

EFFICACY OF DIODE LASER IN THE MANAGEMENT OF HEMORRHOIDS, FISSURE IN ANO, AND FISTULA IN ANO: A PROSPECTIVE OBSERVATIONAL STUDY

Jyoti Kumari¹, Dhiraj Khithani², Saumya Singh³, Sanjay Prasad⁴

Received : 07/08/2025
Received in revised form : 16/09/2025
Accepted : 04/10/2025

Keywords:

Hemorrhoids; Fissure in ano; Fistula in ano; Diode laser.

Corresponding Author:

Dr. Jyoti Kumari,

Email: dhirajkhithani21@gmail.com

DOI: 10.47009/jamp.2025.7.5.137

Source of Support: Nil,
Conflict of Interest: None declared

Int J Acad Med Pharm
2025; 7 (5); 711-714



¹Senior Resident, Department of General Surgery, Heritage Institute of Medical Sciences, Varanasi, India.

²Assistant Professor, Department of General Surgery, Heritage Institute of Medical Sciences, Varanasi, India.

³Associate Professor, Department of General Surgery, Heritage Institute of Medical Sciences, Varanasi, India.

⁴Professor, Department of General Surgery, Heritage Institute of Medical Sciences, Varanasi, India.

ABSTRACT

Background: Hemorrhoids, fissures and fistulas continue to have a significant impact on lives of patient, their management has been a challenge. Diode LASER technology is a highly advanced and effective form of LASER technology used in India. With its highly precise and targeted beam of light, is used to reduce pain, swelling, and bleeding, as well as to eliminate or reduce the size of hemorrhoids. This advanced laser technology provide less pain and maximum recovery in short period of time, so that the post operative stay is reduced and back to work in shorter time. Objective- present study aimed to evaluate the efficacy of diode LASER in treatment of patients with hemorrhoids, fissure in Ano and fistula in Ano. **Materials and Methods:** This Prospective observational study conducted in Tertiary care Centre at Department of General Surgery, HIMS, Varanasi, Uttar Pradesh. Total 116 patients of age >18 years of both genders presenting with hemorrhoids grade 1 to 3, fistula in ano, fissure in ano were included. **Result:** Pain at 24 hours post operatively, 106 patients had no pain, 7 patient had mild to moderate pain. Post Operative complication like itching and oedema at surgical site, bleeding, stenosis, fecal incontinence and recurrence was assessed till 6 months. Complain of Mild bleeding seen in 10 patients (8.62%) within 5 days of surgery and 2 patients of fistula in ano had recurrence that occurs within a week of surgery. No other complications were observed at 6 months follow up. **Conclusion:** Diode Laser surgery is very good minimal invasive surgical method. On the basis of our study we conclude that diode laser surgeries has less intra operative time, which also reducing the duration of time that the patient is exposed to anesthesia, safe, minimally invasive, produces minimal post operative pain, which in turn reduces the requirement for postoperative analgesia, minimal bleeding, short hospital stay and early return to normal routine activities.

INTRODUCTION

Benign anorectal diseases such as hemorrhoids, fissure-in-ano, and fistula-in-ano are among the most frequent conditions encountered in surgical practice, often presenting with pain, bleeding, discharge, and impaired quality of life. Conventional surgical procedures, including hemorrhoidectomy, lateral internal sphincterotomy, and fistulotomy, though effective, are frequently associated with postoperative pain, longer hospital stay, delayed return to work, and complications such as incontinence and recurrence.^[1,2] These limitations

have driven the development of minimally invasive, sphincter-preserving modalities.

