A comparative study between laser hemorrhoidoplasty and open hemorrhoidectomy done for hemorrhoids in rural medical college

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Abstract

Introduction: Hemorrhoidal disease is among the most common anorectal conditions globally, often necessitating surgical intervention in advanced stages. This study was conducted to compare the clinical outcomes of Laser Hemorrhoidoplasty (LHP) and Open Hemorrhoidectomy (OH) in the management of Grade I to III hemorrhoids, particularly within the constraints of a rural healthcare setting.

Material & Methods: A prospective observational comparative clinical study was carried out involving 50 patients diagnosed with Grade I to III hemorrhoids. Participants were randomized into two equal groups: one underwent LHP and the other OH. Key variables assessed included operative time, intraoperative blood loss, postoperative pain (measured using the Verbal Descriptor Scale), complications, recovery parameters, and patient satisfaction at three months postoperatively.

Results: The mean operative duration was comparable between the two groups—56.84 minutes for LHP and 58.44 minutes for OH ($p > 0.05$). Postoperative pain scores showed no significant difference, with both groups reporting similar levels of mild to moderate discomfort. While LHP was associated with a slightly higher incidence of minor complications such as delayed hemorrhage (16%) and fissure formation (16%), the recurrence rate was notably higher in the OH group (32% vs. 16%). Intraoperative blood loss was nearly identical between groups. Patient satisfaction at three months post-surgery was marginally higher in the OH group (80%) than in the LHP group (68%).

Conclusion: Both LHP and OH are effective surgical modalities for the treatment of symptomatic hemorrhoids. LHP offers the benefits of a minimally invasive approach, including faster recovery and reduced postoperative morbidity, although it may be associated with a slightly higher incidence of minor complications. OH remains a robust and well-established technique, demonstrating slightly higher patient satisfaction and suitability in resource-constrained settings. Treatment choice should be individualized based on clinical presentation, surgeon expertise, and available infrastructure.

Keywords: Conventional haemorrhoidectomy, Haemorrhoids, haemorrhoidectomy,

Introduction

Hemorrhoidal disease is one of the most common anorectal conditions, affecting a significant portion of the global adult population. It results from the enlargement of veins in the anal canal, which can lead to symptoms such as bleeding, itching, pain, and prolapse. It is classified into four grades, ranging from mild (Grade 1) to severe (Grade 4). The condition is generally considered benign but can cause considerable discomfort and compromise the quality of life, especially for those with advanced stages. Although many patients can manage symptoms with conservative treatments, such as dietary changes, stool softeners, and

topical medications, surgical interventions are often necessary when symptoms become persistent or severe. [1]

Among the various surgical options for treating hemorrhoidal disease, two procedures have become the most widely discussed and practiced: open hemorrhoidectomy and laser hemorrhoidoplasty. Open hemorrhoidectomy has been considered the gold standard for the treatment of symptomatic grade 3 and grade 4 hemorrhoids. This technique involves the complete excision of the hemorrhoidal tissue, typically under general or spinal anesthesia. While effective, it is associated with significant postoperative pain, longer recovery times, and a higher incidence of complications such as bleeding, urinary retention, and wound infections. The significant discomfort and prolonged recovery period following open hemorrhoidectomy can be burdensome for patients. [2]

Laser hemorrhoidoplasty, on the other hand, is a more recent advancement in the treatment of hemorrhoids. This technique utilizes laser energy to coagulate and shrink the hemorrhoidal tissue. It is considered a minimally invasive procedure with a potential for less postoperative pain, reduced bleeding, and quicker recovery times. Laser hemorrhoidoplasty is generally associated with fewer complications compared to traditional hemorrhoidectomy, but it requires specialized equipment and expertise. The decision to use this technique often depends on factors like the severity of the hemorrhoidal disease and the available resources. [3]

Methodology

Study design: prospective comparative clinical study. Study duration 2 years

Study place : department of general surgery of Dhiraj general hospital, baroda

Study population: all patients of haemoorhoids admitted in ward of general surgery of Dhiraj hospital

Sample size: 50 cases

Sampling method: purposive

Sampling inclusion criteria:

- Adult patients aged 18-60 years.
- Male or female patients with symptomatic hemorrhoids (grade 1, 2, or 3).
- Patients who were willing to provide informed consent.
- Patients presenting with clinical and investigatory confirmation of hemorrhoidal disease.

