MAK HILL Publications Research Journal of Medical Sciences

Research Article
doi: 10.59218/makrjms.2024.3.123.128

Laser Haemorrhoidoplasty for 2nd, 3rdand 4th Degree Haemorrhoids: An Observational Study

[1]Diptangshu Das, [2]Arunava Jana and [3]Manojit Barman

[1]FMAS (New Delhi), Observership in Colorectal and HPB Oncological Surgery, at K.P.C Medical College and Hospital, Kolkata, Consultant Surgeon at Kothari Medical Centre, Kolkata, West Bengal 700027, India

[2,3]Department of General Surgery, K.P.C Medical College and Hospital, Kolkata, West Bengal 700032, India

ABSTRACT

The conventional haemorrhoid surgery is being rapidly replaced by the use of laser, mostly in the western countries. India being a developing country the use of laser for diagnosed cases of grade 2, grade 3 and grade 4 haemorrhoid disease is limited to few centers only. Our objective is to study the results of laser Haemorrhoidoplasty in patients diagnosed with grade 2, grade 3 and grade 4 hemorrhoids. This observational study includes the results of diagnosed cases of grade 2, grade 3 and grade 4 haemorrhoidaldisease treated with laser surgery between January 2020 to January 2022, followed by a follow up of 1 year. Written informed consent was taken from all the subjects. All the informations regarding the patients have been randomized and recorded accordingly. Out of the total 140 patients who were included in the study, In with Recurrence, 5 (12.5%) patients had Additional surgical procedure. Association of Additional surgical procedure with Recurrence was not statistically significant (p = 0.6657). In with Recurrence, 5 (27.78%) patients had Grade 2, 9 (50%) patients had Grade 3 and 4 (22.22%) patients had Grade 4. Association of Grade with Recurrence was not statistically significant (p = 0.1169).In with Recurrence, 10 (20.83%) patients had Complication. Association of Complication with Recurrence was statistically significant (p = 0.0229). In with Recurrence, 7 (16.67%) patients had Second LHP. Association of Second LHP with Recurrence was not statistically significant (p = 0.8097).In with Recurrence, 9 (20.45%) patients had Internal Pouch Count 1, 25 (56.82%) patients had Internal Pouch Count 2 and 10 (22.73%) patients had Internal Pouch Count 3. Association of Internal Pouch Count with Recurrence was not statistically significant (p = 0.1287). In with Recurrence, 15 (37.5%) patients had ASA score 1, 20 (50%) patients had ASA score 2 and 5 (12.5%) patients had ASA score 3. Association of Internal Pouch Count with Recurrence was statistically significant (p = 0.0481). In with Recurrence, 18 (37.5%) patients had Asthma/ COPD. Association of Asthma/ COPD with Recurrence was not statistically significant (p = 0.7546). Laser Haemorrhoidoplasty procedure is a reliable for treating all the grade 2, grade 3 and grade 4 haemorrhoidal cases. Asperthis study results, it canbe clearly stated that laser surgery is highly effective for grade 2 and grade 3. For better understanding multicentric, large series studies are needed.

OPEN ACCESS

Key Words

Haemorrhoid, laser Haemorrhoidoplasty, Postoperative Pain and ANUS

Corresponding Author

Arunava Jana,
Department of General Surgery, K.P.C Medical College and Hospital, Kolkata, West Bengal 700032

Author Designation

[1]General Surgery
[2]Assistant professor
[3,4]Post Graduate Resident

Received: 22 November 2023
Accepted: 31 December 2023
Published: 3 January 2024

Citation: Diptangshu Das, Arunava Jana and Manojit Barman, 2024. Laser Haemorrhoidoplasty for 2nd, 3rd and 4th Degree Haemorrhoids: An Observational Study. Res. J. Med. Sci., 18: 123-128, doi: 10.59218/ makrjms.2024.3.123.128

INTRODUCTION

Hemorrhoidal disease (HD) is a prevalent ailment that impacts millions of individuals globally and results in significant disability. Rectal bleeding, soreness, anal irritation and prolapse are the most frequent symptoms, which can have a negative impact on quality of life[1].

