ORIGINAL ARTICLE https://doi.org/10.3126/njms.v11i1.91520

Effectiveness of Laser Hemorrhoidoplasty in the Treatment of Hemorrhoidal Disease in Western Nepal: A Ambispective Descriptive study

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Received: November 18, 2025 **Accepted: January 5, 2026** **Published: January 31, 2026**

Cite this paper: Timilsina BD, Timilsina BS. Effectiveness of Laser Hemorrhoidoplasty in the Treatment of Hemorrhoidal Disease in Western Nepal: A Ambispective Descriptive study. *Nepal Journal of Medical Sciences.* 2026;11(1):21:57-68. https://doi.org/10.3126/njms.v11i1.91520

ABSTRACT

Introduction: Hemorrhoidal disease is a common anorectal condition causing pain, bleeding, and discomfort. Conventional hemorrhoidectomy, although effective, is associated with significant postoperative pain and delayed recovery. Laser hemorrhoidoplasty (LHP) has emerged as a minimally invasive alternative that aims to reduce morbidity while ensuring effective treatment. This study evaluated the short- and long-term effectiveness of LHP in patients with Grade II-IV hemorrhoids.

Methods: A total of 96 patients who underwent LHP at Manipal College of Medical Sciences (MCOMS), Pokhara between 1st July 2023 to 30th June 2024 were included in the study following ethical approval from institutional review board of MCOMS using convenience sampling. Retrospective data were obtained from hospital records, while prospective follow-up involved verbal and written informed consent. Long-term outcomes, including bleeding, recurrence, incontinence, anal stenosis, perianal fistula, and fissure, were assessed via follow-up and medical records.

Results: Of 96 patients, 65 (67.7%) were male and 31 (32.3%) were female. Grade III hemorrhoids were most common (61.5%), followed by Grade II (25.0%) and Grade IV (13.5%). Mean operative duration was 19.72 ± 3.19 minutes with minimal blood loss 9.8 ± 3.4 ml. Postoperative bleeding and submucosal edema were more frequent in higher-grade hemorrhoids ($p<0.001$).

Conclusions: LHP is a safe and effective minimally invasive treatment for symptomatic hemorrhoids, providing rapid pain relief, minimal intraoperative blood loss, and quick return to daily activities. While short- and long-term outcomes are favorable for Grade II and III hemorrhoids, Grade IV patients require closer monitoring due to higher complication rates.

Key words: *Hemorrhoids, Laser, Long term, Short term, Outcome.*

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INTRODUCTION

Hemorrhoids are the common cause of benign anorectal symptoms. [1] The prevalence of symptomatic hemorrhoids affecting quality of life (QOL) in adult is 38.9%. [2] These individuals not only seek the surgical management but also rely on over-the-counter medications. [1,3] Treatment of hemorrhoids depends on patient factors and grading. [4,5] Surgery is usually indicated after failure of conservative measures or for higher grades (III and IV). Hemorrhoidal disease (HD) treatment choice is still remains controversial. [6]

The patient and the surgeon seek a procedure that offers a good outcome with less morbidity. Though in this 21st century, open hemorrhoidectomy described by Milligan-Morgan, is regarded as the gold standard treatment is often associated with significant postoperative pain and complications. [7] Later various alternative techniques like Ferguson hemorrhoidectomy, rubber-band ligation, and stapled haemorrhoidopexy have been developed to reduce these drawbacks, but most still carry risks such as bleeding, recurrence, or sepsis. [8,9,10]

Recently, non-excisional laser haemorrhoidoplasty has gained popularity as a minimally invasive option with fewer complications and better patient comfort. [11,12] However, in developing countries like ours, studies evaluating this technique are scarce. Therefore, we conducted this exploratory study to assess the short-term and long-term effectiveness of laser haemorrhoidoplasty in the management of hemorrhoidal disease.

METHODS

This was the hospital based retrospective descriptive study with prospective follow-up (ambispective study) carried out in the Department of General Surgery at Manipal College of Medical Sciences, Pokhara following approval from the Institutional Review Board (MCOMS/IRC/696).

