*Biological and Clinical Sciences Research Journal*
*eISSN: 2708-2261; pISSN: 2958-4728*
*www.bcsrj.com*
DOI: https://doi.org/10.54112/bcsrj.v6i5.1824
*Biol. Clin. Sci. Res. J., Volume 6(5), **2025**: 1824*
***Original Research Article***

# Comparative Outcome of Laser Hemorrhoidoplasty Versus Conventional Hemorrhoidectomy for Grade II/III Hemorrhoids

**Muhammad Hasnat Ul Hasan*, Khalil Ahmed, Hamail Khanum, Muhammad Arslan, Qaim Din, Muhammad Asad Javed**

*Department of Surgery, Gulab Devi Hospital, Lahore, Pakistan*
**Corresponding author`s email address:* m.hasnathasan64@gmail.com

*(Received, 24th April 2025, Accepted 28th May 2025, Published 31st May 2025)*

**Abstract:** *Hemorrhoids are a prevalent anorectal condition with significant morbidity when symptomatic. Conventional hemorrhoidectomy remains the gold standard for grade II/III hemorrhoids but is associated with notable postoperative discomfort and extended hospital stays. Laser hemorrhoidoplasty (LHP) has emerged as a minimally invasive alternative with potentially better outcomes, though limited evidence exists in the local Pakistani population.* ***Objective:*** *To compare mean operative time, postoperative pain, and hospital stay between laser hemorrhoidoplasty and conventional Milligan-Morgan hemorrhoidectomy in patients with grade II/III hemorrhoids.* ***Methods:*** *This randomized controlled trial was conducted at the Department of General Surgery, Gulab Devi Hospital, Lahore, from January to March 2025. A total of 100 patients with symptomatic grade II/III hemorrhoids were enrolled using non-probability consecutive sampling and randomized equally into two groups: Group A underwent conventional open hemorrhoidectomy, and Group B received laser hemorrhoidoplasty. Key outcomes measured included operative time (in minutes), pain at one week post-operatively (VAS score), and hospital stay (in hours). Data were analyzed using SPSS version 26.0, and independent t-tests were applied with $p < 0.05$ considered statistically significant.* ***Results:*** *The mean age of the study participants was 42.6 ± 11.3 years. Male patients constituted 62% of the sample. The LHP group had significantly reduced mean operative time (14.8 ± 3.2 min vs. 30.2 ± 4.1 min, $p < 0.001$), lower postoperative pain scores (3.7 ± 0.7 vs. 6.5 ± 0.6, $p < 0.001$), and shorter hospital stays (8.1 ± 2.0 hrs vs. 36.4 ± 6.3 hrs, $p < 0.001$) compared to the conventional group. These differences remained significant across stratified analyses for hemorrhoid grade, comorbidities, and lifestyle factors.* ***Conclusion:*** *Laser hemorrhoidoplasty is superior to conventional hemorrhoidectomy in terms of operative efficiency, reduced postoperative pain, and shorter hospitalization. These findings advocate for the adoption of LHP as a first-line surgical intervention for grade II/III hemorrhoids in the Pakistani healthcare setting.*

**Keywords:** Hemorrhoids, Laser Hemorrhoidoplasty, Conventional Hemorrhoidectomy, Operative Time, Postoperative Pain, Hospital Stay, Randomized Controlled Trial

[***How to Cite:*** Hasan MHU, Ahmed K, Khanum H, Arslan M, Din Q, Javed MA. Comparative outcome of laser hemorrhoidoplasty versus conventional hemorrhoidectomy for grade ii/iii hemorrhoids. *Biol. Clin. Sci. Res. J.*, **2025;** 6(5): 243-246. doi: https://doi.org/10.54112/bcsrj.v6i5.1824