There are differing views regarding the best procedure that is the one that is both the most effective and causes the patient the least amount of discomfort despite the fact that HD can be treated using a variety of approaches[2].

A good treatment for HD is conventional excisional hemorrhoidectomy[3] However, excruciating postoperative pain is frequently felt[4].

A non-excisional technique, defined as hemorrhoidal artery ligation, was first described in the 1990s by Mori-naga *et al*.[5]This method relies on surgically ligating the vessels after Doppler guidance has been used to identify and reduce the blood supply to the hemorrhoidal arterie's terminal branches.The hemorrhoidal cushions shrink as a result of the following loss in blood flow, which also causes a decrease in the hemorrhoidal plexus's volume[6].

Recently, a Doppler-guided laser dearterialization method known as the HeLP procedure has been proposed for the terminal branches of the superior hemorrhoidal arteries by Giamundo *et al*.[7].

Our multicenter prospective study set out to report on HeLP outcomes in individuals with absence or mild internal mucosal prolapse and symptomatic second-and third-degree hemorrhoids.

Doctors sometimes refer patients to surgeons for more involved hemorrhoid treatment methods when treating Grade 3 and Grade 4 hemorrhoids. Surgical hemorrhoid excision or surgical hemorrhoid stapling are the two most often used surgical hemorrhoid therapies.

The most popular and usually most successful surgical hemorrhoid treatment is an excisional hemorrhoidectomy. Regretfully, the patient has a tough time recovering because the operation is extremely painful. The majority of patients need a full two weeks to heal. An extremely painful excisional hemorrhoidectomy led to the development of a novel, minimally invasive hemorrhoid treatment method.
Because of where the incision is made, the stapled hemorrhoidectomy surgery is a considerably less painful hemorrhoid therapy. A circular rim of tissue is sliced by a specific device inside the anus, an area devoid of nerve endings. The device holds the tissue together simultaneously by inserting tiny staples. Advocates of the stapled hemorrhoid procedure claim that by cutting a rim of tissue the hemorrhoids' blood supply is cut off and they are raised back into position. However, there are certain hazards associated with this hemorrhoid treatment process. These include the possibility of stapling the rectum to the vagina, injury to the small bowel if the incision is made too high, bleeding, and serious infection. Additionally, a drawback for certain people is that the stapled hemorrhoid treatment process would inevitably leave permanent staples within the rectum.

Hemorrhoidal disease is one of the most common benign anorectal diseases that have a significant impact on patient's life[8]. The hemorrhoids may cause symptoms that are: bleeding, prolapse, itching, soiling of feces, and psychologic discomfort[9]. Surgical treatment has been always the definitive treatment for the previously mentioned lesions, even better than the medical choice[10].

Patients undergoing anal surgical procedures such as hemorrhoidectomy may currently face fluctuating levels of postoperative pain, bleeding and a delayed return to their regular lives and recurrence rate that differs according to the adopted technique and the operator[11].

The laser energy that is most frequently utilized in medicine is Nd YAG, carbon dioxide, argon and diode laser. Depending on the laser strength and length of time applied the laser beam causes tissue shrinkage and degeneration at varying depths. Recently, laser treatment using diode laser is a new minimally invasive and painless procedure and considered as an alternative to the surgical choice and associated with less postoperative pain, less bleeding and early return to normal life[12].

Hemorrhoidal disease is a highly prevalent pathology that considerably lowers people's quality of life. Since hemorrhoidal illness is highly prevalent in the population and hemorrhoidectomy can result in consequences including bleeding, incontinence and anal stenosis that lower quality of life, minimally invasive procedures that cause less difficulties are still in demand.While laser hemorrhoidoplasty (LHP) is the most recent technique available, not much research has been done on it. The LHP is a minimally invasive, less traumatic and safe surgical treatment. As a result, it is described as an effective strategy for treating hemorrhoidal illness[9]. Studies detailing LHP with high short-term success rates in terms of symptomatic improvement and downstaging can also be found in the literature. The same studies also state that there is a high risk of both long-term recurrence and mild post-operative problems with this technique[10].