A convenience sampling technique was used. The sample size was calculated using the formula n= $Z^2p(1-p) / d^2$. Given the confidence level (z) at 95% is 1.96; prevalence of symptomatic hemorrhoid is 4.4%.[13] So the estimated proportion (p)= 0.044, margin of error d= 0.05. Based on those parameters the estimated sample size was 65. All eligible

patient (consecutive sampling) were underwent laser haemorrhoidoplasty under spinal anesthesia in the lithotomy position using a conical fiber and a 1479-nm diode laser at 8 W under proctoscopic guidance, resulting in controlled coagulation and shrinkage of the haemorrhoidal tissue) at MCOMS between the period of 1st July 2023 to 30th June 2024 were enrolled in the study i.e. n= 96 patients ensuring comprehensive coverage and minimizing selection bias.

For the retrospective component, data were obtained from hospital records. As these were existing records with no direct patient contact, a waiver of informed consent was requested and approved by the Institutional Review Board. Patient confidentiality was strictly maintained by anonymizing data before analysis. For the prospective component (long-term follow-up), patients were contacted via telephone or invited for hospital visits. Verbal informed consent was obtained prior to administering questionnaires by phone, and written informed consent was obtained from those attending follow-up visits.

Data collection was based on patients who met the inclusion criteria. Patients with a history of anal surgery, anal carcinoma, sphincter dysfunction, anal incontinence, age below 18, grade I or complicated hemorrhoids, patients having incomplete records or those unwilling to participate were excluded.

Patients were categorized into three age groups (≤30 years, 31–49 years, and ≥50 years) to facilitate subgroup analysis and allow comparison of outcomes across younger, middle-aged, and older adults rather than predefined epidemiological cut-offs. Postoperative pain scores were obtained from medical records for in-person visits, or by telephone contact when patients did not attend the scheduled 14-day follow-up. Those reporting persistent pain were scheduled for an additional 1-week follow-up, either in person or via telephone, to monitor pain resolution and recovery. Pain was recorded using the Visual Analog Scale (VAS). For telephone follow-up, the equivalent Numerical Rating Scale (NRS, 0–10) was used for verbal assessment. Short-term outcomes, including post-operative pain, bleeding, infection, and time to return to normal daily activities, were obtained from hospital records for the immediate post-operative period. Long-term outcomes (after one year of hemorrhoidoplasty)

including bleeding, hemorrhoid recurrence, anal stenosis, perianal fistula and fissure were collected by contacting patients via telephone or inviting them for follow-up visits, supplemented by medical records if any re-interventions had occurred. This approach allowed assessment of both early post-operative outcomes and long-term effectiveness of laser haemorrhoidoplasty.

Data analysis was performed using SPSS version 22.0. Chi-square test and Fisher's exact test were employed to assess associations between categorical variables, where as independent t-test, Man Whittney test was used for comparison of mean difference between two groups. A p-value of < 0.05 was considered statistically significant.

RESULTS

Variables		Number	Percentage (%)
Age	≤ 30 years	28	29.2
	31-49years	44	45.8
	≥ 50 years	24	25.0
Gender	Male	65	67.7
	Female	31	32.3
Grade of hemorrhoid	Grade II	24	25.0
	Grade III	59	61.5
	Grade IV	13	13.5

Table 1: Sociodemographic Characteristics of patients (n=96)

A total of 96 patients undergone LHP were included in the study. The age distribution demonstrated that a larger proportion, 44(45.8%) of patients were 31-49 years, while those aged 30 years or younger accounted for 28(29.2%) patients. In terms of sex distribution, males represented a slight majority, 65 (67.7%) compared to females 31(32.3%). (Table 1) When classified according to the severity of hemorrhoidal disease, Grade III hemorrhoids were the most frequently encountered (59 patients, 61.5%). This was followed by Grade II hemorrhoids 24 (25.0%) and Grade IV hemorrhoids13(13.5%). Hence, the majority of the cohort presented with advanced disease requiring intervention. (Table 1)