## Introduction

Hemorrhoids are a commonly encountered issue in the anorectal area. People who have hemorrhoids often report various symptoms. Still, the most prominent among them are bleeding and protrusion (1). The primary goal of treating hemorrhoids is to relieve these symptoms, rather than focusing on improving the appearance of the anal canal. It's estimated that worldwide, hemorrhoidal disease affects between 2.9% and 27.9% of the population, with over 4% of these cases being symptomatic (2). About a third (33.3%) of individuals with hemorrhoids seek medical advice for their condition (3). The prevalence of hemorrhoids follows a typical distribution, with the highest occurrence between the ages of 40 and 65, decreasing after the age of 65 (4). Female patients are less commonly affected compared to males. The anorectal vascular cushions, in combination with the internal anal sphincter (IAS), play a crucial role in maintaining continence by offering support and ensuring a tight closure of the anal canal (5). Hemorrhoids are typically caused by the downward displacement of the suspensory (Treitz) muscle. Patients with hemorrhoidal issues may experience various symptoms, but the two main ones are bleeding and protrusion (6). Asymptomatic hemorrhoids generally do not require treatment. The approach to treatment can range from simple measures like dietary adjustments and changes in bowel habits to medical procedures and surgical hemorrhoidectomy (7).

Patients who have asymptomatic hemorrhoids do not require any intervention. The treatment options for this condition vary, ranging from basic strategies like making dietary changes and adjusting bowel habits to medical procedures and surgical procedures such as hemorrhoidectomy. For individuals with symptomatic third and fourth-degree piles, the preferred treatment is hemorrhoidectomy. However, it's important to note that while hemorrhoidectomy is generally viewed as a minor procedure, it is associated with significant postoperative complications, including severe pain, bleeding, extended operative duration, and wound infections, all of which can lead to a lengthened recovery period (8).

Recent advancements in medical devices, such as laser hemorrhoidoplasty, have emerged as effective alternatives to traditional treatments for hemorrhoids. These innovations offer advantages such as reduced pain, less blood loss, faster wound healing, and a quicker return to regular activities. The management approaches for symptomatic hemorrhoid patients have evolved. These alternative methods have included conservative medical management, non-surgical interventions, and a range of surgical procedures (9), such as band ligation (RBL), injection sclerotherapy, cryotherapy, and infrared coagulation. These procedures can be performed on an outpatient basis without the need for anesthesia. Non-surgical interventions are typically the initial choice for grades I to III hemorrhoids. However, if conservative treatments fail to control symptoms, the treatment strategy is shifted towards surgical options. Indications for surgery include the presence of a substantial external component, enlarged papillae, thrombosed piles, or recurrent symptoms (10).

The surgical method typically employed is the open Milligan–Morgan hemorrhoidectomy, which involves the use of instruments like scalpels, scissors, and electrocautery. In the United Kingdom, Milligan-Morgan hemorrhoidectomy is considered the gold standard and is frequently performed. Post-hemorrhoidectomy pain is the most common and severe

complication associated with surgical procedures. Other early complications may include urine retention (20.1%), bleeding (secondary or reactionary) (2.4%–6%), and subcutaneous abscess (0.5%). Delayed complications may consist of anal fissures (1% -2.6%), anal stenosis (1%), incontinence (0.4%), fistula (0.5%), and the recurrence of hemorrhoids (11).

In a study by Yahya WN et.al., the mean hospital stay for the MMH group was 36.25 ± 6.58 hours and 7.85 ± 2.11 hours for LHP; the mean operative time was 29.53 ± 4.05 and 14.60 ± 3.13 minutes for MMH and LHP groups, respectively, and post-operative pain was 6.53±0.51 in MMH and 3.66±0.72 in LHP groups after one week of procedure. (12)

In our study, we will compare intraoperative time, postoperative pain, and hospital stay among both groups, i.e., laser hemorrhoidoplasty (LHP) vs. open hemorrhoidectomy. The rationale of our study is that no such research has been conducted in our local population. International studies have been conducted; however, data at the national level are scarce. Hence, it is necessary to perform a survey at our setup to establish local guidelines. Thus, the objective of this study is to compare the mean operative time, postoperative pain, and hospital stay between Laser Hemorrhoidectomy and conventional hemorrhoidectomy for grade II/III hemorrhoids.

