

OUTCOMES OF LASER HEMORRHOIDOPLASTY IN THE TREATMENT OF SYMPTOMATIC HEMORRHOIDS AT SAIDU GROUP OF TEACHING HOSPITAL

Dr. Hunain¹, Dr Mahboob Ahmad Khan², Dr Shamsher Ali³, Dr. Inayatullah⁴,
Dr Adnan Badar⁵.

¹Assistant professor general surgery, SCD saidu sharif.

²Demonstrator anatomy department SCD saidu sharif.

³Medical officer general surgery, SGTH saidu sharif.

⁴Professor Anatomy, SCD saidu sharif.

⁵Associate Professor Anatomy, Saidu Medical College, Swat

*¹dochunain123@gmail.com

ABSTRACT

Purpose of study: Common surgical approaches to the management of hemorrhoid disease such as hemorrhoidectomies are with severe postoperative pain and it takes prolong recovery time. Our study is aimed to perform laser hemorrhoidoplasty (LHP) in patients with symptomatic hemorrhoid disease that did not respond to conservative management in population of Malakand division Pakistan.

Methods: In our study 60 patients with 3rd and 4th degree hemorrhoids were prospectively included for LHP. Outcomes such as Postoperative pain, early return to work, and quality of life were compared with standard Milligan-Morgan hemorrhoidectomy and follow up was done at 7th day, 1 month and 6 months.

Results: The LHP group had significantly lower mean predicted pain scores on days 1 and 2 and lower defecation pain scores and lower analgesia use on days 1 and 2 and followed up visits. Out of 60 patients 61.7% patient have no pain while 35% patient had mild pain which relieved with paracetamol and while negligible number of patient (1.7%) have moderate to severe pain. The median time to return to normal function was significantly lower in the LHP group (2 days vs. 9 days for open hemorrhoidectomy). Similarly, the median days to return to the workplace was significantly lower in the LHP group (3 days vs. 13 days for open hemorrhoidectomy). During follow-up (6 months), symptoms of the patient and all Quality of life were improved significantly, among those with 3rd and 4th degree hemorrhoidal disease.

Conclusion: This study demonstrates decreased pain scores, early return to work and better quality of life with this innovative procedure in the population of Malakand division which indicates that laser hemorrhoidoplasty can be used as better alternative of standard Mulligan Morgan hemorrhoidectomy.

Keyword: Hemorrhoids, Laser, Hemorrhoidoplasty, Hemorrhoidectomy.

INTRODUCTION

Hemorrhoid is a common surgical disease, with a worldwide prevalence of up to 27.9%¹ and also a major portion of surgical patients in Pakistan. It is estimated that more than 50% of the patient with hemorrhoids will experience symptoms from hemorrhoids in their life^{3,4}.

The Research of Medical Science Review

The management of hemorrhoidal disease depends upon the grading and symptoms. Grade I and II hemorrhoidal disease are usually managed conservatively and grade III and IV hemorrhoidal disease are managed surgically. The gold standard procedure is Milligan Morgan hemorrhoidectomy⁵. However, hemorrhoidectomy is associated post op pain, urinary retention, anal fissure and stenosis⁶.

Other non-excisional managements such as band ligation and sclerotherapy are associated with pain, sepsis and high recurrence rates. Although different surgical procedures have been adopted for the treatment of hemorrhoid disease but the primary concern for the patient and for the surgeon is post-operative pain which often results in decrease quality of life and early return to work for those patients who undergo such procedures⁷.

In the management of hemorrhoids, the use of laser was first introduced 32 years back⁷ but proper utilization of laser for hemorrhoids is started recently. A laser hemorrhoidoplasty (LHP) involves 1 mm stab at the base of hemorrhoid at the mucocutaneous junction through which the hemorrhoidal tissue is coagulated using the conical laser fiber. Laser having wave length of 1470 nanometer(nm) and power of 10 watts is used at our setup for this procedure. A hemorrhoidal laser procedure utilizes a Doppler ultrasound probe to identify the terminal branches of the superior rectal artery, or the artery can be palpated and then targeted via laser to coagulate the feeding vessels and hemorrhoidal cushion.