Table 2: Distribution of patients according to operative and early post-operative factor (n=96)

Variables	Cases of laser haemorrhoidoplasty	
	Range	Mean ± SD
Operative time (min)	15-28	19.72±3.19
Intraoperative bleeding (ml)	5-15	9.81±3.44
Post-Operative Pain Score (VAS/NRS)		
1st POD	2-6	3.21±1.01
3rd POD	0-4	1.40±1.04
14th POD	0-2	0.16±0.40
Duration until pain subside (days)	3-16	8.36±3.40
Time to regain routine activities (days)	3-16	8.08±3.55

The mean operative duration was 19.72±3.19 minutes, with the shortest procedure completed in 15 minutes and the longest in 28 minutes. Intraoperative blood loss was remarkably low across the cohort, with an average of 9.81±3.44 ml (range: 5-15 ml). (Table 2)

Post-operative pain assessed using the Visual Analogue Scale (VAS), showed the decreasing trend overtime. The mean VAS score was highest on 1st POD (3.21±1.01; range 2-6), which markedly decreased by the 3rd POD (1.40±1.04; range 0-4), and further reduced to 0.16±0.40 (range 0-2) by 2nd week. Regarding pain duration, most patient reported subsidence of pain within 3 to 4 days after surgery. Even among patients with higher grade hemorrhoids, pain had completely subsided by 16 days at the latest. On average pain lasted 8.36±3.40 (range 3-16 days). (Table 2)

With respect to functional recovery, patients were able to return to their routine daily activities within a short period. The average time required was 8.08 ± 3.55 days, with the earliest return reported at 3 days and the latest at 16 days post procedure. (Table 2)

Table 3: Relation between hemorrhoid grade with short term outcomes after LHP (n=96)

Patient underwent LHP				
	Grade II	**Grade III**	**Grade IV**	***p* value**
Post-operative bleeding (1st POD)				
Yes	2 (8.3%)	16 (27.1%)	9 (69.2%)	0.000
No	22(91.7%)	43 (72.9%)	4 (30.8%)	
Post-operative Bleeding (3rd POD)				
Yes	2 (8.3%)	17 (28.8%)	10 (76.9%)	0.000
No	22 (91.7%)	42 (71.2%)	3 (23.1%)	
Submucosal Oedema				
Yes	1 (4.2%)	36 (61.0%)	9 (69.2%)	0.000
No	23 (95.8%)	23 (39.0%)	4 (30.8%)	
Abscess				
Yes	0 (0.0%)	1 (1.7%)	2 (15.4%)	0.618
No	24(100.0%)	58 (98.3%)	11 (84.6%)	
Hematoma				
Yes	0 (0.0%)	2 (3.4%)	0 (0.00%)	0.259
No	24(100.0%)	57(96.6%)	13(100.0%)	

Fisher exact test, P value <0.05 is significant

Short-term Outcomes

Postoperative bleeding showed a significant association with hemorrhoid grade ($p < 0.001$). On the first postoperative day (POD), bleeding was observed in 9 patients (69.2%) with Grade IV hemorrhoids, 16 patients (27.1%) with Grade III, and 2 patients (8.3%) with Grade II. Among the 27

cases with first-day bleeding, 2 had spontaneous bleeding, while the remaining 25 experienced bleeding during defecation. A similar trend was observed on the third POD, with bleeding reported in 76.9% of Grade IV, 28.8% of Grade III, and 8.3% of Grade II patients, all occurring during defecation ($p < 0.001$). (Table 3)

Submucosal edema was another common short-term finding, with a significantly higher frequency in Grade IV hemorrhoids (69.2%), compared with Grade III (61.0%) and Grade II (4.2%) ($p < 0.001$). Moreover, hematoma was not seen in Grade II or IV cases, but occurred in 3.4% of Grade III patients (on perianal region -at 11 o'clock position) which was managed conservatively without further intervention), with no significant association ($p = 0.689$). Abscess was absent in Grade II, noted in 1.7% of Grade III, and 15.4% of Grade IV patients, also without significant relation ($p = 0.610$). Within the first postoperative week (4-5days), patient with abscess formation were presented to the outpatient department for management. (Table 3)

