

# EVALUATION OF LASER HEMORRHOIDOPLASTY AND MILLIGAN-MORGAN HEMORRHOIDECTOMY: A COMPARATIVE STUDY

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## Abstract

**Background:** This study was designed to compare between laser hemorrhoidoplasty and Milligan-Morgan hemorrhoidectomy and evaluate advantages of laser surgery in terms of postoperative pain, bleeding, operative time, analgesics requirements and complications.

**Materials and Methods:** A prospective study was carried out in Department of Surgery, Dr D Y Patil medical college, Kolhapur. 100 patients with symptomatic grade 3 and grade 4 hemorrhoids were randomly divided into two groups, of which 50 patients were treated with Laser hemorrhoidoplasty and 50 patients with Milligan-Morgan hemorrhoidectomy. Postoperative pain, operative time, bleeding, complications were evaluated. **Results:** Postoperative pain was significantly lower in laser hemorrhoidoplasty than Milligan-Morgan group ( $P < 0.001$ ). The operative time and intra-operative blood loss and post-operative analgesics requirements was less in laser group. ( $P < 0.001$ ). Urinary retention and anal stenosis were seen in Milligan-Morgan group and not in laser group. Less hospital stay and early resume to work was seen in laser group. ( $P < 0.001$ ). **Conclusion:** Laser hemorrhoidoplasty is more preferred in comparison with Milligan-Morgan hemorrhoidectomy as it carries several advantages such as less post-operative pain, less operation time, less bleeding, less hospital stay, less analgesics requirements, no risk of incontinence, early resume to normal activities. Our study suggests Laser hemorrhoidoplasty is preferred to open Milligan-Morgan hemorrhoidectomy.

**Keywords:** Hemorrhoids, Laserhemorrhoidoplasty, Milligan-Morgan hemorrhoidectomy, Post-operative pain

## Introduction

Hemorrhoidal disease is most common benign disease of rectum and anal canal. The estimated worldwide prevalence in general population is 4.4% (1). Hemorrhoids are often seen in patients who strain during defecating, lifting heavy objects, and have prolonged sitting like long-distance drivers and pilots(2). Hemorrhoids is most common due to urbanization, due to lifestyle changes and changes in dietary habits. Age distribution demonstrates a Gaussian distribution with a peak incidence between 45 and 65 with subsequent decline after 65 years (1,3). Hemorrhoids are more common in males than females(4). Because of increased incidence of hemorrhoids and despite treatment diversity, several complications such as bleeding, strangulation, thrombosis, fibrosis, ulceration, suppuration and portal pyemia can occur (5). The anorectal vascular cushions along with internal anal sphincter are essential in maintenance of continence by providing soft tissue support and keeping anal canal closed tightly. Hemorrhoids are formed by the dilatation of inferior hemorrhoidal plexus.(5). It is considered to be due to downward displacement of suspensory (Treitz) muscle (6,7). There are many treatment modalities of hemorrhoids varying from medications, band ligation, stapled hemorrhoidopexy, sclerotherapy, Doppler guided artery ligation, laser hemorrhoidoplasty and finally surgery (8).

Milligan-Morgan (MM) procedure is globally considered the gold standard and most frequently used surgical method(9). Postoperative pain is the most common trouble with this surgery. The other early complications are urinary retention, hemorrhage (secondary or reactionary) and abscess formation. The longterm complications include anal fissure, anal stenosis, stool incontinence, perianal fisula and recurrence of the disease (10).

These drawbacks have led to the introduction of diode laser treatment in hemorrhoids, giving rise to numerous advantages such as easy and efficient application, and non invasive, nontoxic painless in nature in addition to reduce the need of pharmaceutical drugs, drug intereactions, and their side effects (11). The aim of this study was to compare pain, duration of time, blood loss, hospital stay, early return to work between two methods, Laser hemorrhoidoplasty (LHP) and Milligan-Morgan open hemorrhoidectomy.

## Material and Methods

A prospective study was carried out in Department of surgery of Dr. D Y Patil Medical College, Kolhapur after obtaining approval of the Ethics Committee. Patients who fulfilled the inclusion and exclusion criteria and completed the follow up for 6 months were included in the study. There were 100 consecutive patients during the period April 2018 to August 2023.

Eligible patients were randomly assigned using sealed opaque envelopes in the operating room into one of two groups: group A Laser hemorrhoidoplasty (LHP) n=50 and group B Milligan-Morgan hemorrhoidectomy (MM) n=50.