Laser treatment universally reported low postoperative pain scores as well as satisfactory symptom relief and recurrence rates on long-term follow-up⁸. Along with symptomatic relief, QoL and early return to work is also enhanced.

The author is presenting the study investigating the experience of patients who underwent LHP in Malakand division of Pakistan that's had failed conservative management. The primary outcomes are to assess severity and duration of postoperative pain using a visual analog scale on 7th day, early return to work and compare this to patients who underwent a traditional Milligan-Morgan hemorrhoidectomy. Secondary outcomes are to objectively assess severity of hemorrhoidal symptoms and their effect on patients' quality of life (QoL) after 7 days, 1 month and 6 months. We observed that LHP has a rapid and less painful recovery as compared to traditional hemorrhoidectomy and has comparable clinical outcomes in controlling symptoms of hemorrhoidal disease on long-term follow-up.

Research method:

Study design:

In this cohort study (perspective) at Saidu group of teaching hospital saidu sharif swat Pakistan, we recruited 60 patients with symptomatic hemorrhoidal disease between January 2024 to August 2024. The cohorts were not stratified by grade of hemorrhoid as it is known that there is no correlation between the grade of hemorrhoid and severity of symptoms^{9,10}. Consecutive patients who presented to the clinic with symptomatic hemorrhoids were clinically assessed and, with informed consent, recruited to the LHP group. Comparative group, who underwent a traditional Milligan-Morgan hemorrhoidectomy at general surgery department saidu group of teaching hospital, was in the trial.

We compared the outcomes of LHP and hemorrhoidectomy patients using a 2-sided t-test for continuous variables and Fisher exact test for categorical variables. The outcomes, measured using a 10-day postoperative questionnaire, were as follows: daily pain, defecation pain were measured using a visual analog scale; analgesic use measured by using daily analgesics for pain in 24 hours; and early return to work (measured in days). These were recorded in a 10-day patient questionnaire and returned to the surgeon at the routine 11th day postoperative clinical review.

Procedure:

The procedure was performed under general anesthesia or saddle block in lithotomy position. Anoscope was used to visualize the hemorrhoidal pedicles. The laser fiber was fixed in 14 G introducer sheath. The anoderm adjacent to the hemorrhoidal pedicle is stabbed under vision with conical fiber and fiber was introduced up to the main pedicle above the dentate line in submucosal plane.

The Research of Medical Science Review

The hemorrhoid tissue was coagulated using a 10-W, 1,470-nm diode laser system by Leonardo mini via 14 G cannula. The laser beam is considered a divergent beam, where the laser energy dissipates and causes no damage to surrounding normal tissue. We aimed to deliver no more than 250 J per hemorrhoid. Pulse mode of cycle with 3 seconds energy delivering with 1 second pause. 3 pulses given just above the hemorrhoidal cushion, next 3 pulses given at the dentate line and 2 pulses are given below the dentate line. (fig 1). A cold wet gauze was compressed against hemorrhoid to reduce swelling. This was repeated for all present hemorrhoid. the residual skin tags were excised using diathermy to the level of the anal verge. A cold pack was placed in the anal canal and removed prior to discharge. All patients were discharged home on same day of the procedure.