Table 4: Relation between hemorrhoid grade with long term outcomes after LHP (after 1 year of LHP) (n=96)

	Patient underwent LHP			
	Grade II	**Grade III**	**Grade IV**	***p* value**
Bleeding				
Yes	0 (0.0%)	0 (0.0%)	2 (15.4%)	0.017
No	24(100.0%)	59(100.0%)	11 (84.6%)	
Stenosis				
Yes	0 (0.0%)	0 (0.0%)	2 (15.4%)	0.017
No	24(100.0%)	59(100.0%)	11 (84.6%)	
Perianal Fissure				
Yes	0 (0.0%)	0 (0.0%)	2 (15.4%)	0.017
No	24(100.0%)	59(100.0%)	11 (84.6%)	
Perianal Fistula				
Yes	0 (0.0%)	0 (0.0%)	1 (7.7%)	0.135
No	24(100.0%)	59(100.0%)	12 (92.3%)	

Fisher exact test, P value <0.05 is significant

Long-term Outcomes

On one-year follow-up of patients who underwent LHP, long-term complications were observed exclusively in those with Grade IV hemorrhoids. Postoperative bleeding, anal stenosis, and perianal fissure were each reported in 15.4% of Grade IV patients, whereas no such complications were noted in Grade II or Grade III cases ($p = 0.017$ for each). A low-lying perianal fistula was identified in only one patient (7.7%) with Grade IV hemorrhoids, with no cases detected in Grades II or III ($p = 0.135$).

The fistula was managed with fistulotomy during the follow-up visit. Notably, none of the patients treated with LHP developed incontinence or recurrence within the first postoperative year. (Table 4)

DISCUSSION

Hemorrhoids are a common anorectal disorder with management options ranging from conservative therapy and office procedures to conventional hemorrhoidectomy. Although excisional surgery is effective, it is often associated with significant pain and delayed recovery. [14,15] Minimally invasive techniques, especially Laser Haemorrhoidoplasty (LHP), have recently gained popularity for providing effective symptom control with less morbidity and faster return to normal activity. [15,16,17] In this context, our study evaluated the effectiveness of Laser Haemorrhoidoplasty (LHP) in patients with Grade II-IV hemorrhoids, assessing demographic characteristics, perioperative outcomes, and both short- and long-term postoperative results over a one-year follow-up.

Sociodemographic Characteristics

In our cohort, the majority of patients were aged 31-49 years (45.8%), with a male predominance (67.7%). This aligns with previous studies reporting higher incidence of symptomatic hemorrhoids in middle-aged adults, particularly among males, possibly due to lifestyle factors, occupational strain, and dietary habits. [18,19,20] The higher proportion of Grade III cases (61.5%) reflects common practice as patients usually seek surgical care only after conservative treatment is unsuccessful.

Operative and Early Postoperative Outcomes

The mean operative time (19.42 ± 3.19 minutes) and minimal intraoperative blood loss (9.81 ± 3.44 ml) in this study highlight the minimally invasive nature of LHP. Similar findings have been reported in multiple studies, which demonstrated that laser procedures reduce operative duration and perioperative bleeding compared to other surgical treatment measure. [14,16,20]

Postoperative pain showed a clear declining trend, with the highest VAS score on the first postoperative day (3.21 ± 1.01), decreasing to near-zero by the second week. The average pain duration

of 8.36±3.40 days and rapid return to routine activities (mean 8.08±3.55 days) further underscore the patient-friendly nature of LHP. These findings corroborate previous reports indicating reduced postoperative pain and faster recovery with laser techniques, particularly when compared with excisional hemorrhoidectomy, where pain and functional limitation can last 2-3 weeks. [18,19,20]