**Methodology**

This randomized controlled trial was conducted in the Department of General Surgery at Gulab Devi Hospital, Lahore, over three months from January 2025 to March 2025, following approval of the synopsis. A total of 100 patients diagnosed with symptomatic second or third-degree hemorrhoids were enrolled using non-probability consecutive sampling. The study was designed to compare the outcomes of two surgical techniques: laser hemorrhoidoplasty (LHP) and conventional open hemorrhoidectomy (Milligan-Morgan Hemorrhoidectomy). After obtaining ethical approval and written informed consent, participants were randomly assigned to two equal groups, each comprising 50 patients. Eligibility criteria included adults aged between 18 and 75 years, presenting with grade II or III hemorrhoids. Patients with coexisting anorectal diseases such as fistula, abscess, rectal carcinoma, or inflammatory bowel disease were excluded from the study.

Baseline assessments included comprehensive demographic data, detailed medical histories, and physical examinations, including per rectal evaluation and proctoscopy. Routine preoperative investigations were performed for all participants, including complete blood count, random blood glucose, liver and renal function tests, and coagulation profiles. Patients in Group A underwent open surgical hemorrhoidectomy, where a V-shaped incision was made at the base of the hemorrhoid, followed by submucosal dissection using electrocautery. The hemorrhoidal pedicle was ligated with 2/0 Vicryl and excised. This procedure was repeated for all involved hemorrhoidal segments, ensuring the preservation of skin bridges to prevent anal stenosis. Wounds were left open and packed with a light dressing and topical gentamicin.

Patients in Group B underwent laser hemorrhoidoplasty using a Lasotronix laser system (Poland). The procedure was conducted in the lithotomy position under standard aseptic conditions. A dedicated disposable proctoscope was inserted into the anal canal, and a small (1 cm) skin incision was made approximately 1 cm from the anal verge. A diode laser (980 nm) fiber was inserted into the hemorrhoidal plexus, ensuring parallel alignment with the anal canal to avoid mucosal injury. Laser energy was delivered at 7.5 W in 3-second bursts with 0.5-second pauses, achieving tissue shrinkage to a depth of approximately 5 mm. After each hemorrhoid was treated, an ice finger was inserted into the anal canal to mitigate thermal injury. Postoperative outcomes, including operative time (measured in minutes), pain score after one week (measured on a visual analogue scale from 0 to 10), and hospital stay (measured in hours), were recorded as per operational definitions.

Data were entered and analyzed using SPSS version 26.0. Continuous variables such as age, operative time, pain score, and duration of hospital stay were expressed as means with standard deviations. Categorical variables, including gender, hemorrhoid grade, comorbidities (hypertension, diabetes mellitus), lifestyle, and smoking status, were summarized as frequencies and percentages. Independent t-tests were used to compare the mean values of outcome measures between the two groups. Stratification was performed based on age, gender, hemorrhoid grade, and comorbid factors to control confounding effects. A p-value of $<0.05$ was considered statistically significant throughout the analysis.

**Results**

This randomized controlled trial enrolled a total of 100 patients with symptomatic grade II or III hemorrhoids at the Department of General Surgery, Gulab Devi Hospital, Lahore. The participants were randomly allocated into two equal groups: Group A (Conventional Hemorrhoidectomy) and Group B (Laser Hemorrhoidoplasty), each comprising 50 patients. The mean age of the overall study population was 42.6 ± 11.3 years, with a range of 20 to 75 years. A majority of the participants were male (62%), while females constituted 38%. Most patients resided in urban areas and led sedentary lifestyles. The prevalence of comorbid conditions such as hypertension and diabetes was 28% and 21% respectively. Smoking was reported by 23% of the patients.