Exclusion criteria:

- Patients who were unwilling to participate in the study.
- Individuals with cardiovascular diseases, cerebrovascular diseases, hepatic diseases, renal diseases, or arrhythmias.
- Pregnant and lactating women.
- Patients with inflammatory bowel disease, fissures, or fistula in ano.
- Patients diagnosed with malignancy.
- Patients with recurrent hemorrhoids or thrombosed hemorrhoids.

- Individuals aged <18 years or >60 years.
- Patients with asymptomatic hemorrhoids.
- Patients with severe comorbidities that might interfere with the recovery process.

All opd/ipd patients according to inclusion criteria under per rectal examination at opd/ward/ot of Dhiraj hospital after taking informed and written consent. A detailed history and thorough clinical examination was done with investigation like cbc ,rft,crp,serology. Operation were performed by experienced surgeons . later on outcomes were analysed comparing post operative status between the two categories

Statistical method:

The data were analyzed using statistical software (Microsoft Excel 2012) for descriptive and inferential statistics. Continuous variables such as age, duration of symptoms, and pain scores were expressed as mean and standard deviation (SD), while categorical variables such as gender and complication rates were expressed as frequencies and percentages. The Kolmogorov-Smirnov test was used to assess the normality of the data. For normally distributed data, the Student's t-test was used to compare the means between the two groups (open hemorrhoidectomy and laser hemorrhoidoplasty). For non-normally distributed data, the Mann-Whitney U test was employed to compare the differences between the groups. Categorical data, including complication rates and patient satisfaction, were analyzed using the Chi-square test. A p-value < 0.05 was considered statistically significant. Additionally, post- hoc analyses were conducted to determine if any significant differences existed across different time intervals. The results were tabulated and analyzed to assess the clinical outcomes and identify any significant differences between the two surgical techniques.

Results

1.Age-wise Distribution of Patients Undergoing Surgical Treatment

The age distribution of patients undergoing laser hemorrhoidoplasty and open hemorrhoidectomy was relatively similar across both groups. The highest proportion of patients in each group belonged to the 51–60 years age bracket (32%). Notably, younger patients (<30 years) constituted 28% of each group. While the 31–40 age group had a slightly higher representation in the open hemorrhoidectomy group (32%) compared to the laser group (20%), the 41–50 group showed the opposite trend. Overall, the demographic profile suggests a balanced age-wise selection for both surgical modalities.

Age Group (years)	Laser Hemorrhoidoplasty	Open Hemorrhoidectomy
<30	7 (28.0%)	7 (28.0%)
31–40	5 (20.0%)	8 (32.0%)
41–50	5 (20.0%)	2 (8.0%)
51–60	8 (32.0%)	8 (32.0%)

2. Gender Distribution Among Surgical Groups

The gender distribution showed that a higher proportion of males (64%) underwent laser hemorrhoidoplasty, while females were more likely to undergo open hemorrhoidectomy (60%). This difference may reflect patient preferences, clinical indications, or healthcare-seeking behavior across genders. Nonetheless, both procedures were utilized across both sexes, indicating their applicability irrespective of gender.

Gender	Laser Hemorrhoidoplasty	Open Hemorrhoidectomy
Female	9 (36.0%)	15 (60.0%)
Male	16 (64.0%)	10 (40.0%)

3.Previous Treatments Before Surgical Intervention

Analysis of previous treatment modalities revealed that rubber band ligation was the most common prior intervention among open hemorrhoidectomy patients (40%), while each modality—conservative management, rubber band ligation, and sclerotherapy—was equally represented (24%) in the laser group. Notably, 28% of patients in the laser group had no prior treatment, slightly more than those in the open surgery group (24%).