MATERIALS AND METHODS

Study design: Observational Study.

Study Period: January2020toJanuary 2022.

Place of study: Sample Size: 140.

Inclusion criteria:

- Age more than 18 years old
- Second, third and fourth degrees of hemorrhoids

Exclusion criteria:

- Accompanied anorectal pathology as anal fissure or perianal fistula
- Acutely inflamed thrombosed hemorrhoids
- Patients affected by inflammatory bowel disease affecting the rectum or anus

RESULTS

In with Recurrence, 85 (76.58%) patients had Grade 2 and Grade 3 and 14 (48.28%) patients had Grade 4. Association of Grade with Recurrence was statistically significant (p = 0.0028). Parameters Subgroups Recurrenc.

Additional surgical procedure: In with Recurrence, 5 (12.5%) patients had Additional surgical procedure. Association of Additional surgical procedure with Recurrence was not statistically significant (p = 0.6657).

Grade: In with Recurrence, 5 (27.78%) patients had Grade 2, 9 (50%) patients had Grade 3 and 4 (22.22%) patients had Grade 4. Association of Grade with Recurrence was not statistically significant (p = 0.1169).

Complication: In with Recurrence, 10 (20.83%) patients had Complication. Association of Complication with Recurrence was statistically significant (p = 0.0229).

Second LHP: In with Recurrence, 7 (16.67%) patients had Second LHP. Association of Second LHP with Recurrence was not statistically significant (p = 0.8097).

Internal pouch count: In with Recurrence, 9 (20.45%) patients had Internal Pouch Count 1, 25 (56.82%) patients had Internal Pouch Count 2 and 10 (22.73%) patients had Internal Pouch Count 3. Association of Internal Pouch Count with Recurrence was not statistically significant (p = 0.1287).

ASA score: In with Recurrence, 15 (37.5%) patients had ASA score 1, 20 (50%) patients had ASA score 2 and 5 (12.5%) patients had ASA score 3. Association of Internal Pouch Count with Recurrence was statistically significant (p = 0.0481).

Asthma/COPD: In with Recurrence, 18 (37.5%) patients had Asthma/ COPD. Association of Asthma/ COPD with Recurrence was not statistically significant (p = 0.7546).

Table 1: Visual analog scale descriptive statistics analysis

VAS/time	Mean±SD
VAS post-operative day 1	5.0±0.6
VAS post-operative day 2	2.2±2.6
VAS post-operative month 1	3.2±3.5

DISCUSSIONS

Diode lasers were first used in 20054. Karahaliloğlu introduced ablation using laser devices, dubbed the "LHP procedure"[13]. Anesthesia might be applied locally or regionally for the process. Karahaliloğlu carried out the process while positioned in the lithotomy posture[13]. Diode lasers are less likely than other lasers to harm deep anatomical structures because of their sensitivity and short range7-9.Initially, devices with a wavelength of 980 nm were employed[12]. The fact that 1470 nm devices cause less tissue damage has led to their rise in popularity. We used a 1470 nm diode laser in the lithotomy position for all of our procedures, which were carried out under spinal anesthesia.