**Table 1. Demographic and Baseline Clinical Characteristics of Study Participants (n = 100)**

| Variable | Group A (n=50) | Group B (n=50) | Total (n=100) |
|---|---|---|---|
| Age (Mean ± SD) | 43.1 ± 11.7 | 42.0 ± 10.9 | 42.6 ± 11.3 |
| **Gender** | | | |
| Male | 31 (62%) | 31 (62%) | 62 (62%) |
| Female | 19 (38%) | 19 (38%) | 38 (38%) |
| **Grade of Hemorrhoids** | | | |
| Grade II | 27 (54%) | 26 (52%) | 53 (53%) |
| Grade III | 23 (46%) | 24 (48%) | 47 (47%) |
| Hypertension | 13 (26%) | 15 (30%) | 28 (28%) |
| Diabetes Mellitus | 11 (22%) | 10 (20%) | 21 (21%) |
| Smoking | 12 (24%) | 11 (22%) | 23 (23%) |
| **Lifestyle** | | | |
| Active | 20 (40%) | 22 (44%) | 42 (42%) |
| Sedentary | 30 (60%) | 28 (56%) | 58 (58%) |

In Table 2, laser hemorrhoidoplasty significantly reduced operative time, postoperative pain at one week, and hospital stay when compared to conventional hemorrhoidectomy ($p < 0.001$ for all outcomes).

**Table 2. Comparison of Primary Outcomes Between Groups**

| Outcome Variable | Group A (Conventional) | Group B (Laser) | p-value |
|---|---|---|---|
| Mean Operative Time (min) | 30.2 ± 4.1 | 14.8 ± 3.2 | < 0.001 |
| Mean Pain Score (VAS) | 6.5 ± 0.6 | 3.7 ± 0.7 | < 0.001 |
| Hospital Stay (Hours) | 36.4 ± 6.3 | 8.1 ± 2.0 | < 0.001 |

As shown in Table 3, patients in both the grade II and grade III subgroups experienced significantly less pain in the laser group compared to the conventional group.

**Table 3. Stratified Analysis of Postoperative Pain by Hemorrhoid Grade**

| Grade of Hemorrhoids | Group A (VAS Score) | Group B (VAS Score) | p-value |
|---|---|---|---|
| Grade II | 6.3 ± 0.5 | 3.5 ± 0.6 | < 0.001 |
| Grade III | 6.7 ± 0.7 | 3.9 ± 0.8 | < 0.001 |

In Table 4, regardless of comorbid conditions, patients undergoing laser hemorrhoidoplasty consistently had a shorter operative time compared to those undergoing conventional hemorrhoidectomy.

**Table 4. Stratification of Operative Time by Comorbidities**

| Condition | Group A (min) | Group B (min) | p-value |
|---|---|---|---|
| Diabetic | 30.8 ± 4.4 | 15.1 ± 3.1 | < 0.001 |
| Hypertensive | 30.3 ± 4.3 | 15.0 ± 3.0 | < 0.001 |
| Non-comorbid | 29.7 ± 3.8 | 14.5 ± 3.3 | < 0.001 |

**Table 5. Hospital Stay Stratified by Smoking Status and Lifestyle**

| Factor | Group A (Hours) | Group B (Hours) | p-value |
|---|---|---|---|
| Smoker | 37.5 ± 6.1 | 8.3 ± 2.2 | < 0.001 |
| Non-smoker | 35.6 ± 6.4 | 8.0 ± 2.0 | < 0.001 |
| Sedentary | 36.7 ± 6.6 | 8.2 ± 1.9 | < 0.001 |
| Active | 36.1 ± 6.0 | 7.9 ± 2.1 | < 0.001 |

Table 5 illustrates that laser hemorrhoidoplasty leads to a significantly shorter hospital stay irrespective of smoking status or physical activity levels.

Laser hemorrhoidoplasty (Group B) demonstrated superior outcomes in all measured parameters compared to conventional open hemorrhoidectomy (Group A). The significant reduction in operative time, pain levels, and hospital stay highlights the minimally invasive and patient-friendly nature of laser treatment. The results remain consistent across demographic strata, comorbidity profiles, and lifestyle variables, supporting the robustness and generalizability of these findings to the Pakistani population.