Previous Treatment	Laser Hemorrhoidoplasty	Open Hemorrhoidectomy
Conservative	6 (24.0%)	3 (12.0%)
None	7 (28.0%)	6 (24.0%)
Rubber band ligation	6 (24.0%)	10 (40.0%)
Sclerotherapy	6 (24.0%)	6 (24.0%)

4.Grade of Hemorrhoids Among Surgical Groups

Grade 2 hemorrhoids were the most common indication for surgery in both groups, comprising 48% of the laser and 36% of the open surgery cases. Interestingly, higher-grade hemorrhoids (Grade 3) were more frequently treated by open hemorrhoidectomy (48%), while lower grades (Grade 1 and 2) predominated in the laser group, indicating a preference for laser treatment in earlier stages.

Hemorrhoid Grade	Laser Hemorrhoidoplasty	Open Hemorrhoidectomy
Grade 1	7 (28.0%)	4 (16.0%)
Grade 2	12 (48.0%)	9 (36.0%)
Grade 3	6 (24.0%)	12 (48.0%)

5.Presenting Symptoms of Patients

The most common presenting symptom in both groups was bleeding (34% in laser, 31% in open surgery), followed by pain (28% in each group). Itching and prolapse were also reported with similar frequencies. Overall, symptom patterns were fairly consistent across groups, with no single symptom clearly distinguishing the need for one surgical approach over the other.

6.Comparison of Operative Time Between Surgical Procedures

The mean operative time for open hemorrhoidectomy was 58.44 minutes, slightly higher than the

56.84 minutes recorded for laser hemorrhoidoplasty. However, this difference was not statistically significant ($p = 0.766$), as confirmed by the independent samples t-test. The similarity in operative times suggests that both procedures are comparable in terms of duration, allowing surgical teams to consider other factors such as postoperative outcomes and patient comfort when selecting the optimal approach.

7.Postoperative Pain Levels in Laser and Open Hemorrhoid Surgery

Postoperative pain assessment using the Verbal Descriptor Scale (VDS) showed that mild pain was experienced equally by 36% of patients in both groups. Severe pain was slightly more common in the open surgery group (40%) compared to the laser group (32%). Moderate pain appeared more frequently in the laser group (28% vs. 16%), while complete absence of pain was reported by a small number of patients in both groups. The difference in pain levels was not statistically significant ($p = 0.712$), suggesting comparable postoperative pain experiences between procedures.

8.Postoperative Complications and Recovery Outcomes

A comprehensive evaluation of postoperative outcomes revealed comparable complication rates between laser hemorrhoidoplasty and open hemorrhoidectomy. Delayed hemorrhage and fissure/ulcer occurred more often in the laser group (16%) than in the open surgery group (4%). Urinary retention and anal incontinence were also slightly higher in the laser group. Recurrence was more frequent after open surgery (32% vs. 16%). Satisfaction at 3 months and overall postoperative recovery, including painkiller usage and return to normal activity, favored the open surgery group slightly. However, both groups exhibited similar infection rates and long-term complication profiles, suggesting clinical equivalency in safety.

9.Comparison of Operative Blood Loss Between Surgical Groups

The mean operative blood loss was nearly identical between the two surgical techniques: 121.16 ml for open hemorrhoidectomy and 122.76 ml for laser hemorrhoidoplasty. The standard deviations were moderately high in both groups, indicating variability in intraoperative blood loss across individual cases. However, the minimal mean difference (1.6 ml) suggests that both procedures are equivalent in terms of blood loss during surgery and can be considered comparably safe from a hemostatic standpoint.

Discussion :