Diode laser has emerged as an effective tool in proctology because of its precise tissue ablation, reduced collateral damage, and haemostatic effect. In fistula-in-ano, the FiLaC™ (Fistula Laser Closure) technique has been reported to achieve primary healing rates of around 67–70% with negligible impact on continence.^[3] A prospective Egyptian study on 69 patients undergoing diode laser FiLaC demonstrated a 74% success rate, minimal postoperative pain, and rapid return to daily activities.^[4] Similarly, in chronic anal fissure, laser therapy has been shown to achieve significant pain

reduction, faster healing, and low recurrence with preservation of continence.^[5]

In hemorrhoid disease, diode laser hemorrhoidoplasty offers several advantages compared to open hemorrhoidectomy, including reduced pain, shorter operative time, less blood loss, and early resumption of normal activities.^[6] Collectively, these findings highlight diode laser as a safe and effective modality across different anorectal conditions. However, there remains limited prospective data, particularly from the Indian subcontinent, simultaneously evaluating its role in hemorrhoids, fissure-in-ano, and fistula-in-ano.

Objective: The present study was designed to evaluate the efficacy, safety, recurrence, and patient satisfaction of diode laser treatment in hemorrhoids, fissure-in-ano, and fistula-in-ano in a tertiary care teaching hospital over a 6-month follow-up period.

MATERIALS AND METHODS

This prospective observational study was conducted in the Department of General Surgery, Heritage Institute of Medical Sciences, Varanasi, Uttar Pradesh, over a period of 1.5 years from December 2022 to May 2024. Adult patients aged above 18 years presenting to the Surgery OPD with first, second, or third-degree hemorrhoids, chronic fissure-in-ano, or perianal fistula were included in the study, while patients with fourth-degree hemorrhoids, inflammatory bowel disease involving the rectum or anus, previous anorectal malignancy, or prior surgery for anorectal disease were excluded. Convenience sampling was used, and the sample size was calculated using the formula $N = Z^2PQ/e^2$ ($Z=1.96$, $P=0.77$, $Q=0.23$, $e=0.08$), yielding a minimum of 106 patients; after accounting for a 10% dropout rate, the final sample size was 116. Data were collected using a structured proforma, and outcomes assessed included postoperative pain using the Visual Analog Scale (VAS, 0–10) at 24 hours, 3 days, 7 days, 1 month, 2 months, and 6 months; postoperative complications such as bleeding, edema, itching, incontinence, and stenosis; recurrence within 6 months; and patient satisfaction, which was recorded at discharge and again at 6-month follow-up. Ethical clearance was obtained from the Institutional Ethics

Committee, and informed consent was taken from all participants. Detailed clinical history, examination findings, and investigations including CBC, PT/INR, and viral markers were recorded, and all patients underwent spinal anesthesia. Data were entered into MS Excel and analyzed using SPSS version 26. Demographic and clinical variables were summarized as mean $\pm$ standard deviation, proportions, and percentages. Associations between categorical variables were analyzed using the Chi-square test, correlations were assessed using Pearson's correlation, and a p-value of <0.05 was considered statistically significant.

RESULTS

A total of 116 patients were included, with a mean age of 40.6 ± 15.3 years (range 18–75 years). The majority were in the 20–30 years age group. There was a male predominance (73.3% males vs. 26.7% females). Constipation was a common associated factor (93.1%). Co-morbidities were present in 13.8%, mainly hypertension and diabetes. [Table 1] On clinical assessment, hemorrhoids were the most frequent diagnosis (69.8%), followed by fissure in ano (16.4%) and fistula in ano (13.8%). Five patients had combined pathology. The most commonly performed procedure was laser hemorrhoidoplasty (69.0%), followed by laser sphincterotomy (14.7%) and laser fistulotomy (12.1%); combined procedures were required in 4.2% of cases. [Table 2] Postoperative pain was minimal. At 24 hours, 91.4% patients reported no pain, while only 2.6% had moderate pain. Beyond 3 days, pain was negligible, except in two patients with fistula recurrence. [Table 3] Complications were rare. Mild bleeding occurred in 8.6% of patients, usually within 5 days after passing hard stool. Recurrence was observed in 2 cases (1.7%) of fistula in ano. Importantly, no cases of anal stenosis or incontinence were noted during 6 months of follow-up. [Table 4] Hospital stay was short; 67.2% were discharged the same day, and the rest within 2 days. Most patients resumed routine activity within 1–4 days. Overall, 98.3% of patients were satisfied, while 2 patients expressed dissatisfaction due to recurrence. [Table 5]

