Section: General surgery

Original Research Article

A COMPARATIVE STUDY ON LASER HEMORRHOIDOPLASTY VERSUS CONVENTIONAL HEMORRHOIDECTOMY FOR GRADE III HEMORRHOIDS

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Received *: 10/03/2025*
Received in revised form *: 26/03/2025*
Accepted *: 07/04/2025*

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DOI: 10.70034/ijmedph.2025.2.16

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

Int J Med Pub Health
2025; 15 (2); 83-86

ABSTRACT

Background: Hemorrhoidal disease is one of the most common proctological disease and affects between 7 and 30% of the general population. Open hemorrhoidectomy is the current gold standard. However, it is associated with significant pain, bleeding and wound infection which can result in prolonged hospital stay. Laser hemorrhoidoplasty (LHP) is a new minimally invasive and painless procedure for symptomatic hemorrhoids. But there is conflicting evidence regarding their resolution of symptoms and recurrence rates.

Materials and Methods: This is a prospective observational study conducted in a tertiary hospital in Visakhapatnam from January 2021 to December 2023. A total of 80 patients presenting with symptomatic grade III hemorrhoids were included in the study, of whom 40 underwent Laser Hemorrhoidoplasty (LHP) and 40 underwent open hemorrhoidectomy. Group selection was done by simple randomization using the lottery method. Postoperative pain levels were measured every day at rest during the entire hospital stay using the Visual Analog Scale (VAS). All patients received a follow-up after 15 days, 3months, 6 months and 1 year postoperative.

Results: The MM procedure presented longer mean operative time (27 ± 3.7min vs 15 ± 2.3 min, $p < 0.0001$) and longer hospitalization (3.8 ± 1.2 vs 1.3 ± 0.7 days, $p < 0.0001$). Mean postoperative pain score evaluated through the visual analog scale (VAS) was significantly lower in LHP group ($p < 0.0001$) at each follow-up point. Patients after LHP returned to regular activity after 6.8± 1.4 days vs 13.6± 2.8 days after MM procedure ($p < 0.001$). 1 year follow up showed a higher recurrence rate after LHP procedure (15% vs 2.5%, $p < 0.05$).

Conclusion: LHP is a safe, minimally invasive procedure with benefits in operative time, blood loss, postoperative pain and quicker return to activity, though recurrence rates might be higher. Though MM has immediate postop disadvantages including significant postoperative pain, this technique does result in a low risk of symptom recurrence.

Keywords: LHP- Laser Hemorrhoidoplasty, MM- Milligan-Morgan (open haemorrhoidectomy), Hemorrhoidal disease.

INTRODUCTION

Hemorrhoidal disease is one of the most common proctological disease and affects between 7 and 30% of the general population.[1] It is a consequence of an increased blood flow to the superior rectal artery, which causes dilatation of the hemorrhoidal plexus. There is also degradation of the supportive tissue that results in sliding down of haemorrhoids.[2] Open hemorrhoidectomy was first described in 1937 by Milligan-Morgan and is still considered as the gold standard therapy.[3] However, it is associated with significant pain, bleeding and wound infection which can result in prolonged hospital stay. Therefore,

various non-excisional therapies such as laser therapies have been developed to reduce pain and improve recovery.[4] Laser Hemorrhoidoplasty (LHP) first described in 2007 by Karahaliloglu et al in which hemorrhoidal arterial flow feeding the hemorrhoidal plexus is stopped by laser coagulation[5]. But there is conflicting evidence regarding their resolution of symptoms and recurrence rates[6]. Hence this study is being done to evaluate the benefits of Laser therapies, their clinical efficacy and long-term outcomes.

Aim: Aim of the current study was to evaluate the postoperative outcomes of patients with symptomatic Grade 3 hemorrhoids undergoing Laser Hemorrhoidoplasty (LHP) vs conventional open hemorrhoidectomy.

MATERIALS AND METHODS

Study design

This is a prospective observational study conducted in a tertiary hospital in Visakhapatnam from January 2021 to December 2023.