## Discussion

The results of the randomized controlled trial conducted on patients with grade II and III hemorrhoids provide evidence regarding the efficacy of laser hemorrhoidoplasty (LHP) compared to conventional hemorrhoidectomy (CH). The findings indicate that LHP significantly reduces operative time, postoperative pain, and hospital stay, suggesting that LHP is a more efficient and patient-friendly approach to managing hemorrhoidal disease.

The mean operative time was notably shorter in the LHP group (14.8 ± 3.2 minutes) compared to the CH group (30.2 ± 4.1 minutes), aligning with the findings from a systematic review that reported shorter surgical durations associated with laser techniques due to their precision and efficiency (13). Furthermore, when stratified by comorbid conditions, the results remained consistent, with LHP demonstrating reduced operative times across all subgroups, including those with diabetes and hypertension. However, specific citations supporting this stratification are limited (14).

Postoperative pain, measured using the Visual Analog Scale (VAS), was also significantly lower in the LHP group (3.7 ± 0.7) compared to the CH group (6.5 ± 0.6). Similar outcomes have been reported in recent literature, highlighting LHP as a minimally invasive alternative that may enhance recovery through effective pain management (15,13). This reduction in pain post-surgery is crucial, as it significantly impacts the overall patient experience and the time required for patients to resume their daily activities.

The reduction in hospital stay associated with LHP (8.1 ± 2.0 hours versus 36.4 ± 6.3 hours for CH) is another significant outcome of this study. Lengthy hospital stays have been linked to increased healthcare costs and resource utilization (16), underscoring the potential benefits of LHP in this aspect.

Comorbidity profiles did not show significant differences between the two groups, indicating effective randomization and suggesting that demographic factors, such as age, gender distribution, and lifestyle, do not confound the interpretation of outcomes (17). This is crucial as it strengthens the applicability of these results within the studied patient population.

Despite yielding significant results, this study had certain limitations. It was conducted at a single center, which may limit the generalizability of the findings to other settings or populations. The follow-up period was limited to short-term postoperative outcomes, and long-term complications such as recurrence or delayed healing were not assessed.

Additionally, patient-reported pain scores may be subject to individual perception and reporting bias. Future multicenter studies with longer follow-up durations are recommended to validate these findings.

## Conclusion

In conclusion, the trial's outcomes significantly favor laser hemorrhoidoplasty over conventional hemorrhoidectomy, providing evidence for its adoption as a treatment modality. Further studies should investigate long-term outcomes and any potential complications unique to laser techniques to ensure holistic patient care. Therefore, given the consistently superior outcomes in terms of operative time, pain management, and hospital stay, LHP should be considered a primary option for managing symptomatic grade II and III hemorrhoids.

## Declarations

**Data Availability statement**
All data generated or analysed during the study are included in the manuscript.
**Ethics approval and consent to participate**
Approved by the department concerned. (IRBEC -24)
**Consent for publication**
Approved
**Funding**
Not applicable

## Conflict of interest

The authors declared the absence of a conflict of interest.

## Author Contribution

**MHUH (Postgraduate Resident)**
*Manuscript drafting, Study Design,*
**KA (Professor of Surgery)**
*Review of Literature, Data entry, Data analysis, and drafting articles.*
**HK (Postgraduate Resident)**
*Conception of Study, Development of Research Methodology Design,*
**MA (Medical Officer)**
*Study Design, manuscript review, critical input.*
**QD (Associate Professor)**
*Manuscript drafting, Study Design,*
**MAJ (Senior Registrar)**
*Conception of Study, Development of Research Methodology Design,*

*All authors reviewed the results and approved the final version of the manuscript. They are also accountable for the integrity of the study.*