This study was carried out in a rural medical college with the objective of comparing the outcomes of laser hemorrhoidoplasty (LHP) and open hemorrhoidectomy (OH) in patients with symptomatic Grade I–III hemorrhoids. A total of 50 patients were enrolled and equally divided into two groups of 25 each. Most participants were in the 51–60 year age range, but the gender distribution differed: in the LHP group, males predominated at 64%, whereas in the OH group, females predominated at 60%. This imbalance may be related to cultural norms, local perceptions of each procedure, and differences in healthcare-seeking patterns. Operative time averaged 56.84 minutes for LHP and 58.44 minutes for OH, with no statistically significant difference ($p = 0.766$). This finding contrasts with reports from other studies in which LHP is generally quicker; in the present setting, the similarity may be explained by the surgeon's learning curve with laser equipment, limited familiarity with device handling, and logistical factors inherent to rural operation theatres, whereas OH benefits from years of established proficiency. Pain assessment revealed mild pain in 36% of patients in both groups, moderate pain in 28% of LHP and 16% of OH patients, and severe pain in 32% of LHP versus 40% of OH, indicating a trend toward less severe pain with LHP, though the difference was not statistically significant ($p = 0.712$). Pain variations compared with other studies may reflect differences in analgesic regimens, sociocultural tolerance to discomfort, and the absence of a fully standardized visual analog scale in some cases. Recovery time averaged 3–5 days for LHP and 2–4 days for OH, a reversal of most published literature that often shows faster recovery with LHP; this may be due to conservative discharge practices in rural hospitals, patient preference for prolonged observation, and logistical issues such as transportation or home support. Intraoperative blood loss was similar between groups—122.76 ml in LHP and 121.16 ml in OH—with no significant difference, differing from studies suggesting a hemostatic benefit for LHP. This could be because of highly developed OH technique in this setting, along with limited optimization of laser energy parameters or fiber use in LHP cases. Postoperative complications occurred more frequently in LHP: delayed hemorrhage (16% vs. 4%), anal fissures or ulcers (16% vs. 4%), urinary retention (12% vs. none), and anal incontinence (20% vs. 8%). Recurrence rates, however, were higher in OH (32%) compared to LHP (16%), while infection rates were identical at 16% in both groups. Interestingly, despite LHP's lower recurrence rate, patient satisfaction was higher for OH at 80% versus 68% for LHP. This may be because OH is a long-established, trusted technique in rural areas, with a perception of being more definitive and reliable, whereas LHP—though modern—may have disappointed patients due to complications or unmet expectations. Cost is also a major factor; LHP requires expensive equipment and consumables, with ongoing maintenance challenges, while OH is inexpensive, requires no specialized devices, and benefits from extensive surgical expertise. In conclusion, while LHP theoretically offers certain advantages, such as reduced severe pain and lower recurrence, these benefits were not fully realized in this rural context, likely due to the learning curve, limited laser handling experience, infrastructure constraints, and patient-related social factors. In such settings, OH remains the more practical, cost-effective, and dependable option. However, with targeted training, infrastructure improvements, and consistent access to functioning laser systems, LHP could become a more competitive alternative in the future and potentially achieve the superior outcomes reported in other environments.

Summary :

Key Findings

- The mean operative time was similar for both LHP (56.84 minutes) and OH (58.44 minutes), with no statistically significant difference ($p = 0.766$). This contrasts with literature showing shorter operative times for LHP, possibly reflecting the learning curve in rural surgical settings.

- Both groups experienced a spectrum of postoperative pain. While LHP showed a trend toward fewer severe pain cases, the difference in pain intensity was not statistically significant ($p = 0.712$). This may be influenced by technique, pain management strategies, and subjective pain perception.

- Average hospital stay and operative blood loss were similar between the two groups. This differs from previous studies that highlight quicker recovery and lower blood loss with LHP, again indicating the importance of experience and institutional protocol.

- The LHP group had a slightly higher incidence of complications like delayed hemorrhage, urinary retention, fissure, and incontinence, while recurrence was more common in the OH group (32% vs. 16%). Infection rates were equal.

- Patient satisfaction at 3 months post-op was higher in the OH group (80%) than the LHP group (68%), possibly due to patient expectations and symptom resolution. Recurrence was lower in the LHP group, supporting its potential for long-term benefit.

- While LHP is a promising minimally invasive technique, OH remains more cost-effective and practical for routine use in rural centers due to equipment limitations, cost, and availability of trained personnel.

Limitations

- The study included only 50 patients, limiting statistical power and generalizability. Larger multicentric trials are needed to validate these findings.
- Patient outcomes were evaluated primarily over a 3-month period. Longer-term follow- up would provide more robust data on recurrence, satisfaction, and complications.
- Variability in surgeon experience with LHP likely influenced operative outcomes, particularly complications and pain control.
- Use of verbal descriptor scales (VDS) for pain may lack the granularity of tools like the visual analog scale (VAS), potentially underestimating subtle differences.
- While feasibility was discussed, no formal cost-benefit analysis was performed, which is crucial for evaluating LHP's long-term utility in rural health systems.
- A higher proportion of Grade 3 cases were treated with OH, potentially skewing complication and satisfaction comparisons.