Various follow-up durations, recurrence rates, and disease features have all been reported in the literature. Various surgical methods and energy dosages were used in various investigations. This complicates standardization and comparison. For example, using a 980 nm laser, Naderan *et al*.[12] excluded patients with an ASA 3 anesthetic score and Grade 4 illness. According to this study, there was no difference in the risk of recurrence at the 12-month follow-up between Milligan-Morgan (MM) hemorrhoidectomy and laser treatment. Weyand *et al*.[14]employed a 1470 nm laser device, added mucopexy as needed, and monitored 497 patients with grade 2-3–4 illness and an ASA 1-2–3 anesthesia score for a period of six months.Proctological conditions including anal fissures and fistulas were also treated in the same session, and the 8.8% recurrence rate in all patients was explained. Jahanshahi *et al*.[10] reported despite the fact that they used a 980 nm diode laser device, did not apply mucopexy and did not include any further proctologic disorders, there was no recurrence in any patient after a year of follow-up in their publication. This is one of two articles that discuss a rate of 0% recurrence. Brusciano et al. followed patients for an average of 8.6 months, excluding those who had previously undergone surgery for hemorrhoidal illness and had an ASA score of three[15]. Presenting the findings of the study that had the longest follow-up (5 years) in the literature, Faeset al.[16] reported a noteworthy 34% recurrence rate. However, Karahaliloğlu conducted two trials in 2007 and 2010 and found that adding mucopexy to the surgery resulted in a considerable reduction in the recurrence rate, which dropped from 31.2-5.8%. Repetitive sessions in LHP were first mentioned in the literature by Karahaliloğlu[17]. A total of 103 patients were tracked for six to twenty-four months in our series. In our study, all patients with anesthetic ratings of ASA 1-2-3 were included and patients with Grade 4 illness

Table 2: Recurrence, count

	Recurrence, count (%)			
Grade	Yes	No	Total	p-value
Grade 2 and Grade 3	85 (76.58)	26 (23.42)	111 (100.0)	0.0028
Grade 4	14 (48.28)	15 (51.72)	29 (100.0)	

Table 3: Association of grade with recurrence

		Recurrence			
Parameters	Subgroups	No	Yes	p-value	χ^2
		N (%)	N (%)		
Additional surgical procedure	Yes	10 (10)	5 (12.5)	0.6657	0.1866
	No	90(90)	35 (87.5)		
Grade	2	48 (39.34)	5 (27.78)	0.1169	4.2917
	3	32 (26.23)	9 (50)		
	4	42 (34.43)	4 (22.22)		
Complication	No	85 (92.39)	38(79.17)	0.0229	5.1709
	Yes	7 (7.61)	10 (20.83)		
Second LHP	No	80 (81.63)	35 (83.33)	0.8097	0.0579
	Yes	18 (18.37)	7 (16.67)		
History of previous haemorrhoid surgery	No	95 (90.48)	35 (100)	0.0581	3.5897
	Yes	10 (9.52)	0		
Internal Pouch Count	1	29 (30.21)	9(20.45)	0.1287	4.1002
	2	37 (38.54)	25 (56.82)		
	3	30 (31.25)	10 (22.73)		
ASA score	1	60 (60)	15 (37.5)	0.0481	6.0667
	2	30 (30)	20 (50)		
	3	10 (10)	5 (12.5)		
Asthma/ COPD	No	55 (59.78)	30 (62.5)	0.7546	0.0976
	Yes	37 (40.22)	18 (37.5)		

were also treated with LHP. The study also included patients who had extra operations performed because of a skin tag and perianal fissure. The longer the follow-up time the higher our recurrence rates were; nevertheless, this increase was not statistically significant. It is believed that this outcome results from the smaller number of patients who had a 2-year follow-up period. Compared to Grades 2 and 3, our recurrence rates in Grade 4 disease are noticeably greater. Because there was little information in the literature, we did not apply the second session to every recurrence. We did not use any more mucopexy during our surgeries. Application of mucopexy may lower our rates of recurrence when the studie's findings are assessed.

The primary benefit of LHP is that, due to its reduced discomfort, it allows for a prompt return to work. Compared to traditional approaches the post-LHP pain score was shown to be considerably reduced[18]. A publication assessing 341 patients reported that following LHP the period to return to work was brief and the pain score was low[10]. In our investigation the second day showed a considerable drop in pain assessment when compared to the first. One of the main causes of the quick return times to work is also this rapid decline in pain scores.According to a study done in Italy, after surgery, 20 patients (or 40%) resumed their regular activities on the first day, and all patients (or 100%) on the second. The average time for patients in our study to resume their regular daily routines was 2.17 (1-11) days.