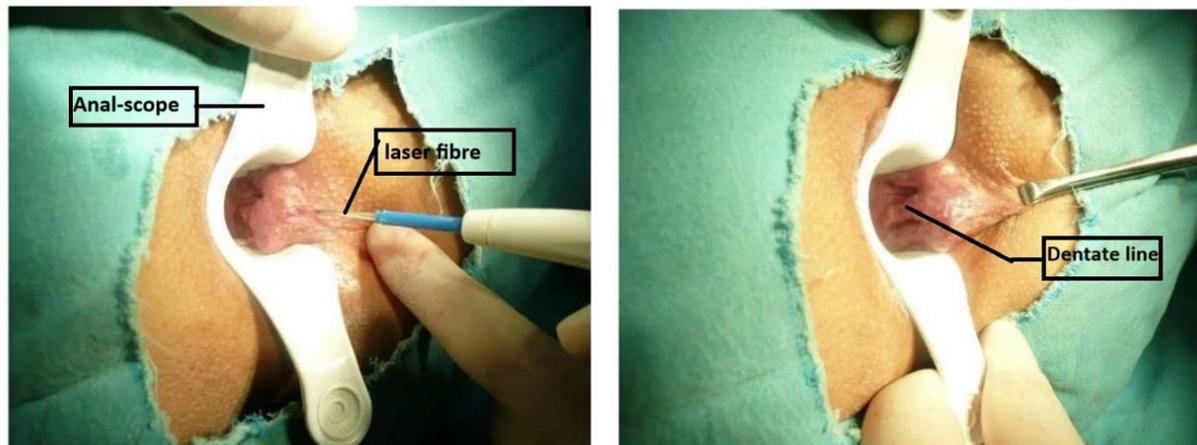


Figure: 1

Patient follow-up:

At day 7th postoperatively patients were followed clinically with digital rectal examination (DRE) only. after one-month patient were followed clinically with DRE and proctoscopy. At sixth month followed for any recurrence or residual hemorrhoid with proctoscopy. In mean time patients were asked to complete a daily pain score and defecation pain score and report any analgesia used. Early return to work was also recorded on this questionnaire. At 6th month, all 60 patients were interviewed to determine incidence of residual symptoms and whether they were satisfied with the procedure or not.

Statistical analysis:

Data were summarized using mean, median (range), and number (%) according to type and distribution. Short-term continuous outcomes (total pain, defecation pain scores, and proportion requiring opioid analgesia) were assessed using the SPSS (2016) and calculating frequency and estimated mean for each outcome over the 7 day period.

RESULTS:

In our study, 60 patients underwent LHP. All the 60 patients were recruited, and all patients completed their postoperative pain questionnaire. Due to post hemorrhoidectomy outcomes available in existing literature, LHP patient data was compared with those studies

The median age in the LHP group was 43.5 years (range, 32–88 years) and were female patients. This group had no smokers, with 4 patients on oral anticoagulation (withheld perioperatively). 9 patients (15%) had a history of previous hemorrhoid procedures. The median of the grade of hemorrhoids was III (range, II–IV) and without significant comorbidities. Baseline characteristics are further presented in Table 1.

Characteristic	Laser hemorrhoidoplasty group (n=60)
----------------	--------------------------------------

The Research of Medical Science Review

Characteristic	Laser hemorrhoidoplasty group (n=60)
Age (yr)	43.5 (32–88)
Female sex	60 (100%)
Smoking status	0 (0%)
Anticoagulation	4 (6.6%)
Previous hemorrhoid surgery ^a	9 (15%)
Grade of hemorrhoids	
I	0 (0)
II	10 (16.6)
III	32 (53.4)
IV	18 (30)
No. of hemorrhoids	
1	0 (0)
2	14(23.4)
3	42 (66.7)
4	4 (6.7)

Table 1

The mean procedure time of the laser procedure was 19.8±4.9 minutes (range, 10–32 minutes), average total laser energy used per patient was 611.3±117.8 J (range, 217–988 J). Additionally, 36 patients (60%) underwent a mucopexy and 5 patients (8.3%) had concurrent skin tag removal.

