analogue Scale (VAS).

All procedures were done under spinal anesthesia in patients in the lithotomy position. Conventional open hemorrhoidectomy was performed following the technique of Milligan-Morgan. The hemorrhoidal cushions were found and picked up with artery forceps and dissected in

submucosal plane. They were ligated at the vascular pedicle with absorbable sutures and removed conserving enough mucocutaneous bridges. Wherever needed, hemostasis was achieved by electrocautery.

In patients assigned to Group B, lateral internal anal sphincterotomy was performed immediately after completion of hemorrhoidectomy. The internal anal sphincter was located and separated under direct vision through a tiny left lateral incision of about 0.5–1 cm, transecting the distal one-third to one-half of the internal anal sphincter while preserving the anal mucosa and the external anal sphincter. The sphincterotomy wound was allowed to heal by secondary intention.

All patients were managed with uniform postoperative care postoperatively and received oral non-steroidal anti-inflammatory medications and analgesics according to institutional pain control standards. Stool softeners were prescribed for 2 weeks and patients were instructed to follow a high fiber diet with adequate fluid consumption. Warm sitz baths were prescribed from the first postoperative day and were to be performed two to three times daily. Oral prophylactic antibiotics were given for five days and patients were urged to mobilize early postoperatively.

Postoperative pain was assessed at 24 h, 48 h and 7 days after surgery by Visual Analogue Scale (VAS). Secondary outcome measures were: postoperative bleeding, urinary retention requiring catheterization, wound healing time, length of hospital stay, return to normal daily activities, anal stenosis assessed by clinical examination and postoperative anal continence assessed with the Wexner Continence Score. Patients were followed up at 24 hours, 48 hours, postoperative day seven and thereafter weekly intervals till complete wound healing was attained.

Collected data were imported into Microsoft Excel and analyzed using Statistical Package for the Social Sciences (SPSS) version 24.0. Continuous variables were provided as mean ± SD, and categorical variables were presented as frequencies and percentages. Continuous variables were compared between the two study groups using independent Student's t-test. Categorical variables were compared between the two study groups using the Chi-square test or Fisher's exact test, as appropriate. Statistical significance was declared at $p < 0.05$.

RESULTS

50 patients of Grade III and Grade IV hemorrhoids were enrolled in the study and randomly divided into 2 groups: group A (open hemorrhoidectomy) and group B (open hemorrhoidectomy with lateral internal anal sphincterotomy) with 25 patients in each group. All patients underwent postoperative follow-up. Baseline demographic and clinical parameters were similar between groups. The mean age was 43.2±9.8 years in Group A and 42.6±10.1 years in Group B (p=0.81). The majority of patients were male (64% vs. 68%) and the distribution of Grade III and Grade IV hemorrhoids was similar in both groups, suggesting homogeneity at baseline (Table 1).

Postoperative pain evaluation showed significantly better pain control in individuals undergoing hemorrhoidectomy with lateral internal anal sphincterotomy (Table 2). The mean Visual Analogue Scale (VAS) scores at 24 hours, 48 hours and postoperative day 7 were significantly lower in Group B (4.9 ± 1.0, 3.1 ± 0.8 and 1.1 ± 0.5, respectively) than in Group A (6.8 ± 1.1, 5.1 ± 0.9 and 2.6 ± 0.7, respectively) and all the differences were highly significant ($p<0.001$). Results show that lateral internal anal sphincterotomy gave better postoperative pain reduction during the whole recovery period.

The parameters of postoperative recovery are described in Table 3 . The incidence of postoperative hemorrhage was significantly lower in Group B (8%) than in Group A (24%) (p=0.04). Group B had a lower incidence of urine retention (4% vs. 20% in Group A), but the difference was

not statistically significant (p=0.08). Patients in group B also had significantly faster wound healing (19.8±3.1 vs. 24.1±3.8 days), shorter hospitalization (3.2±0.7 vs. 4.7±0.9 days) and earlier return to work (12.4±2.1 vs. 17.3±2.8 days) than group A (all p<0.001). Group A (8%) had only anal stenosis and 1 patient (4%) in Group B had transitory flatus incontinence, differences which were not statistically significant. There was no case of permanent fecal incontinence and reoperation in both the groups. The overall postoperative results were significantly better in patients who had open hemorrhoidectomy with lateral internal anal sphincterotomy (Group B) than those who had conventional open hemorrhoidectomy (Group A). In Group B, 72% of patients had a great outcome, but in Group A fair and bad outcomes were more common (32% of patients). There was a statistically significant difference in the two groups (p = 0.006) and it has been shown that addition of lateral internal anal sphincterotomy leads to enhanced overall recovery and clinical results.

