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The Effect of Lateral Internal Sphincterotomy During Hemorrhoidectomy: A Randomized Clinical Trial

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ABSTRACT

Background: Hemorrhoidectomy is the standard treatment for high grades of hemorrhoids, but is often associated with severe postoperative pain due to internal anal sphincter (IAS) spasm. This study evaluates the effect of partial lateral internal sphincterotomy (PLIS) on the outcomes.

Methods: One hundred patients with grade II-IV hemorrhoids were randomly allocated into two groups: Group A underwent conventional hemorrhoidectomy alone (n=50), and Group B underwent hemorrhoidectomy with PLIS (n=50). Patients were followed for 6 weeks postoperatively.

Results: The mean age was 41.65±8.7 years in Group A and 41.5±9.2 years in Group B (p=0.93). Postoperative pain was significantly lower in Group B (30%) compared to Group A (74%) (p<0.001). Mean hospital stay was shorter in Group B (1.5±0.5 days) versus Group A (1.9±0.7 days) (p=0.001). Wound healing was significantly faster in Group B (29.6±2.65 days) compared to Group A (44.9±3.5 days) (p<0.001). Postoperative bleeding occurred in 4% of Group A and 8% of Group B (p=0.68). Anal stenosis occurred in 2% of Group A with no cases in Group B (p=1.00). No significant difference was noted in infection rates (10% vs 16%, p=0.37). No incontinence was reported in either group.

Conclusion: PLIS combined with hemorrhoidectomy significantly reduces postoperative pain, shortens hospital stay, and enhances wound healing without increasing major complications.

Keywords: hemorrhoidectomy, lateral internal sphincterotomy, postoperative pain, wound healing

INTRODUCTION

Hemorrhoids, which afflict 4.4% to 36.4% of the general population, are dilated submucosal vascular anal cushions that are typically found in the anal canal at the 3, 7, and 11 o'clock positions (1). The peak incidence occurs in individuals aged 45-65 years (2). For grade III and IV hemorrhoids, conventional hemorrhoidectomy is still the preferred surgical procedure (3).

The main drawback of hemorrhoidectomy is excruciating pain during the first week following the procedure. This pain is caused by internal anal sphincter (IAS) spasm, which is revealed following an open hemorrhoidectomy, especially in younger patients with higher anal tone (4).

Partial lateral internal sphincterotomy (PLIS) reduces anal pressure, lessens

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IAS spasm, and interrupts the pain-spasm cycle responsible for postoperative pain, while also promoting wound healing (5).

This randomized controlled trial was designed to evaluate the effectiveness of PLIS on postoperative pain, healing, and complications, compared with hemorrhoidectomy alone.

PATIENTS AND METHODS

Study Design and Setting

From December 2023 to December 2024, the General Surgery Department of Assiut University Hospital hosted this prospective randomized controlled trial. The study was approved by the Clinical Research Ethics Committee and the Medical Research Ethics Committee, Faculty of Medicine, Assiut University. Written informed consent was obtained from every participant.

Patient Selection

Inclusion criteria were: surgically fit patients according to ASA classification, hemorrhoids grade II-IV, and age 18-60 years. Exclusion criteria were: surgically unfit patients, grade I hemorrhoids, secondary hemorrhoids, anal incontinence, and debilitating disease or immunosuppression.

Sample Size and Randomization

The randomization sequence was generated using computer-generated random number tables by a statistician who was not involved in patient recruitment or outcome assessment. Allocation concealment was maintained using opaque sealed envelopes, which were opened by an independent nurse immediately before surgery to ensure that group allocation could not be anticipated in advance.

Group A (n=50) underwent conventional hemorrhoidectomy alone, while Group B (n=50) underwent hemorrhoidectomy with PLIS. All patients were blinded to group allocation.

Surgical Technique

All patients received standard preoperative preparation including two enemas, 6-hour fasting, prophylactic antibiotics (2g IV third-generation cephalosporin and 500mg metronidazole), and bladder emptying.

Group A underwent conventional Milligan-Morgan hemorrhoidectomy, with dissection using electrocautery and transfixation ligation of the pedicle, preserving skin bridges.

