

ORIGINAL ARTICLE

A Comparative Study Between Laser Hemorrhoidoplasty and Open Hemorrhoidectomy

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ABSTRACT

Introduction: Hemorrhoids are a common benign anorectal disorder that significantly impacts quality of life. While open hemorrhoidectomy (OH) is considered the gold standard for advanced hemorrhoids, it is associated with severe postoperative pain and prolonged recovery. Laser hemorrhoidoplasty (LHP) is a minimally invasive alternative that ablates hemorrhoidal tissue with laser energy, aiming to reduce morbidity.

Aim: To compare the outcomes of LHP and OH in terms of operative time, postoperative pain, hospital stay, complications, and recurrence.

Methods: This prospective comparative study was conducted over 12 months in the Department of Surgery. Patients with Grade II-III-IV hemorrhoids were randomized into two groups: Laser Hemorrhoidoplasty Group (LHPG, n=30) and Open Hemorrhoidectomy Group (OHG, n=30). Data on operative time, pain (VAS score), hospital stay, complications, and recurrence were collected and analyzed using SPSS v26.

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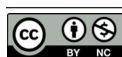
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Results: LHP demonstrated shorter operative time (25.6 ± 3.8 min vs. 38.7 ± 5.2 min), lower VAS pain scores at 12, 24, and 48 hours, and reduced hospital stay. Complication rates were lower in LHPG, with reduced bleeding and constipation compared to OHG. Recurrence rates at 3 months were comparable between the groups.

Conclusion: Laser hemorrhoidoplasty is a safe, minimally invasive alternative to open hemorrhoidectomy, offering significant advantages in terms of pain reduction, faster recovery, and fewer complications, though cost and availability remain limiting factors.

KEYWORDS

- Hemorrhoids • Laser Hemorrhoidoplasty • Open Hemorrhoidectomy
- Minimally Invasive Surgery • Postoperative Pain

INTRODUCTION

Hemorrhoidal disease is one of the most common benign anorectal conditions, affecting 2.9%–27.9% of the global population and significantly impairing quality of life.^{1,2} It is characterized by symptomatic enlargement and distal displacement of the normal anal cushions.³ Internal hemorrhoids are typically classified into four grades (I–IV) based on the degree of prolapse, with surgical intervention being necessary in advanced stages (Grades III and IV).^{4,5}

Open hemorrhoidectomy (OH), as first described by Milligan and Morgan (1937) and later modified by Ferguson, has long been considered the gold standard for advanced hemorrhoids.^{6,7} While OH provides excellent long-term results, it is associated with considerable postoperative pain, delayed wound healing, urinary retention, and complications such as anal stricture.^{8,9}

In recent decades, minimally invasive approaches have gained popularity. Laser Hemorrhoidoplasty (LHP) was introduced as a sphincter- and mucosa-preserving alternative that employs diode laser energy to coagulate hemorrhoidal tissue, leading to shrinkage and fibrosis without excision.^{10,11} By preserving the anoderm and reducing tissue trauma, LHP has been shown to result in less pain, faster recovery, and fewer complications compared with OH.^{12–14}

Several clinical studies and meta-analyses have compared LHP with OH, highlighting advantages in terms of operative time, reduced

blood loss, shorter hospital stay, and improved postoperative comfort.^{15–17} However, questions remain regarding the long-term recurrence rate and the higher cost associated with laser technology.¹⁸

This study was therefore undertaken to provide a prospective comparative evaluation of Laser Hemorrhoidoplasty and Open Hemorrhoidectomy, focusing on operative parameters, postoperative pain, complications, hospital stay, and recurrence.

Aim

To compare the efficacy of Laser Hemorrhoidoplasty and Open Hemorrhoidectomy in patients with Grade II–III–IV hemorrhoids.

METHODOLOGY

Study Design:

Prospective hospital-based comparative study conducted from September 2024 to August 2025 in the Department of Surgery.