## References

1. José MMB. Initial experience of anorectal surgery with laser technique. EC Gastroenterol Dig Syst. 2020;7:1–11.
2. Lohsiriwat V. Treatment of hemorrhoids: a coloproctologist's view. World J Gastroenterol. 2015;21(31):9245–52. https://doi.org/10.3748/wjg.v21.i31.9245
3. Sun Z, Migaly J. Review of hemorrhoid disease: presentation and management. Clin Colon Rectal Surg. 2016;29(1):22–9. https://doi.org/10.1055/s-0035-1568144
4. Fontem RF, Eyvazzadeh D. Internal Hemorrhoid. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023 [cited 2025 Jul 12]. Available from: https://www.ncbi.nlm.nih.gov/books/NBK537182/
5. Sandler RS, Peery AF. Rethinking what we know about hemorrhoids. Clin Gastroenterol Hepatol. 2019;17(1):8–15. https://doi.org/10.1016/j.cgh.2018.03.020
6. Lee JM, Kim NK. Essential anatomy of the anorectum for colorectal surgeons focuses on the gross anatomy and histologic findings. Ann Coloproctol. 2018;34(2):59–71. https://doi.org/10.3393/ac.2017.12.15
7. Lohsiriwat V. Hemorrhoids: from basic pathophysiology to clinical management. World J Gastroenterol. 2012;18(17):2009–17. https://doi.org/10.3748/wjg.v18.i17.2009
8. 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. https://doi.org/10.1007/s10103-020-03142-8
9. Lie H, Caesarini EF, Purnama AA, et al. Laser hemorrhoidoplasty for hemorrhoidal disease: a systematic review and meta-analysis. Lasers Med Sci. 2022;37:3621–30. https://doi.org/10.1007/s10103-022-03643-8
10. Dekker L, Bak MTJ, Bemelman WA, Felt-Bersma RJF, Han-Geurts IJM. Hemorrhoidectomy versus rubber band ligation in grade III hemorrhoidal disease: a large retrospective cohort study with long-term follow-up. Ann Coloproctol. 2022;38(2):146–52. https://doi.org/10.3393/ac.2020.01011.0144
11. Long Q, Wen Y, Li J. Milligan-Morgan hemorrhoidectomy combined with non-Doppler hemorrhoidal artery ligation for the treatment of grade III/IV hemorrhoids: a single centre retrospective study. BMC Gastroenterol. 2023;23:293. https://doi.org/10.1186/s12876-023-02933-x
12. Yahya WN, Refaat DO, AbdElhady WA, Elsayed WA. Comparison between laser hemorrhoidoplasty procedure and conventional open surgical hemorrhoidectomy. Egypt J Hosp Med. 2022;86(1):112–6. https://dx.doi.org/10.21608/ejhm.2022.210781
13. Wee I., Koo C., Seow-En I., Ng Y., Lin W., & Tan E. Laser hemorrhoidoplasty versus conventional hemorrhoidectomy for grade II/III hemorrhoids: a systematic review and meta-analysis. Annals of Coloproctology 2023;39(1):3-10. https://doi.org/10.3393/ac.2022.00598.0085
14. Hossain M., Bhuiyan M., Nahid S., Anwar S., Khan H., & Nipa S.. Comparative study of short-term outcome between laser hemorrhoidoplasty and Milligan-Morgan hemorrhoidectomy. Iahs Medical Journal 2023; 5(2): 15-19. https://doi.org/10.3329/iahsmj.v5i2.66822
15. Poškus T., Danys D., Makūnaitė G., Mainelis A., Mikalauskas S., Poškus E.et al.. Results of the double-masked randomized controlled trial comparing laser hemorrhoidoplasty with sutured mucopexy and excisional hemorrhoidectomy. International Journal of Colorectal Disease 2020;35(3):481-490. https://doi.org/10.1007/s00384-019-03460-6
16. Chaudhary D., Tekam V., Mishra S., & Singh P. Comparative study between conventional hemorrhoidectomy and electrothermal bipolar vessel sealer for grade IV hemorrhoids. Asian Journal of Medical Sciences 2022;13(9):238-243. https://doi.org/10.3126/ajms.v13i9.44804
17. Gallo G., Grossi U., Tanna G., Santoro G., Paola G., Clerico G.et al.. Short-term outcomes of polycarbophil and propionibacterium acnes lysate gel after open hemorrhoidectomy: a prospective cohort study. Journal of Clinical Medicine 2020;9(12):3996. https://doi.org/10.3390/jcm9123996