Inclusion criteria include patients with symptomatic grade III hemorrhoids whose age greater than 18 years. Exclusion criteria were thrombosed hemorrhoids, patients affected by inflammatory bowel diseases (IBD) involving rectum or anus, recurrent hemorrhoids and grade IV hemorrhoids.

A total of 80 patients presenting with grade III hemorrhoids were included in the study, of whom 40 underwent Laser Hemorrhoidoplasty (LHP) and 40 underwent open hemorrhoidectomy. Group selection was done by simple randomization using the lottery method. Postoperative pain levels were measured every day at rest during the entire hospital stay using the Visual Analog Scale (VAS). All patients received a follow-up after 15 days, 3months, 6 months and 1 year postoperative.

Operation technique

Laser hemorrhoidoplasty

In lithotomy position, under spinal anaesthesia, skin microincision was made about 1 cm from the anal verge at the base of each hemorrhoid. Bare tip Lasotronix probe was driven through the incision in the submucosal tissue until it reaches the hemorrhoidal vascular pedicle. Then, intraluminal delivery of 70-90 J energy about 2-4 cm above dentate line was fired to obliterate hemorrhoidal vessel (ten to twelve pulses 8 watts per 3 s each) using a 1470-nm diode laser. Then the laser probe was advanced into the hemorrhoidal tissue and moved in and out to target the entire bulk of tissue (90-120 J energy was delivered into hemorrhoidal mass). We aim to deliver no more than 250 J per hemorrhoid. The anal wounds were left open. A cold wet gauze was compressed against hemorrhoid to reduce swelling and to reduce mucosal injury. All patients were discharged home on next day after removing the anal pack.

Figure 1: Settings of Laser machine for Grade III haemorrhoids

Figure 2: Submucosal delivery of energy at apex of pile mass

Figure 3: Obliteration of hemorrhoidal tissue using laser energy

Open hemorrhoidectomy (Milligan-Morgan)

Patients were placed in lithotomy position, and spinal anesthesia was performed. The hemorrhoid is elevated and 'V' cut given over the external skin and anoderm. The hemorrhoid is dissected off the sphincter mechanism and excised. The pedicle is ligated and the wound was left open to epithelialize. Hemostasis was achieved and anal pack was placed.

Study outcomes

The primary outcome of the current study was to analyse the postoperative pain (according to VAS score), postoperative bleeding and the symptoms relief in the first postoperative month. The secondary outcome was the evaluation of medium-term recurrence and complications after the procedures within 1 year follow-up.

Statistical Analysis

All statistical analysis was done by using the SPSS trail version and in MS-Excel 2007. Qualitative variables were expressed as in frequencies and percentages. Quantitative variables were expressed as in means and standard deviations. Chi-square test was used for examining the categorical data. Student independent sample t test was used for comparison of mean difference between two groups. For all statistical analysis P<0.05 was statistically significant.

RESULTS

Table 1

	LHP group (*n* = 40)	MM group (*n* = 40)	P value
Age (years)	41 ± 9.6	42 ± 11.6	0.6756
Operative time (min)	15 ± 2.3	27 ± 3.7	<0.001
Intraoperative blood loss(ml)	11.7 ± 4.5	34.8 ±6.8	<0.001
Pain			
POD 1 VAS scores	3.3 ± 0.7	7.9 ± 1.5	<0.001
POD 3 VAS scores	1.3 ± 0.5	6.7 ± 1.2	<0.001
POD 5 VAS scores	0.7 ± 0.4	5.2 ± 1.6	<0.001
Post op Bleeding d1	4 (10%)	14 (35%)	0.0074
Post op Bleeding d3	1 (2.5%)	8 (20%)	0.0133
Urinary retention	1(10%)	9(22.5%)	0.0068
Thrombosis	4(10%)	0	0.0404
Duration of hospital stay	1.3 ± 0.7	3.8 ± 1.2	<0.001
Return to work	6.8± 1.4	13.6± 2.8	<0.001
Anal stenosis	0 (0%)	1 (2.5%)	0.3149
Recurrence (1 year follow up)	6(15%)	1 (2.5%)	0.0479

A total of 80 patients participated in the study. The MM procedure presented longer mean operative time (27 ± 3.7min vs 15 ± 2.3 min, p < 0.0001) and longer hospitalization (3.8 ± 1.2 vs 1.3 ± 0.7 days, p < 0.0001). Mean postoperative pain score evaluated through the visual analog scale (VAS) was significantly lower in LHP group (p < 0.0001) at each follow-up point. Patients after LHP returned to regular activity after 6.8± 1.4 days versus 13.6± 2.8 days after MM technique (p < 0.001).