In LHP group in study 55 patient (91.7%) does show no bleeding during surgery and post-operative follow-up while 4 patients (6.7%) only presented mild bleeding which subsided with dressing. 1 patient (1.7%) have presented with hematoma on 3rd post off day and need drainage of the hematoma under local anesthesia as mention in table 2.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid no bleeding	55	91.7	91.7	91.7
mild bleeding	4	6.7	6.7	98.3
Haematoma	1	1.7	1.7	100.0
Total	60	100.0	100.0	

Table 2. (post_op_bleeding)

Pain was assessed using visual analog score and was recorded on a proforma at 1st post opp day , 7th post op day and 6 month duration.37 patients (61.7%) were have no pain or just itching sensation post operatively. 21 Patients (35%) were complaining of having mild and were treated effectively with paracetamol only. Only 1 patient (1.7%) was having severe pain and was treated with opid analgesic for 3 days post operatively. 1 patient was have complain of severe pain post operatively and the cause was hematoma which

The Research of Medical Science Review

needed to shift patient to OT and pain was subsided by drainage of the hematoma. One patient presented to hospital with a thrombosed hemorrhoid on day 10, which was managed conservatively with analgesia and ice packs. Table3

There were no perioperative complications. Any intraoperative bleeding from the laser tract was easily controlled with diathermy. Importantly, patients who were on anticoagulation did not present with delayed bleeding on re starting of their blood thinners.

The incidence of postoperative infection, urinary retention, and return to theatre within 30 days was 0.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid no pain	37	61.7	61.7	61.7
mild pain	21	35.0	35.0	96.7
moderate pain	1	1.7	1.7	98.3
severe pain	1	1.7	1.7	100.0
Total	60	100.0	100.0	

Table 3 (Pain)

In Long-term outcomes A summary of the raw median data for hemorrhoidal symptom-related QoL is presented in table 4 in form of Short Health Scale score which present the value in median(range) of values of all the parameter mention in table 4. At 3 and 6 months postoperatively, all symptoms and QoL measures showed improvements. At both 3 and 6 months postoperatively, patients reported a statistically significant improvement in all hemorrhoidal symptoms and associated QoL measures post-LHP. (Table 4)

Variable	Short Health Scale score		
	Preoperative (n=60)	After 3 mo (n=60)	After 6 mo (n=60)
Hemorrhoid symptom			
Pain	2.0 (0-4)	0 (0-4)	0 (0-4)
Itch/discomfort	2.5 (1-4)	0 (0-4)	0 (0-4)
Bleeding	2.0 (0-4)	0 (0-4)	0 (0-4)
Soiling	0 (0-4)	0 (0-4)	0 (0-4)
Feeling of swelling	3.0 (0-4)	0 (0-4)	0 (0-4)
Quality of life			
Severity of symptoms	4 (1-4)	1.0 (1-4)	1.0 (1-4)
Interference with daily activities	3.5 (1-4)	1.0 (1-4)	1.0 (1-4)
Affect wellbeing	3.0 (1-6)	2.0 (1-6)	2.0 (1-6)

Table 4. Outcomes of 3 and 6 months after operation in the laser hemorrhoidoplasty group (Values are presented as median (range).note for table 4: "For hemorrhoid symptoms: 0, never; 1, less than once a month; 2, less than once a week; 3, 1-6 days per week; 4, every day. For quality-of-life symptoms: 1, no symptoms; 7, severe symptoms)

Discussion:

This study evaluated the outcomes of postoperative bleeding, pain and return to function and work in patients with symptomatic hemorrhoids who underwent laser hemorrhoidoplasty at saidu group of teaching

The Research of Medical Science Review

hospital in the population of Malakand division. This study demonstrated that LHP is feasible with acceptable short- and long-term outcomes, in particular low pain scores and decreased recovery period.

The ideal choice of treatment for hemorrhoidal disease is not easy job to be decided. A traditional hemorrhoidectomy is considered to be the gold standard and allows complete remission of hemorrhoidal disease with recurrence estimated to be 2% to 16% for grade II to IV hemorrhoids at 1 year; however, it is a painful in postoperative duration^{11,12}. Therefore, we are always looking for alternative procedure with similar clinical outcome, but with less postoperative pain.