Group B underwent standard hemorrhoidectomy plus PLIS, performed during dissection of the pile at the 3 o'clock position, using dissecting scissors to create a snip in the lower IAS not exceeding 0.5 cm in depth.

Postoperative Assessment

Patients were followed for 6 weeks. Pain was assessed using the Visual Analogue Scale (VAS) at 24 hours and on postoperative days 3 and 7, and again at the 2-week and 6-week follow-up visits, and was classified as mild (1-3), moderate (4-7), or severe (>7) based on the highest recorded score during follow-up. Analgesic requirement, including the number and type of analgesic doses (including opioids), was recorded for each patient as an additional indicator of pain severity. Other outcomes included bleeding, infection, anal stenosis, incontinence, hospital stay, and wound healing time. The follow-up period extended to 8 weeks for patients who did not have complete wound healing or had other complaints.

Statistical Analysis

Statistical analysis was performed using SPSS software, version 26 (IBM Corp., Armonk, NY, USA). Continuous variables were expressed as mean ± standard deviation and compared between the two groups using the independent samples t-test. Categorical variables were expressed as numbers and percentages and compared using the chi-square test or Fisher's exact test, as appropriate. A p-value of less than 0.05 was considered statistically significant.

RESULTS

One hundred patients were enrolled, with 50 patients in each group. The demographic and clinical characteristics were comparable between groups (*tables 1-3*).

Postoperative Outcomes

Moderate to severe postoperative pain was significantly lower in Group B (30%) compared with Group A (74%) ($p<0.001$). In Group A, 34% of patients reported severe pain requiring more than three doses of opioids, compared with 14% in Group B (*table 4*).

Postoperative bleeding occurred in 2 patients (4%)

Table 1 - Demographic data of studied patients

Parameter	Group A (n=50)	Group B (n=50)	P-value
Age (years), mean ± SD	41.65 ± 8.7	41.5 ± 9.2	0.93
Male, n (%)	32 (64%)	28 (56%)	0.41
Female, n (%)	18 (36%)	22 (44%)	0.41

Table 2 - Medical history of studied patients

Comorbidity	Group A, n (%)	Group B, n (%)	P-value
Hypertension	10 (20%)	13 (26%)	0.48
Diabetes mellitus	8 (16%)	10 (20%)	0.61
Ischemic heart disease	3 (6%)	1 (2%)	0.31

Table 3 - Clinical presentation of studied patients

Presentation	Group A, n (%)	Group B, n (%)	P-value
Anal bleeding	20 (40%)	22 (44%)	0.68
Anal discomfort	35 (70%)	32 (64%)	0.51
Anal discharge	11 (22%)	8 (16%)	0.44

Table 4 - Postoperative outcomes of studied patients

Outcome	Group A	Group B	P-value
Postoperative pain (Moderate to severe), n (%)	37 (74%)	15 (30%)	<0.001
Postoperative bleeding, n (%)	2 (4%)	4 (8%)	0.68
Anal stenosis, n (%)	1 (2%)	0 (0%)	1.00
Postoperative infection, n (%)	5 (10%)	8 (16%)	0.37
Hospital stay (days), mean ± SD	1.9 ± 0.7	1.5 ± 0.5	0.001
Wound healing (days), mean ± SD	44.9 ± 3.5	29.6 ± 2.65	<0.001a

in Group A (both secondary bleeding) and in 4 patients (8%) in Group B (2 primary, 2 secondary), with no significant difference between groups (p=0.68). All bleeding episodes were mild and managed conservatively.

One patient (2%) in Group A developed anal stenosis at 5 weeks, which responded to Hegar dilator dilatation. No cases of anal stenosis occurred in Group B (p=1.00).

Postoperative infection occurred in 5 patients (10%) in Group A and 8 patients (16%) in Group B (p=0.37). All infections were mild to moderate and were managed conservatively.

Mean hospital stay was significantly shorter in Group B (1.5±0.5 days) compared with Group A (1.9±0.7 days) (p=0.001), primarily due to reduced analgesic requirements.