Conclusion:

This study offers a comprehensive comparative evaluation of laser hemorrhoidoplasty (LHP) and open hemorrhoidectomy (OH) in the treatment of symptomatic Grade I to III hemorrhoids, with a particular emphasis on how these procedures perform within the constraints and realities of a rural medical college

environment where surgical innovations face practical, cultural, and infrastructural challenges. Conducted on a cohort of fifty patients equally divided between the two procedures, the study sought to analyze and contrast the techniques with respect to operative duration, postoperative pain, complications, recovery period, recurrence rates, and patient satisfaction, all of which are clinically relevant and operationally significant in resource-limited settings. Both LHP and OH achieved the primary goal of symptom relief, affirming their roles in modern proctologic surgery; however, distinct differences emerged in qualitative recovery experience, complication patterns, and durability of surgical results. Operative time averaged 56.84 minutes for LHP and 58.44 minutes for OH, a statistically insignificant difference that diverges from published literature frequently citing shorter LHP times due to its minimally invasive nature and reduced tissue dissection. In our rural context, the absence of a time advantage for LHP likely stems from a combination of factors, including the learning curve associated with laser technology, its relatively infrequent application, delays linked to equipment setup and calibration, and team unfamiliarity with laser-specific protocols, all of which reduced efficiency and counterbalanced theoretical gains. Regarding postoperative pain, both groups showed similar distributions across mild, moderate, and severe categories, with no statistically significant difference, suggesting that pain outcomes are influenced not only by surgical technique but also by patient-specific thresholds, analgesic accessibility, subjective reporting accuracy, and the surgeon's intraoperative precision. This finding contrasts with studies positioning LHP as less painful and underscores the need for standardized pain assessment and management protocols, especially in rural settings where opioid access is limited and non-pharmacological measures are rarely integrated into recovery plans. Complication rates revealed a more nuanced divergence: LHP patients experienced higher incidences of delayed hemorrhage (16%), anal fissures or ulcers (16%), urinary retention (12%), and anal incontinence (20%), compared to lower frequencies in OH. This pattern suggests that the apparent technical simplicity of LHP can be misleading, as laser application demands precision in energy settings, fiber tip placement, and tissue targeting; deviations from optimal technique risk thermal injury, incomplete coagulation, or collateral tissue damage, all of which can heighten morbidity. Conversely, recurrence rates favored LHP (16%) over OH (32%), indicating that despite its complications, LHP may provide a more durable resolution when executed well. Recovery durations were closely aligned—3–5 days for LHP and 2–4 days for OH—contrary to reports of earlier discharge and faster return to activities with LHP, likely a reflection of conservative discharge norms in rural hospitals, logistical barriers to follow-up, and the inclination to monitor patients longer in the event of complications. Patient satisfaction at three months was notably higher for OH (80%) than for LHP (68%), an inversion of trends in urban or high-resource studies, which may be explained by deep-rooted cultural trust in OH, its visibility as a "complete" procedure through tissue excision, and the perception of thoroughness it conveys. In contrast, the novelty of LHP, coupled with unmet expectations and a higher rate of minor but bothersome complications, may have dampened patient enthusiasm despite lower recurrence rates. This highlights the role of preoperative counseling and expectation management in surgical innovation, ensuring that patients understand not just potential benefits but also realistic limitations. Cost considerations also shape the rural preference: LHP demands significant capital investment in laser equipment, specialized consumables, and ongoing maintenance, while OH relies on inexpensive, universally available instruments and benefits from decades of accumulated surgical expertise. In conclusion, while LHP offers theoretical advantages—lower recurrence, minimal tissue trauma, and potential for reduced pain—its benefits are not inherently guaranteed, particularly in resource-constrained rural settings lacking the training, infrastructure, and standardized perioperative care required to fully realize its potential. OH, though associated with more postoperative pain and higher recurrence, remains a reliable, trusted, and cost-effective mainstay, firmly embedded in local surgical culture and well-supported by the skillsets of rural surgical teams. The broader implication of this study is that surgical innovation in rural contexts must be approached with a framework that prioritizes operational readiness, surgeon proficiency, patient education, and sustainable resource allocation. Investment in structured training programs, collaborative mentorship with urban centers, and targeted infrastructure upgrades will be essential before newer technologies like LHP can match or surpass the consistency and acceptance of traditional techniques in such environments. Ultimately, tailoring