Study Population:

- Inclusion criteria: Patients ≥ 18 years, Grade II–III–IV hemorrhoids, fit for surgery.
- Exclusion criteria: Grade I hemorrhoids, bleeding disorders, anorectal infections, unwilling patients.

Sample Size: 60 patients divided equally:

- Laser Hemorrhoidoplasty Group (LHPG): 30 patients.
- Open Hemorrhoidectomy Group (OHG): 30 patients.

Procedure:

- LHP: Performed under spinal anesthesia using a diode laser probe (1470 nm). Laser energy was delivered submucosally into hemorrhoidal tissue until shrinkage occurred.
- OH: Standard Milligan-Morgan excisional hemorrhoidectomy with electrocautery.

Data Collection:

- Operative time (minutes)
- Postoperative pain (VAS at 12, 24, 48 hours)
- Hospital stay (days)
- Complications (bleeding, infection, constipation, stricture, prolapse)
- Recurrence at 1, 2, 3 months

Statistical Analysis:

Data was analysed using SPSS version 26. Continuous variables expressed as mean $\pm$ Standard deviation and categorical variables as percentages. Independent T-test were used for continuous comparing variables while chi-square test used for categorical variable. A p-value < 0.05 was considered statistically significant.

RESULTS

Table 1: Patient Demographics

Distribution of Laser Hemorrhoidoplasty group (LHPG) and Open Hemorrhoidectomy group (OHG) according to age and gender.

A. Age distribution of patient

Age Group (Years)	LHPG (n=30)	OHG (n=30)	p-value
18-30	3 (10%)	2 (6.9%)	0.72
31-45	9 (30%)	8 (26.7%)	0.65
46-60	13 (43.3%)	14 (46.7%)	0.59
>60	5 (16.7%)	6 (20%)	0.81
Mean SD	45.1 $\pm$ 8.2	44.7 $\pm$ 8.5	0.72

This table shows the age distribution of patients in the Laser haemorrhoidoplasty group (LHPG) and open hemorrhoidectomy groups (OHG). The majority of patients in both groups fall in the 46-60 age range. No statistically significant difference is observed between the two groups ($p > 0.05$) ensuring comparability.

B. Gender distribution of Patients

Gender	LHPG (n=30)	OHG (n=30)	p-value
Male	23 (76.7%)	22 (73.3%)	0.36
Female	7 (23.3%)	8 (26.7%)	0.36
Male: Female Ratio	3.3:1	2.75:1	0.36

This table outlines the gender distribution in both groups. The proportion of male patients is higher in both LHP and OH groups, with no statistically significant difference ($p > 0.05$), indicating that gender was not a confounding factor in study.

Table 2: Operative Parameters

Distribution of open hemorrhoidectomy (OH) group and laser hemorrhoidoplasty (LHP) group according to their Days of Hospital Stay (DOHS) and Operative Time

Days of Hospital Stay	LHPG (n=30)	OHG (n=30)	p-value
0-1 days	5 (16.7%)	2 (6.7%)	0.05
1-2 days	23 (76.7%)	17 (56.7%)	0.03
>2 days	2 (6.6%)	11 (36.6%)	0.02

Parameter	LHPG (Mean SD)	OHG (Mean SD)	p-value
Operative Time (Mins)	25.6 $\pm$ 3.8	38.7 $\pm$ 5.2	<0.001

Table 2 shows hospital stay duration between LHPG and OHG groups. A significantly higher percentage of OHG patients required hospitalisation for more than 2 days [36.6% vs. 6.6%], while more LHPG patients were discharged within 1-2 days. LHPG demonstrated significantly less operative time [25.6 $\pm$ 3.8 minimum vs. 38.7 $\pm$ 5.2] compared to OHG. The p-value indicate a statistically significant difference in hospital stay duration, favoring LHPG.