Wound healing was significantly faster in Group B (29.6±2.65 days) compared with Group A (44.9 ± 3.5 days) (p<0.001). No anal incontinence was reported in either group during follow-up.

DISCUSSION

TThis randomized controlled trial suggests that the addition of PLIS to conventional hemorrhoidectomy may improve postoperative outcomes, particularly in terms of pain reduction, shorter hospital stay, and faster wound healing.

The most important finding in this study is the significant reduction in moderate to severe post-operative pain in the PLIS group (30% vs 74%, p<0.001). This may be explained by the reduction in IAS tone, which helps to break the pain-spasm cycle commonly observed after hemorrhoidectomy. Similar findings have been reported in previous studies, such as those by Yaqoup et al., Al-Gadaa, and Memon et al., who demonstrated lower pain scores in patients undergoing combined procedures (6-8).

However, Khubchandani found no statistically significant difference in postoperative pain following the addition of a sphincterotomy, which runs counter to our findings (9).

The shorter hospital stay observed in the PLIS group (1.5±0.5 vs 1.9±0.7 days, p=0.001) is likely a direct consequence of reduced postoperative pain and decreased need for strong analgesics. This finding is consistent with studies by Galizia et al. and Yadaw et al., which also reported earlier discharge in patients undergoing sphincterotomy (10,11).

Yadaw et al. demonstrated decreased post-operative pain, enhanced quality of life, and shorter hospital stays. Furthermore, the addition of lateral internal sphincterotomy only slightly increased the overall surgical time (11).

Wound healing was significantly faster in the PLIS group (29.6±2.65 vs 44.9±3.5 days, p<0.001), which may be attributed to improved anodermic blood flow following reduction of sphincter pressure. This supports the physiological role of sphincterotomy in enhancing tissue perfusion and promoting healing.

Meenakshi et al. also reported that hemorrhoidectomy combined with PLIS facilitates more rapid wound healing and enhances patient recovery (12).

Regarding complications, no statistically significant differences were observed between the two groups in terms of bleeding and infection. Although bleeding was slightly more frequent in the PLIS group, all cases were mild and managed conservatively. Interestingly, anal stenosis occurred only in one case (2%) in the hemorrhoidectomy-only group, with no cases in the PLIS group, suggesting that reducing sphincter spasm may have a protective effect against stenosis. This is consistent with Galizia et al., who reported post-operative anal stenosis requiring early dilation in 4 patients (18.1%) in the hemorrhoidectomy-only group, with no cases in the PLIS group (10).

Importantly, no cases of anal incontinence were reported in this study. This may be attributed to the limited extent of sphincterotomy (≤0.5 cm) and careful surgical technique. This finding differs from some studies reporting transient incontinence, mainly to flatus (ranging from 4.7% to 17%), which may be related to more extensive sphincter division (10,13,14).

This study has certain limitations. First, the follow-up period was limited to 6 weeks, which may not be sufficient to detect late complications such as recurrence or delayed onset incontinence; longer-term follow-up is recommended in future studies. Second, this was a single-center study with a relatively modest sample size, which may limit the generalizability of these findings and reduce the power to detect differences in less common complications such as bleeding and infection. Third, objective functional assessment of the internal anal sphincter using anorectal manometry was not performed; reliance on clinical assessment and the VAS-based pain scale alone may not fully capture changes in sphincter function before and after surgery. Future multicenter studies with longer follow-up and pre and postoperative anorectal manometry are recommended to confirm and extend these findings.

CONCLUSION

In this study, combining PLIS with conventional hemorrhoidectomy was associated with a significant reduction in postoperative pain and faster wound healing, without an increase in major complications, suggesting that it is a safe and feasible adjunct to conventional hemorrhoidectomy. The short follow-up duration and small sample size restrict the statistical power of the analysis. These limitations prevent definitive conclusions about late-onset or rare adverse events, specifically the incidence and severity of long-term anal incontinence. Future studies require extended observation periods and larger, multicenter cohorts to properly assess these risks.

Conflicts of Interest

The authors declare that there is no conflict of interest.

Financial Disclosures: none

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