Table 1: Demographic Profile of Patients (n=116)

Variable	Findings
Mean Age (years)	40.6 $\pm$ 15.3 (range 18–75)
Most Common Age Group	20–30 years
Gender	Male: 85 (73.3%), Female: 31 (26.7%)
Constipation	108 (93.1%)
Co-morbidities	Present in 16 (13.8%) – HTN (6.9%), T2DM (3.5%), Asthma/others (3.4%)

Table 2: Disease Distribution and Operative Procedures

Diagnosis	Frequency (%)	Procedure Performed	n (%)
Hemorrhoids	81 (69.8)	Laser Hemorrhoidoplasty (LH)	81 (69.0)
Fissure in ano	19 (16.4)	Laser Sphincterotomy (LS)	17 (14.7)
Fistula in ano	16 (13.8)	Laser Fistulotomy (LF)	14 (12.1)
Combined pathology	5 (4.3)	LH+LS or LH+LF	5 (4.2)

Table 3: Postoperative Pain (VAS Score)

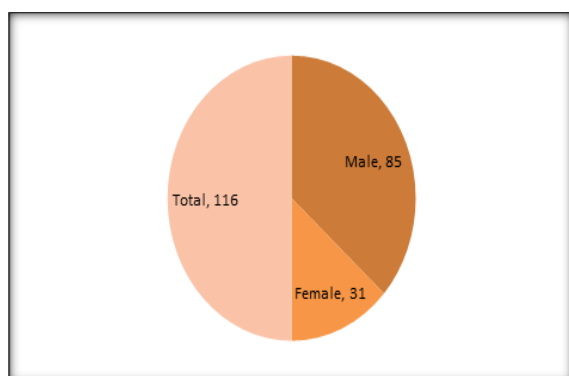
Time Interval	No Pain (0)	Mild (1–3)	Moderate (4–7)	Severe (8–10)
6 hours	44 (37.9%)	27 (23.3%)	45 (38.8%)	0
24 hours	106 (91.4%)	7 (6.0%)	3 (2.6%)	0
Day 3–6 months	114 (98.3%)	0	2 (1.7%)*	0

Table 4: Complications and Recurrence

Complication	Frequency (%)
None	106 (91.4)
Mild bleeding (≤ 5 days)	10 (8.6)
Anal stenosis	0
Incontinence	0
Recurrence (fistula)	2 (1.7)

Table 5: Hospital Stay and Patient Satisfaction

Outcome	Findings (%)
Hospital Stay – 1 day	78 (67.2)
Hospital Stay – 2 days	38 (32.8)
Return to activity	Within 1–4 days
Patient satisfaction	114 (98.3) satisfied; 2 (1.7) not satisfied (due to recurrence)

**Figure 1: Gender Distribution**

DISCUSSION

This prospective study assessed the role of diode laser in the management of hemorrhoids, fissure in ano, and fistula in ano. The results demonstrate that diode laser surgery is safe, minimally invasive, and associated with excellent postoperative outcomes. Laser techniques have been shown to offer advantages over conventional methods by providing precise tissue ablation, minimal collateral damage, and effective hemostasis.^[7,8] In our series, the majority of patients experienced no or minimal pain within 24 hours, which supports earlier reports that diode laser reduces postoperative discomfort by sealing nerve endings and minimizing tissue trauma.^[7,8]

The complication rate was very low, with only mild bleeding in 8.6% of patients. Recurrence occurred in 1.7% of fistula cases, likely due to missed internal openings or secondary tracts, a finding also noted in other studies.^[9,10] Importantly, no anal stenosis or incontinence was reported during six months of follow-up, highlighting the sphincter-preserving effect of the 1470 nm diode laser, which provides optimal tissue penetration of 2–3 mm.^[11,12]

Hospital stay and recovery were significantly reduced; two-thirds of patients were discharged on the same day, and most resumed normal activity

within 1–4 days. Similar outcomes have been reported in other laser studies, emphasizing the benefits of shorter operative time, reduced anesthesia exposure, and faster return to work.^[13,14]

Patient satisfaction was very high (98.3%), consistent with prior evidence that laser procedures achieve superior postoperative comfort and acceptance.