A written informed consent was obtained from all participants after an explanation of the associated risks, benefits, and description of the study protocol. The inclusion criteria included diagnosis of hemorrhoid grade 3 and 4. The exclusion criteria included coexisting anorectal disease, local complications (such as perianal fistula, anal fissure, or abscess), previous history of anorectal surgery, regular use of immunosuppressants or analgesics,

patients with neurologic deficit or chronic pain syndrome and patients already taking narcotic analgesics in addition to unfit patients either for surgery or anaesthesia due to bad general conditions, hematological disorders, liver cirrhosis, uncontrolled diabetes and pregnancy.

### **Operative technique:**

The procedures were standardized as far as possible to allow comparability. The operations were performed under spinal anaesthesia with patients in lithotomy position.

**Group A: Laser hemorrhoidoplasty.( LHP)**

In this group, we used Lasotronix 980 nm 15W, diode laser machine which is composed of laser generator device, SMA 905 connector, 600 micrometer core bare fibre (300 cm) long.

All cases underwent anorectal examination for other anorectal diseases. While using laser machine antilaser goggles were used. With diode 15 W,980 nm wavelength, energy was delivered at 8 Watt continuous mode with bare fibre. For each hemorrhoid at 3, 7, and 11 o'clock, energy delivered in three steps. Step 1- 60 joules intraluminal without touching the mucosa 2 cm above upper border of hemorrhoid 1 cm on either side. Step 2- after making entry with bare fibre from 5 mm lateral to intersphincteric groove into submucous plane, 70 joules of energy was delivered to 2 cm above upper border of hemorrhoid and Step 3- while withdrawing bare fibre, 80 joules was delivered intrahemorrhoidal in fan shaped fashion. After delivering energy ice pack with pressure was applied. Energy is absorbed by RBCs leading to coagulation and retraction of hemorrhoid and tissue retraction around vessel immediately after laser application, leads to proper resolution of hemorrhoid.

**Group B: Milligan-Morgan hemorrhoidectomy (M and M)**

In this first expose the field by Ferguson retractor or speculum and then make 'V' shaped incision after fixation of hemorrhoid with allis forceps. Then cutting skin and mucous membrane at mucocutaneous junction and pushing the internal sphincter laterally until reaching the pedicle of hemorrhoid, which is then transfixed with silk ligature. At the end excise the hemorrhoid distal to ligature. Same procedure is repeated for all hemorrhoids. Care is taken to cut less anoderm and keep breaches between each to avoid stricture formation.

### **Results**

A total of 100 patients were allocated to two groups with 50 cases each, undergoing Laser hemorrhoidoplasty (group A) and Milligan-Morgan hemorrhoidectomy (group B). No harm or unintended effects were received by any patient. No changes were made in the method, design, and eligibility criteria of the study. The two groups were similar in terms of mean age and sex ratio, preoperative symptoms, hemorrhoidal grades.( Table no- 1)

Postoperative pain was significantly lower in group A than in group B in follow-up from postoperative day 1 to 6 months. (Table no-2 and 3). The postoperative requirement of Inj Tramadol and number of analgesics required after discharge was significantly lower in group A than in group B. (  $P < 0.001$ ) ( Table no-4).

Operative time was less in group A than in group B. (  $P < 0.001$ ). The intraoperative blood loss was less in group A than in group B. (  $P < 0.001$ ).

The hospital stay was lower in group A than in group B. (  $P < 0.001$ ). (Table no-4).

The period of patients needed to return to work was significantly lower in group A than in group B. (  $P < 0.001$ ).

The incidence of postoperative urinary retention, and anal stenosis was seen in group B and not in group A.

**Table no1: Demographic characteristics of patients.**

Variable	Laser hemorrhoidoplasty Group	Milligan-Morgan Hemorrhoidectomy group
Gender		
Male	28 (56.00 %)	26 (52.00 %)
Female	22 (44.00%)	24 (48.00%)
Age (Years)	36.12 +/- 10.12	36.40 +/- 9.90
Cause of referring	14 ( 28.00 %)	12 (24.00 %)
Pain	34 (68.00 %)	35 (70.00 %)
Bleeding	2 (4.00 %)	3 ( 6.00 %)
Itching		
Grade of hemorrhoid		
Grade 3	21 ( 42.00 %)	22 (44.00 %)
Grade 4	29 (58.00 %)	28 (28.00 %)

**Table no.2: Pain presentation by VAS in Laser hemorrhoidoplasty group.**

Vas score	POD 1	POD 2	POD 7	POD 14	POD 21	Posop 1 month	Postop 2 month	Postop 6 month
0 to 1	43/50	47/50	48/50	49/50	50/50	50/50	50/50	50/50
2 to 5	7/50	3/50	2/50	1/50	0/50	0/50	0/50	0/50
>5	0/50	0/50	0/50	0/50	0/50	0/50	0/50	0/50