Table 1. Baseline demographic and clinical characteristics of the study population

Variable		Group A (OH) (n=25)	Group B (OH + LIAS) (n=25)	p-value
Mean age (years)		43.2 ± 9.8	42.6 ± 10.1	0.81
Gender	Male	16 (64%)	17 (68%)	0.76
	Female	9 (36%)	8 (32%)	
hemorrhoids	Grade III	15 (60%)	14 (56%)	0.77
	Grade IV	10 (40%)	11 (44%)	

Table 2. Comparison of postoperative pain scores (VAS)

Follow-up	Group A	Group B	p-value
24 hours	6.8 ± 1.1	4.9 ± 1.0	<0.001
48 hours	5.1 ± 0.9	3.1 ± 0.8	<0.001
Postoperative Day 7	2.6 ± 0.7	1.1 ± 0.5	<0.001

Table 3. Comparison of postoperative outcomes between the two groups

Outcome	Group A (n=25)	Group B (n=25)	p-value
Postoperative bleeding	6 (24%)	2 (8%)	0.04
Urinary retention	5 (20%)	1 (4%)	0.08
Wound healing (days)	24.1 ± 3.8	19.8 ± 3.1	<0.001
Hospital stay (days)	4.7 ± 0.9	3.2 ± 0.7	<0.001
Return to work (days)	17.3 ± 2.8	12.4 ± 2.1	<0.001
Anal stenosis	2 (8%)	0 (0%)	0.14
Temporary flatus incontinence	0	1 (4%)	0.31

III. Discussion

The current prospective comparison study was conducted to evaluate the efficacy of adding lateral internal anal sphincterotomy (LIAS) to traditional open hemorrhoidectomy in patients with Grade III and Grade IV hemorrhoids. In the study, patients who had hemorrhoidectomy performed with LIAS had significantly less pain after surgery, less bleeding after surgery, faster healing of the wound, shorter hospitalization, earlier return to normal activities and better overall postoperative outcome than those who had conventional open hemorrhoidectomy alone. These results suggest that

intraoperative relief of internal anal sphincter spasm improves postoperative recovery without increasing significant morbidity.

For advanced hemorrhoidal illness, open hemorrhoidectomy is still the gold standard treatment, because of its low recurrence rate and good long-term effects. However, its principal restriction is severe postoperative pain which results in delayed ambulation, increased analgesic doses, prolonged hospitalization, and decreased patient satisfaction. The pain is mostly due to spasm of the internal anal sphincter, edema of tissues and wound ischemia. In the present study, patients who underwent hemorrhoidectomy with lateral internal anal sphincterotomy (LIAS) had significantly lower VAS pain scores at 24 hours, 48 hours and postoperative day 7 than those who underwent conventional hemorrhoidectomy alone, which highlights the beneficial role of sphincterotomy in improving postoperative recovery.These results support the idea that controlled division of the distal internal anal sphincter decreases resting anal pressure, increases local tissue perfusion and speeds wound healing, thus lowering postoperative pain. Similar observations were reported by Jin et al. in a systematic review and meta-analysis which showed that therapies to reduce sphincter spasm considerably reduce post-hemorrhoidectomy pain and improve early recovery outcomes.[10]