Short-term Outcomes

Postoperative bleeding and submucosal edema were significantly associated with hemorrhoid grade. Grade IV hemorrhoids had the highest bleeding incidence, while hematoma and abscess were rare and mostly limited to Grade III and IV. These results are consistent with earlier studies indicating that advanced hemorrhoids are more prone to early postoperative complications, although overall complication rates in LHP remain low. [18,19,20] Notably, in our study, most bleeding episodes were minor and occurred during or after defecation, similar to the pattern reported in prior literature. [20]

Long-term Outcomes

At one-year follow-up, complications such as postoperative bleeding, stenosis, and perianal fissure were observed exclusively in patients with Grade IV hemorrhoids (15.4%), whereas low-lying fistula was rare (7.7%). No recurrences or incontinence were reported in any patients. This is a noteworthy finding, as some previous studies have documented cases of recurrence following LHP. [18,19,20,21] Meanwhile, non-recurrence may be due to the relatively short duration of follow-up (up to 1 year) and careful patient selection; larger studies with longer follow-up are needed to confirm long-term recurrence rates. The absence of major complications in our cohort supports the safety and durability of LHP, particularly for Grades II and III hemorrhoids. Patients with Grade IV disease experienced slower recovery and greater discomfort, likely due to larger tissue volume, more extensive mucosal involvement, and increased technical difficulty in achieving complete coagulation and shrinkage.

Overall, our results reinforce that LHP is a safe, effective, and minimally invasive option for symptomatic hemorrhoids, offering low perioperative morbidity, rapid functional recovery, and favorable short- and long-term outcomes. Laser haemorrhoidoplasty is safe and effective for Grades

II–III haemorrhoids, with minimal complications and rapid recovery. In Grade IV cases, careful technique and knowledge of tissue anatomy are essential to reduce discomfort and adverse events. Surgeon experience and familiarity with the laser device and fiber handling contributed to low complication rates, highlighting the importance of a structured learning curve.

This is the single centered preliminary study, so findings could not be generalized.

CONCLUSIONS

Laser haemorrhoidoplasty appears safe and effective for Grades II–III haemorrhoids, with minimal complications, mild pain, and early recovery. In patients with Grade IV disease, complication rates were higher, indicating that advanced disease may limit outcomes even with laser treatment. As a single-center, non-comparative study, these findings should be interpreted with caution, and further controlled studies are needed to confirm efficacy and long-term outcomes.

CONFLICT OF INTEREST

None

SOURCES OF FUNDING

None

REFERENCES

1. Lohsiriwat V. Treatment of haemorrhoids: a coloproctologist's view. World J Gastroenterol. 2015;21(31):9245–52. [DOI]
2. Ganz RA. The evaluation and treatment of haemorrhoids: a guide for the gastroenterologist. Clin Gastroenterol Hepatol Of Clin Pract J Am Gastroenterol Assoc. 2013;11(6):593–603. [DOI]
3. Sandler RS, Peery AF. Rethinking what we know about hemorrhoids. Clin Gastroenterol Hepatol Of Clin Pract J Am Gastroenterol Assoc. 2019;17(1):8–15. [DOI]
4. Koh FH, Foo FJ, Ho L, Sivarajah SS, Tan WJ, Chew MH (2020) Study protocol for the use of conventional open haemorrhoidectomy versus laser haemorrhoidoplasty in the treatment of

symptomatic haemorrhoids: a randomized controlled trial. Euro Surg Res. 2020;61(6):201–8. [DOI]