(POD-postoperative day)

**Table no. 3: Pain presentation by VAS in Milligan-Morgan hemorrhoidectomy group.**

Vas score	POD 1	POD 2	POD 7	POD 14	POD 21	Postop 1 month	Postop 2 month	Postop 6 month
0 to 1	0/50	0/50	0/50	9/50	20/50	35/50	45/50	50/50
2 to 5	40/50	41/50	45/50	40/50	30/50	15/50	5/50	0/50
>5	10/50	9/50	5/50	1/50	0/50	0/50	0/50	0/50

**Table no-4: Comparision between Laser hemorrhoidoplasty and Milligan-Morgan hemorrhoidectomy group**

	Laser hemorrhoidoplasty Group n=50	Milligan-Morgan Hemorrhoidectomy Group n=50	P Value
Operative time (min)	28.63+/- 4.8	48.50 +/- 10.12	<0.001
Intraoperative blood loss	10.20 +/- 4.7	38.50 +/- 7.50	<0.001

Postoperative Tramadol dose	1.67 +/- 1.55	8.40 +/- 2.56	<0.001
Using oral analgesic After discharge (n=%)	22 ( 44 %)	45 (90 %)	<0.001
Hospital stay (days)	1.10 +/- 0.30	3.5 +/- 0.50	<0.001
Return to work (in days)	7.00 +/- 1.2	3.5 +/-0.50	<0.001

## Discussion

In this study, mean operation time in LHP group was shorter than M and M group. Intraoperative blood loss was less in LHP group. On the day of surgery, the patients in LHP group had less postoperative pain and needed fewer doses of tramadol injections and thereafter postoperative fewer oral analgesics requirement. In this study hospital stay was less in LHP group and patients in LHP group resumed normal duties earlier.

In this study four patients in LHP group had thrombosis after 3 to 4 days after surgery which was managed medically with hot fomentations and daflon as medical agent. Whereas in M and M group 17 patients had postoperative complications: six patients had early postoperative urine retention who were managed by insertion of foley catheter, two patients had early postoperative bleeding from surgical wound, anal packing and hemostatic drugs stopped the bleeding. In addition 5 patients had excessive discharge from the surgical wound, which was managed by antibiotics, followed by complete recovery during followup period. Four patients had anal stenosis who were readmitted in hospital and treated by lateral sphincterotomy under anaesthesia, followed by complete recovery during followup period.

In our study 2 patients in M and M group had recurrence and no recurrence in LHP group in six month follow up.

Different studies reported that Laser therapy was more effective than open hemorrhoidectomy in terms of reduced postoperative pain, operative time, blood loss, and time to return to normal activity.

The study by Sadra and Keshavarz (12) found superiority with 980 nm diode laser in comparison with Milligan-Morgan group in terms of pain level, severity of postoperative hemorrhage, hospital stay, and degree of analgesics requirements.

The study by Naderan *et al.* (13) verified that intrahemorrhoidal treatment with 980 nm diode laser has some advantages over Milligan-Morgan hemorrhoidectomy in treating patients for symptomatic hemorrhoids, This procedure has shorter operative time, less postoperative pain, and better regression of hemorrhoidal pockets.

The study by Chia *et al.* (14) shows laser hemorrhoidoplasty has an upper edge since it is hemostatic, less painful, bactericidal, leads to faster healing, and it is associated with lesser complications, and maintains the physiology of the anal canal by preserving the anal cushions. Maluku *et al.* (15) reported that laser hemorrhoid treatment was more efficient than Milligan-Morgan hemorrhoidectomy in reducing postoperative pain and mean time of operation

Crea *et al.* (16)) concluded that using 980 nm diode laser for treatment of grade 2 and 3 symptomatic hemorrhoids was considered to be safe, efficient, and painless. No significant complications such as stenosis and recurrence occurred at 2 years of follow up.

### Conclusion

Laser hemorrhoidoplasty procedure is more preferred in comparison with conventional open Milligan-Morgan surgical hemorrhoidectomy. Laser hemorrhoidoplasty carries several advantages such as less operative time, less postoperative pain, reduced doses of analgesics needed, less intraoperative and postoperative bleeding, no risk of anal stenosis, less hospital stay, and early return to normal activity. also, no tissue is removed in laser hemorrhoidoplasty and anal cushions are preserved, so no chance of incontinence. Our study suggests that diode laser treatment if available is the favourite surgical treatment.

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