The results of the present study are in agreement with the prospective randomized comparative study by Alsalaumy, who showed significantly lower postoperative pain scores and lesser postoperative bleeding in patients undergoing open hemorrhoidectomy with LIAS compared to conventional hemorrhoidectomy alone. The author also found faster recovery and better short-term clinical outcomes without increase of surgical complications.[14] In the present investigation, similar outcomes were observed with patients in the LIAS group having lower pain score, considerably shorter duration of hospitalization, faster wound healing and earlier return to usual activities. The above data imply that LIAS is beneficial in reducing postoperative morbidity.Another interesting finding of the present study was the significantly decreased frequency of postoperative bleeding in individuals undergoing hemorrhoidectomy with LIAS . Reduced internal anal sphincter spasm lessens the pressure in the anal canal and the strain on the incision to improve hemostasis and decrease postoperative hemorrhage. These results are in line with recent randomized studies that reported fewer bleeding episodes and better early postoperative healing after hemorrhoidectomy with LIAS compared with conventional hemorrhoidectomy.[14]

The present study also showed considerably less wound healing time and shorter hospital stay duration in LIAS group. Reduction in resting anal pressure following sphincterotomy increases tissue perfusion, lowers wound ischaemia and enhances early epithelialization. Thus, patients feel less postoperative discomfort, use less analgesics and can be discharged faster. These results are consistent with the recommendations of the PROSPECT Working Group which stressed that therapies lowering sphincter spasm are correlated with enhanced postoperative recovery and patient satisfaction after hemorrhoid surgery.[11] Despite these promising results, the routine application of LIAS during hemorrhoidectomy remains contentious. Abdelrahman et al. performed a randomized controlled trial and did not find any meaningful reduction in postoperative pain after LIAS, with a higher rate of temporary anal incontinence.[15] The difference between their and our results can be attributed to changes in the design of the studies, size of the sample, selection of patients, surgical expertise, degree of sphincter division, postoperative analgesia protocols, and methods of assessing continence. In the present study we had one transitory flatus incontinence and no persistent fecal

incontinence, which demonstrates that the use of meticulous surgical technique, and proper patient selection, can limit this problem.

The present study indicated considerably superior overall postoperative results in individuals receiving hemorrhoidectomy with LIAS. Almost three-quarters of patients in the LIAS group had excellent outcomes compared with one-third getting traditional hemorrhoidectomy. This improvement is associated with less post-operative pain, decreased bleeding rates, faster wound healing and earlier mobilization. Similar results were observed by Emile et al who concluded that supplementary methods for reduction of internal anal sphincter spasm considerably improve the postoperative recovery and reduce the postoperative morbidity.[4] Patients who had LIAS also had considerably faster wound healing and shorter hospital stay. Recovery is facilitated by lowering resting anal canal pressure, which increases tissue perfusion and promotes early epithelialization. This is in accordance with the study by Pescatori et al who found improved wound healing and less postoperative discomfort after interventions aimed at reducing sphincter hypertonicity.[16] In addition, patients in the LIAS group resumed normal activities significantly earlier than those who underwent conventional hemorrhoidectomy, in agreement with the findings of Brown et al., who showed that effective postoperative analgesia results in faster functional recovery and increased patient satisfaction.[17]

No lasting fecal incontinence was seen, however one patient in the LIAS group exhibited temporary flatus incontinence. Similar data are described by Perera et al. and they state that transitory continence difficulties after LIAS are usually self-limiting and rare when the treatment is conducted correctly.[18] Moreover, current clinical guidelines advocate selective rather than routine use of LIAS and stress the importance of cautious patient selection and surgical expertise to maximize benefits and minimize risk of continence damage.[1] Emerging data further support the use of LIAS on a customized basis, with reduced postoperative pain, wound healing, and recovery and a low rate of problems.[2] The strengths of the present study include its prospective design, standardized surgical method and extensive evaluation of postoperative outcomes. However, the relatively small sample size, single-center design and short follow-up time limit the generalizability of the findings. Larger multicenter studies with longer follow-up are warranted to establish the long-term safety and efficacy of LIAS.

IV. Conclusion

Addition of lateral internal anal sphincterotomy to conventional open hemorrhoidectomy significantly reduced postoperative pain and bleeding, promoted faster wound healing, shortened hospital stay, and facilitated earlier return to daily activities without increasing major complications. LIAS appears to be a safe and effective adjunct for selected patients with advanced hemorrhoidal disease.

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