5. Van Tol RR, Kleijnen J, Watson AJM, Jongen J, Altomare DF, Qvist N. European Society of ColoProctology: guideline for haemorrhoidal disease. Colorectal Dis 2020;22(6):650–662. [DOI]
6. Dekker L, Han-Geurts IJM, Grossi U, Gallo G, Veldkamp R. Is the Goligher classifcation a valid tool in clinical practice and research for hemorrhoidal disease? Tech Coloproctol 2022;26(5):387–392. [DOI]
7. Bhatti MI, Sajid MS, Baig MK. Milligan-Morgan (Open) versus ferguson haemorrhoidectomy (closed): a systematic review and meta-analysis of published randomized, controlled trials. World J Surg. 2016; 40:1509–19. [DOI]
8. Hoyuela C, Carvajal F, Juvany M, Troyano D, Trias M, Martrat A. HAL-RAR (Doppler guided haemorrhoid artery ligation with recto-anal repair) is a safe and efective procedure for haemorrhoids. Results of a prospective study after two-years follow-up. Int J Surg. 2016; 28:39–44. [DOI]
9. Burch J, Epstein D, Baba-Akbari A, Weatherly H, Fox D, Golder S. Stapled haemorrhoidectomy (haemorrhoidopexy) for the treatment of haemorrhoids: a systematic review and economic evaluation. Health Technol Assess. 2008;12(8). [DOI]
10. Van Tol RR, Bruijnen MPA, Melenhorst J, van Kuijk SMJ, Stassen LPS, Breukink SO. A national evaluation of the management practices of hemorrhoidal disease in the Netherlands. Int J Colorectal Dis. 2018;33(5):577–88. [DOI]
11. Longchamp G, Liot E, Meyer J, Toso C, Buchs NC, Ris F. Non-excisional laser therapies for hemorrhoidal disease: a systematic review of the literature. Lasers Med Sci. 2021;36(3):485–96. [DOI]
12. Gallo G, Martellucci J, Sturiale A, Clerico G, Milito G, Marino F, Cocorullo G, Giordano P, Mistrangelo M, Trompetto M. Consensus statement of the Italian society of colorectal surgery (SICCR): management and treatment of hemorrhoidal disease.

Tech Coloproctol. 2020;24(2):145–64. [DOI]

13. Johanson JF, Sonnenberg A. The prevalence of hemorrhoids and chronic constipation. An epidemiologic study. Gastroenterology. 1990 Feb;98(2):380-6. [DOI]
14. Ram E, Kayzer M, Zager Y, Anteby R, Nachmany I, Carter D, Meyer R, Horesh N. Laser hemorrhoidoplasty for II-IV grade hemorrhoids: should we treat them the same? Updates Surg. 2023 Apr;75(3):635-642. [DOI]
15. Bhattarai A, Adhikari D, Poudel S, Mehta AK, Yadav DK, Parajuli B, Abhilekh KS. Laser Haemorrhoidoplasty for Treatment of the Hemorrhoids in Eastern Nepal. Journal of Nobel Medical College. 2023;12(2):9-14. [DOI]
16. Faes S, Pratsinis M, Hasler-Gehrer S, Keerl A, Nocito A. Short- and long-term outcomes of laser haemorrhoidoplasty for grade II-III hemorrhoidal disease. Colorectal Dis. 2019 Jun;21(6):689-696. [DOI]
17. Rahman AT, Islam MS, Khan SI, Shahinuzzaman MM, Ahmed S, Rahman AZ. Efficacy and Long-term Outcome of Laser hemorrhoidoplasty (LHP) for Symptomatic Grade II to IV Hemorrhoids. Faridpur Med. Coll. J. 2025;20(1):13-1 [DOI]
18. Narendranath, NVL NR, Rao L. A comparative study on laser hemorrhoidoplasty versus conventional hemorrhoidectomy for grade III hemorrhoids. Int J Med Pub Health. 2025; 15 (2); 83-86. [DOI]
19. Patel NK. Comparative Study of Laser Hemorrhoidoplasty and Open Hemorrhoidectomy in the Management of Grade II–III Hemorrhoids. EJCM. 2025;15(2): 714-717. [DOI]
20. Trikha A. Comparative Analysis of Laser Hemorroidoplasty versus Open Haemorroidectomy. Annals of International Medical and Dental Research. 2019;5(5):2395-2814. [DOI]

21. Poskus T, Danys D, Makunaite G, Mainelis A, Mikalauskas S, Poskus E, Jotautas V, Dulskas A, Jasiunas E, Strupas K. Results of the double-blind randomized controlled trial comparing laser hemorrhoidoplasty with sutured mucopexy and excisional hemorrhoidectomy. Int J Colorectal Dis. 2020 Mar;35(3):481-490. [DOI]