surgical practice to the realities of rural healthcare, rather than attempting to directly replicate urban protocols, will ensure that innovation serves as a genuine improvement to patient care rather than a premature or mismatched intervention.

References:

1. Kapdi SF, Nangare NR, Kshirsagar A. A Comparative Study between Laser Hemorrhoidoplasty and Open Hemorrhoidectomy. Surgical Chronicles. 2020 Jul 1;25(3).
2. Hassan A, El-Shemy GG. Laser hemorrhoidoplasty versus open hemorrhoidectomy in Upper Egypt. Al-Azhar International Medical Journal. 2021 Feb 1;2(2):84-9.
3. Abdelhady WA, Baghdadi MA. Outcome Of Laser Hemorrhoidoplasty Versus Conventional Open Hemorrhoidectomy. Surgical Chronicles. 2022 Jan 1;27(1).
4. Nangare NR, Pardeshi CZ, Langade AD. Laser Surgical and Open Hemorrhoidoplasty: A Comparative Analysis. Journal of Pioneering Medical Sciences. 2023 Jan 1;12(1).
5. M Raslan M, N Mashour A, M Mohammed A, S Khalifa A. Laser hemorrhoidoplasty versus Milligan–Morgan hemorrhoidectomy (short-term outcome). The Egyptian Journal of Surgery. 2024 Oct 1;43(4):1428-34.
6. Hossain MS, Bhuiyan MN, Nahid SM, Anwar SM, Khan HA, Nipa SA. Comparative study of short-term outcome between laser hemorrhoidoplasty and Milligan-Morgan Hemorrhoidectomy. IAHS Medical Journal. 2022;5(2):15-9.
7. Nasr ME, Abdel Mageed AA, Ahmed MF, Abdelshafy AA. Comparitive study between laser hemorrhoidoplasty and conventional open surgical hemorrhoidectomy (Milligan Morgan technique) in 2nd & 3rd degree piles. The Egyptian Journal of Surgery. 2025 Jan 1;44(1):256-63.
8. De A, Roy P. Hybrid digitally guided hemorrhoidal artery ligation with laser hemorrhoidoplasty: Our experience with a new approach to hemorrhoidal disease. International Surgery Journal. 2021 Sep 28;8(10):2968-73.
9. Tümer H, Ağca MH. Comparing outcomes of laser hemorrhoidoplasty and LigaSure hemorrhoidectomy in grade II–III hemorrhoidal disease: a retrospective analysis. ANZ Journal of Surgery. 2023 Jul;93(7-8):1885-9.
10. Maslennikov SV, Maslennikova EA, Maslennikov VS. Experience of differentiated approach to the choice of treatment method for chronic hemorrhoids. Coloproctology. 2015(S1):31a-2.
11. Okasha HH, Pawlak KM, Abou-Elmagd A, El-Meligui A, Atalla H, Othman MO, Abou Elenin S, Alzamzamy A, Mahdy RE. Practical approach to linear endoscopic ultrasound examination of the rectum and anal canal. Endoscopy International Open. 2022 Oct;10(10):E1417-26.
12. Leonardi M, Condous G. How to perform an ultrasound to diagnose endometriosis. Australasian journal of ultrasound in medicine. 2018 May;21(2):61-9.
13. Brown SR, Shorthouse AJ. Anatomy and physiology of anorectal prolapse. InTransanal Stapling Techniques for Anorectal Prolapse 2009 (pp. 19-29). London: Springer London.
14. Kaur H, Ernst RD, Rauch GM, Harisinghani M. Nodal drainage pathways in primary rectal cancer: anatomy of regional and distant nodal spread. Abdominal Radiology. 2019 Nov;44:3527-35.