Table 3: Post-operative Pain (VAS Scores)

Distribution of open hemorrhoidectomy (OH) group and laser hemorrhoidoplasty (LHP) group according to VAS pain score

Time Point	LHPG (Mean SD)	OHG (Mean SD)	P-value
12 hours	3.8 $\pm$ 0.5	6.2 $\pm$ 0.6	<0.001
24 hours	2.6 $\pm$ 0.4	5.0 $\pm$ 0.7	<0.001
48 hours	1.7 $\pm$ 0.3	3.9 $\pm$ 0.6	<0.001

Table 3 shows Laser Hemorrhoidoplasty [LHPG] resulted in significantly less pain levels at 12, 24 and 48 hours postoperatively compared to the Open Hemorrhoidectomy [OH] group.

The difference in statistically significant ($p < 0.001$), confirming that LHPG is less painful than OHG.

Table 4: post-operative Complications

Distribution of open hemorrhoidectomy (OH) group and laser hemorrhoidoplasty group according to their clinical feature

Complications	LHPG (n=30)	OHG (n=30)	p-value
Bleeding	1 (3.3%)	2(6.7%)	0.04
Infection	1(3.3%)	2(6.7%)	0.08
Anal Stricture	0 (0%)	1(3.3%)	--
Constipation	2 (6.7%)	6 (20%)	0.03
Prolapse	1 (3.3%)	1 (3.3%)	0.30

Table 4 compares post operative complications between laser hemorrhoidoplasty [LHPG] and open hemorrhoidectomy [OHG]. LHPG showed lower rates of bleeding (3.3% vs. 6.7%), constipation (6.7% vs. 20%), infection (3.3% vs. 6.7%) and anal stricture (0% vs. 3.3%) compared to OHG. However similar outcomes were seen with prolapse in both groups. These finding suggests that LHPG is associated with fewer post operatively complications and better recovery profile.

Table 5: Recurrence Rates

Distribution of open hemorrhoidectomy (OH) group and laser hemorrhoidoplasty (LHP) group according to their recurrence rates

Follow-Up Period	LHPG (%)	OHG (%)	p-value
7 days	0 (0%)	0 (0%)	—
15 days	0 (0%)	2 (6.7%)	0.04
1 Month	0 (0%)	3 (10%)	0.03
2 Months	1 (3.3%)	4 (13.3%)	0.04
3 Months	1 (3.3%)	6 (20%)	0.01

Table 5 presents recurrence of hemorrhoids between laser hemorrhoidoplasty[LHPG] and open hemorrhoidectomy[OHG] over a 3 months follow-up. Both groups have no recurrence at 7 days,. At 15 days, 1, 2, and 3 months, high recurrence was noted only in OHG (p -value < 0.05). This finding suggests laser hemorrhoidoplast [LHPG] is associated with significantly lower short term recurrence rate as compared to open hemorrhoidectomy [OHG].

DISCUSSION

This study confirms that Laser Hemorrhoidoplasty [LHPG] offers superior

short-term outcomes compared to open hemorrhoidectomy [OHG].

LHP patients had shorter operative times, less post operative pain, reduced hospital stays, and fewer complications(such as bleeding, infection, anal stricture and constipation) consistent with previous studies on minimally invasive approaches.

However, drawbacks of LHPG include higher procedural cost, requirement for laser equipment, and specialized training of surgeons.

Comparison with Open Hemorrhoidectomy: Open Hemorrhoidectomy, while effective, remains associated with significant postoperative pain, longer recovery periods, and complications such as anal stricture. However, it is more cost-effective and universally available, making it a viable option for resource-limited settings.

CONCLUSION

Laser hemorrhoidoplasty is a safe and minimally invasive technique that significantly reduces pain, hospital stay, recurrence rate and complications compared to open hemorrhoidectomy. Therefore LHP should be preferred in centers where expertise and resources are available. Open hemorrhoidectomy, however, remains a valuable option in low-resource settings.

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