According to Literature LHP is more suitable for grade II and III hemorrhoid and has low recurrence rate¹³. A study by Longchamp et al¹³. highlights that the recurrence rate of hemorrhoids after LHP ranges from 0% to 11.3% after 1 year. Our study highlights a similarly low rate of recurrence at 25.0% (3 of 12) for those with grade II and III hemorrhoids at 1 year. A study by Maloku et al¹⁴. in 2014 highlights that LHP is equally efficacious to surgical hemorrhoidectomy at a 1-month follow-up. Therefore, as LHP has shown to have minimal intraoperative complications, and low rates of recurrence for those with grade II, III and IV hemorrhoids, this procedure is likely to be safe in moderate hemorrhoidal disease and this pilot study may guide larger clinical trials in Australia¹⁵.

A study of 121 patients in 2019¹⁶, comparing LHP with mucopexy and open hemorrhoidectomy found that LHP was significantly less painful than excisional hemorrhoidectomy ($P < 0.001$) and associated with earlier return to regular activity (15 days vs. 30 days, $P < 0.001$). Similar to our study, they utilized a 1,470-nm diode laser with similar amounts of energy delivered per hemorrhoid. While in our study early return to regular activity and return to work was decreased (mean value of 3rd post op day) as compared to above mentioned study²⁰.

Significant complications such as pain and bleeding after LHP are uncommon. The occurrence of skin tags is reported in up to 5 out of 60 (8.3%) patients after LHP in our cohort. Skin tags may form in patients secondary to the inflammatory response from the heat energy. These residual tags make it difficult for patient to maintain to maintain anal hygiene and require subsequent excision.

Our sample of participants undergoing LHP are all females in LHP group and the comparative Milligan-Morgan hemorrhoidectomy group (81.4% of women). A New Zealand cross-sectional study by Xia et al¹⁷. in 2020 of over 45,000 participants identifies that the incidence of hemorrhoids in women is 4% less than in men. As these proportions may therefore not be reflective of the general population, our sample may be more reflective of the local demographic of our institution and may have the potential for bias and is a limitation of the small-sampled feasibility study.

This is the first pilot study to trial laser techniques in the use of symptomatic hemorrhoidal disease in the population of Malakand division and the results have corroborated the international experience, with decreased pain and analgesia use, earlier return to function and the workplace, and clinically efficacy on long-term follow-up.

This study demonstrates low pain scores with this revived procedure in the population of Malakand division, demonstrating the safety of the use of LHP in symptomatic hemorrhoidal disease. LHP resulted in significantly lower pain scores, defecation pain scores, and opioid analgesia use in the early postoperative period. Additionally, there was statistically significant symptom resolution and improvement in symptom-related patient QoL on long-term follow-up. Further head-to-head studies comparing LHP to other hemorrhoid therapies with larger sample sizes and the utilization of objective postoperative symptoms scores are required to determine the most efficacious therapeutic approach for this common condition.

Conclusion:

This study demonstrates decreased pain scores, early return to work and better quality of life with this innovative procedure in the population of Malakand division which indicates that laser hemorrhoidoplasty can be used as better alternative of standard Mulligan Morgan hemorrhoidectomy

Author contributions

DR Hunain: concept and design of study, collection of data and statistical analysis

The Research of Medical Science Review

Dr Mahboob Ahmad Khan: writing of main script, critical review of main script.

Dr Shamsheer: analysis of data and data collection

Dr Inayatullah: data collection and writing of main script

Dr Adnan badar: analysis of data and data collection

All authors read and approved the final manuscript

REFERENCES:

- Johanson JF, Sonnenberg A. The prevalence of hemorrhoids and chronic constipation: an epidemiologic study. *Gastroenterology*. 1990;98:3806.
- Nelson RL, Abcarian H, Davis FG, Persky V. Prevalence of benign anorectal disease in a randomly selected population. *Dis Colon Rectum*. 1995;38:3414.
- Rivadeneira DE, Steele SR, Ternent C, Chalasani S, Buie WD, Rafferty JL, et al. Practice parameters for the management of hemorrhoids (revised 2010) *Dis Colon Rectum*. 2011;54:1059–64.
- Gallo G, Realis Luc A, Clerico G, Trompetto M. Diathermy excisional haemorrhoidectomy: still the gold standard: a video. *Colorectal Dis*. 2018;20:1154–56.
- Bleday R, Pena JP, Rothenberger DA, Goldberg SM, Buls JG. Symptomatic hemorrhoids: current incidence and complications of operative therapy. *Dis Colon Rectum*. 1992;35:477–81.
- Wang JY, Chang-Chien CR, Chen JS, Lai CR, Tang RP. The role of lasers in hemorrhoidectomy. *Dis Colon Rectum*. 1991;34:78–82.
- Lakmal K, Basnayake O, Jayarajah U, Samarasekera DN. Clinical outcomes and effectiveness of laser treatment for hemorrhoids: a systematic review. *World J Surg*. 2021;45:1222–36.
- Peery AF, Sandler RS, Galanko JA, Bresalier RS, Figueiredo JC, Ahnen DJ, et al. Risk factors for hemorrhoids on screening colonoscopy. *PLoS One*. 2015;10:e0139100.
- Davis BR, Lee-Kong SA, Migaly J, Feingold DL, Steele SR. The American Society of Colon and Rectal Surgeons clinical practice guidelines for the management of hemorrhoids. *Dis Colon Rectum*. 2018;61:284–92.
- Rørvik HD, Styr K, Ilum L, McKinsty GL, Dragesund T, Campos AH, et al. Hemorrhoidal Disease Symptom Score and Short Health ScaleHD: new tools to evaluate symptoms and health-related quality of life in hemorrhoidal disease. *Dis Colon Rectum*. 2019;62:333–42. doi: 10.1097/DCR.0000000000001234.
- Shaikh AR, Dalwani AG, Soomro N. An evaluation of Milligan-Morgan and Ferguson procedures for haemorrhoidectomy at Liaquat University Hospital Jamshoro, Hyderabad, Pakistan. *Pak J Med Sci*. 2013;29:122–7. doi: 10.12669/pjms.291.2858.
- Simillis C, Thoukididou SN, Slessor AA, Rasheed S, Tan E, Tekkis PP. Systematic review and network meta-analysis comparing clinical outcomes and effectiveness of surgical treatments for haemorrhoids. *Br J Surg*. 2015;102:1603–18. doi: 10.1002/bjs.9913.
- 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;36:485–96. doi: 10.1007/s10103-020-03142-8.
- Maloku H, Gashi Z, Lazovic R, Islami H, Juniku-Shkololli A. Laser hemorrhoidoplasty procedure vs open surgical hemorrhoidectomy: a trial comparing 2 treatments for hemorrhoids of third and fourth degree. *Acta Inform Med*. 2014;22:365–7. doi: 10.5455/aim.2014.22.365-367.
- Aibuedefe B, Kling SM, Philp MM, Ross HM, Poggio JL. An update on surgical treatment of hemorrhoidal disease: a systematic review and meta-analysis. *Int J Colorectal Dis*. 2021;36:2041–9. doi: 10.1007/s00384-021-03953-3.
- Poskus T, Danys D, Makunaite G, Mainelis A, Mikalauskas S, Poskus E, et al. Results of the double-blind randomized controlled trial comparing laser hemorrhoidoplasty with sutured mucopexy and excisional hemorrhoidectomy. *Int J Colorectal Dis*. 2020;35:481–90. doi: 10.1007/s00384-019-03460-6.

The Research of Medical Science Review

Xia W, Barazanchi AW, Coomarasamy C, Jin J, Maccormick AD, Sammour T, et al. Epidemiology of haemorrhoids and publicly funded excisional haemorrhoidectomies in New Zealand (2007-2016): a population-based cross-sectional study. Colorectal Dis. 2021;23:265–73. doi: 10.1111/codi.15376.