According to Weyand *et al*.[14] 91% of patients were extremely satisfied or satisfied with the surgery six months after it had been performed and they recommended having the LHP surgery again. According to our satisfaction surveys, 81.3% of patients at the 12-month mark, 80% at the 24-month mark and 80.6% at the 6-month mark expressed high levels of satisfaction. As the follow-up time lengthened, recurrences rose correspondingly, although patient satisfaction levels remained constant. This is a consequence of both the disease's grades declining as a result of the pouches contracting and the notable improvement in symptoms like bleeding and prolapse brought on by fibrosis, even though some patients' complaints persist following laser treatment. Since all patients in our analysis who did not entirely recover symptomatically were considered to have had a recurrence, there are some people whose pouches considerably regressed while they still had symptoms. The low complication rates of LHP are an additional benefit. The only problems mentioned by Brusciano *et al*.[15] were edema and little bleeding. Karahaliloğlu *et al*.[13] and Jahanshahi *et al*.[10] indicated a 0.6-0.58% infection rate, respectively. In contrast to previous research, Faeset *et al*.[16] found that 18% of minor problems were related to the operation. In our study, 3 (2.9%) out of 103 participants experienced minor problems. Due to problems, none of our patients needed to have surgery again, and there was no discernible subgroup linked to the occurrence of issues. In a different trial, they found that while the

quantity of energy applied per patient in joules had a substantial impact on postoperative issues, the number of pouches had no effect on the rate of difficulties.

With an ASA score of 3, extra comorbidities, bleeding risk, long-term anticoagulant use, and diabetes, dangerous patients can safely employ LHP due to the low probability of procedure-related complications. Another element that lowers the danger of anesthesia is the brief duration of the procedure. Additionally, there is very little requirement for critical care following LHP. Because of their risky chronic conditions, only 1 (0.97%) patient in our study spent one night in the critical care unit at the recommendation of the anesthetic unit.

The expense of laser devices is one of their main drawbacksp[19]. Giamundoet *et al*.[11]determined that the cost of band ligation was less than 15 times that of LHP. But despite its high cost, they recommended that laser be used instead of LBL technology because of its effectiveness. After MM surgery, incisional discharge is typical. LHP prevents this need by avoiding the necessity for multiple dressing changes by a certified nurse[15]. Quick return to regular activities also considerably lowers expensive. Additionally, there is similarity in the cost analysis of methods utilizing disposable improved vessel sealing devices. Although specially designed optical fiber is disposable, it costs a lot less than the pricy stapler used in stapled hemorrhoidectomy. Multiple uses of these materials following appropriate sterilization can lower costs. Additionally, surgeons can quickly learn LHP through three to five instances and surgical residents can easily learn how to use laser devices[12]. Residents in surgery actively participated in our team.

CONCLUSION

Laser Haemorrhoidoplasty procedure is a reliable for treating all the grade 2, grade 3 and grade 4 haemorrhoidal cases. Asperthis study results, it canbe clearlystated that laser surgery is highly effective for grade 2 and grade 3.For better understanding multicentric, large series studies are needed. By including mucopexy, maximizing the energy delivered to the tissue, administering more doses, and scheduling repeat sessions in the right patients, recurrence rates can be decreased. LHP is a well-liked treatment that requires standardization and improvement but has acceptable recurrence rates and efficacy in certain patient categories.