1 year follow up (physical examination) showed a higher recurrence rate after LHP procedure (15% vs 2.5%, p < 0.05). Other complications reported after LHP included mucosal damage (4%), edema and thrombosis of internal hemorrhoids (10%).

1(10%) of LHP and 9(22.5%) of patients who underwent MM had urinary retention. No patient experienced anal stenosis in LHP group during all the follow-up period. 1 (2.5%) patient in MM group reported mild anal stenosis at 3 months which was conservatively managed.

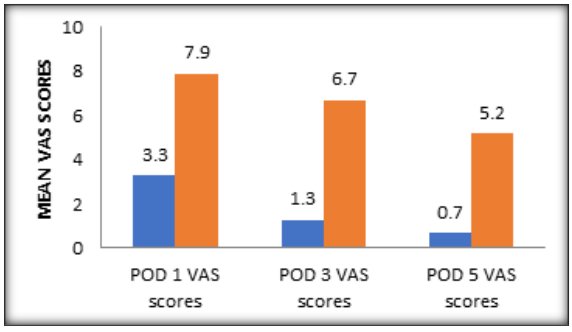

Figure 4: Comparing mean VAS scores between LHP and MM groups on POD 1, 3 and 5

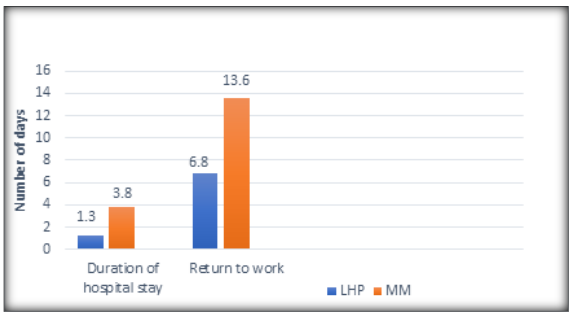

Figure 5: Comparing mean duration of hospital stay and return to regular work between LHP and MM groups

DISCUSSION

Laser Hemorrhoidoplasty (LHP) is a new minimally invasive procedure for hemorrhoids in which hemorrhoidal arterial flow feeding the hemorrhoidal plexus is stopped by laser coagulation.[7] It also induces hemorrhoidal tissue shrinkage by causing submucosal protein denaturation.[8] This subsequently leads to cellular fibrosis, followed by adherence to its underlying tissue, thereby preventing recurrent prolapse in the long term.[9] The diode laser (wavelength = 1470nm) penetrates up to 2 mm, determining a submucosal denaturation and a controlled shrinkage of the hemorrhoidal tissue. It is selectively and better adsorbed by the hemoglobin, as compared to Nd:YAG laser, and consequently less harmful to the surrounding tissue, preventing any sphincter damage.[10] Laser therapies conferred the advantages of a quick return to normal activities and low postoperative pain. The latter is explained by the absence of excision of tissue below the dentate line, where pain fibers are present.

Similar to our study, a randomized controlled trial of 121 patients in 2019 by Poskus etal,[11] comparing LHP with 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 (recurrence of 15% for LHP) a systematic review by Longchamp et al showed a recurrence rate upto 11.3% after LHP at 1 year follow up.[12] In 2019 prospective study in Switzerland by Faes et al on 50 men and women with grade II to III hemorrhoids undergoing LHP estimates the 5-year recurrence to be 36%.[13]

CONCLUSION

LHP is a safe, minimally invasive procedure with benefits in operative time, blood loss, postoperative pain and quicker return to activity, though recurrence rates might be higher. Though MM has immediate postop disadvantages including significant postoperative pain, this technique does result in a low risk of symptom recurrence.

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