CONCLUSION

Diode laser surgery proved to be a highly effective and minimally invasive technique for the management of hemorrhoids, fissure in ano, and fistula in ano. The procedure was associated with minimal postoperative pain, negligible complications, short hospital stay, and early return to daily activity, resulting in high patient satisfaction. The sphincter-preserving effect of the 1470 nm diode laser minimizes the risk of incontinence or stenosis, making it a safe alternative to conventional surgery. However, recurrence in a small proportion of fistula cases highlights the importance of meticulous identification of internal openings and tracts. While our findings strongly support the use of diode laser in benign anorectal conditions, larger multicenter studies with longer follow-up are recommended to validate its long-term efficacy and cost-effectiveness.

REFERENCES

1. Bouchard D, Abramowitz L, Castinel A, Suduca JM, Staumont G, Sénéjoux A, et al. One-year outcome of haemorrhoidectomy: a prospective multicentre French study. *Colorectal Dis.* 2013;15(6):719–26.
2. Nyström PO, Qvist N, Raahave D, Lindsey I, Mortensen N, Buntzen S, et al. Randomized clinical trial of symptom control after stapled anopexy or diathermy excision for haemorrhoid prolapse. *Br J Surg.* 2010;97(2):167–76.
3. Wilhelm A. A new technique for sphincter-preserving anal fistula repair using a novel radial emitting laser probe. *Tech Coloproctol.* 2011;15(4):445–9.
4. Mohamed M, Magdy A, Mostafa A, Mounir A. Fistula laser closure (FiLaC) for treatment of anal fistula: a prospective study. *Egypt J Surg.* 2023;42(3):558–64.

5. Trindade EN, Trindade MRM, Pandolfo CL, Cerski CT, Nascimento DSB, Souza JC, et al. Use of laser for the treatment of anal fissure: Results of a prospective clinical trial. *Rev Col Bras Cir.* 2021;48:e20202767.
6. Aly A, Mahmoud A, Tarek A, Magdy A. Outcomes of diode laser haemorrhoidoplasty in comparison with conventional haemorrhoidectomy: a randomized controlled trial. *Egypt J Surg.* 2023;42(3):543–50.
7. Hussein BG, Azzawi JI, Hussein RA. Diode Laser & Conventional Surgery Treatment, A Comparative Study in Anal Diseases. *Medico-Legal Update.* 2020 Jan 1;20(1).
8. Mike W. Andrew. The many advantages of laser surgery over Traditional Surgery. *Go Articles.* 2010.
9. Varadarajan MS, Sony PS, Anandan H. Prevalence and clinical presentation of Fissure-In-ANO in a tertiary care centre. *Int J Scientific Study.* 2018;5(12):70
10. Nelson RL, Abcarian H, Davis FG, Persky V. Prevalence of benign anorectal disease in a randomly selected population. *Diseases of the colon & rectum.* 1995 Apr;38:341–4.
11. Dederich DN. Laser/tissue interaction: what happens to laser light when it strikes tissue?. *Journal of the American Dental Association* (1939). 1993 Feb 1;124(2):57-61.
12. Pirnat S. Versatility of an 810 nm diode laser in dentistry: an overview. *J Laser Health Acad.* 2007;4(2):1-9.
13. Sultan SH, Kamal ZB, Al-Atroschi MA, Al-Fayadh R, Hussein WA. Is co2 laser Hemorrhoidectomy superior to conventional open Hemorrhoidectomy?. *AL-Kindy College Medical Journal.* 2010 Jun 30;6(1):4-10. 81
14. . Mohammed MK. Interstitial Photocoagulation of Low Anal Fistula using 810 nm Diode Laser: Prospective Study. *Iraqi Journal of Laser.* 2004 Dec 15;3(B):43-50.