REFERENCE

1. Johanson, J.F. and A. Sonnenberg, 1990. The prevalence of hemorrhoids and chronic constipation. Gastroenterol., 98: 380-386.
2. Madoff, R.D. and J.W. Fleshman, 2004. American Gastroenterological Association technical review on the diagnosis and treatment of hemorrhoids. Gastroenterol., 126: 1463-1473.
3. Milligan, E.T.C., C.N. Morgan, L. Jones and R. Officer, 1937. Surgical anatomy of the anal canal, and the operative treatment of hæmorrhoids. Lancet., 230: 1119-1124.
4. Gerbershagen, H.J., S. Aduckathil, A.J.M. van Wijck, L.M. Peelen, C.J. Kalkman and W. Meissner, 2013. Pain intensity on the first day after surgery. Anesthesiol., 118: 934-944.
5. Morinaga, K., K. Hasuda and T. Ikeda, 1995. A novel therapy for internal hemorrhoids: ligation of the hemorrhoidal artery with a newly devised instrument (Moricorn) in conjunction with a doppler flowmeter. Am. J. Gastroenterol., 90: 610-603.
6. Sohn, N., J.S. Aronoff, F.S. Cohen and M.A. Weinstein, 2001. Transanal hemorrhoidal dearterialization is an alternative to operative hemorrhoidectomy. Am. J. Surg., 182: 515-519.
7. Giamundo, P., W. Cecchetti, L. Esercizio, G. Fantino and M. Geraci *et al*., 2010. Doppler-guided hemorrhoidal laser procedure for the treatment of symptomatic hemorrhoids: Experimental background and short-term clinical results of a new mini-invasive treatment. Surg. Endoscopy, 25: 1369-1375.
8. Crea, N., G. Pata, M. Lippa, D. Chiesa, M.E. Gregorini and P. Gandolfi, 2014. Hemorrhoidal laser procedure: Short-and long-term results from a prospective study. Am. J. Surg., 208: 21-25.
9. Maloku, H., Z. Gashi, R. Lazovic, H. Islami and A. JunikuShkololli, 2014. Laser hemorrhoidoplasty procedure vs open surgical hemorrhoidectomy: A trial comparing 2 treatments for hemorrhoids of third and fourth degree. Acta Informatica Med., 22: 365-367.
10. Jahanshahi, A., E. Mashhadizadeh and M.H. Sarmast, 2012. Diode laser for treatment of symptomatic hemorrhoid: A short term clinical result of a mini invasive treatment, and one year follow up. Pol. J. Surg., 84: 329-332.
11. Giamundo, P., M. Geraci, L. Tibaldi and M. Valente, 2014. Closure of fistula-in-ano with laser-filac™: An effective novel sphincter-saving procedure for complex disease. Colorectal Dis., 16: 110-115.
12. Naderan, M., S. Shoar, M. Nazari, A. Elsayed, H. Mahmoodzadeh and Z. Khorgami, 2016. A randomized controlled trial comparing laser intra-hemorrhoidal coagulation and milligan morgan hemorrhoidectomy. J. Invest. Surg., 30: 325-331.

13. Karahaliloglu, A.F., 2010. Laser hemorrhoidoplasty (LHP): A new surgical procedure for the treatment of advanced hemorrhoidal illness. Coloproctol., 32: 116-123.
14. Weyand, G., C.S. Theis, A.N. Fofana, F. Rüdiger and T. Gehrke, 2017. Laserhämorrhoidoplastie mit dem 1470-nm-diodenlaser in der behandlung des zweit- bis viertgradigen hämorrhoidalleidens-eine kohortenstudie mit 497 fällen. Zentralbl. Chir., 144: 355-363.
15. Brusciano, L., C. Gambardella, G. Terracciano, G. Gualtieri and M.S. di Visconte *et al*., 2019. Postoperative discomfort and pain in the management of hemorrhoidal disease: Laser hemorrhoidoplasty, a minimal invasive treatment of symptomatic hemorrhoids. Updates Surg., 72: 851-857.
16. Faes, S., M. Pratsinis, S. Hasler-Gehrer, A. Keerl and A. Nocito, 2019. Short- and long-term outcomes of laser haemorrhoidoplasty for grade Ii Iii haemorrhoidal disease. Colorectal Dis., 21: 689-696.
17. Karahaliloglu, A.F., 2007. First results after laser obliteration of first-and second-degree hemorrhoids. Coloproctol., 29: 327-336.
18. Plapler, H., R. Hage, J. Duarte, N. Lopes, I. Masson, C. Cazarini and T. Fukuda, 2009. A new method for hemorrhoid surgery: Intrahemorrhoidal diode laser, does it work? Photomedicine Laser Surg., 27: 819-823.