Section: General Surgery

Original Research Article

A PROSPECTIVE RANDOMIZED STUDY OF LASER HEMORRHOIDECTOMY AND OPEN HEMORRHOIDECTOMY IN PATIENTS WITH GRADE III AND GRADE IV HEMORRHOIDS

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ABSTRACT

Background: Aim: To compare the outcomes of Laser Hemorrhoidectomy and Open Hemorrhoidectomy. **Objectives:** To compare Operating time, postoperative complications like pain, bleeding, wound infection, and hospital stay length. **Materials and Methods: Study Design:** A prospective randomised controlled study. Over the course of two years, 80 patients are studied. Simple randomization divides the study population into two groups. Patients in Group A had laser hemorrhoidectomy, while patients in Group B had open hemorrhoidectomy. The visual analogue scale is used to compare postoperative pain in both groups. The pain is evaluated after 6 hours, 24 hours, 48 hours, the third day, and the seventh day. Postoperative complications such as bleeding and wound infection are evaluated. **Objective:** Hemorrhoidectomy. The postoperative pain in both the groups is compared by visual analog scale. The pain is assessed at 6hours in first postoperative day, 24hours, 48hours, 3rd day and 7th day. Operating time and Postoperative complications such as bleeding, wound infection and are assessed. **Results:** The mean difference in pain score between Laser Hemorrhoidectomy and open Hemorrhoidectomy at 6 hours, 24 hours, 48 hours, three days, and seven days was statistically significant (p-value 0.05) in our study. Our findings show that when compared to open hemorrhoidectomy, laser hemorrhoidectomy has lower pain scores. The average day of discharge in the study population was 1.05 ± 0.58 for Laser Haemorrhoidectomy and 3.08 ± 1 for open Haemorrhoidectomy. At 24 hours, 12 (30%) participants in the Laser Haemorrhoidectomy group and 22 (55%) participants in the Open Haemorrhoidectomy group had bleeding, according to our findings. The difference in proportion for bleeding after 24 hours was statistically significant between the study groups. (The p-value is 0.024). However, after 48 hours in the study population, 8 (20%) participants in the Laser Haemorrhoidectomy group and 10 (25%) participants in the Open Haemorrhoidectomy group had bleeding. In open hemorrhoidectomy, the operating time is 48.9 ±3.15 minutes, while laser hemorrhoidectomy takes 12.65 ±1.03 minutes. In the Open Haemorrhoidectomy group, 5 (12.5%) of the participants were infected. Infection occurred in 0 (0%) of the laser Haemorrhoidectomy participants. **Conclusion:** Because of the ease of implementation, the lack of additional risks to the patient during the procedure, and the possibility of performing it as outpatient surgery, Laser Hemorrhoidectomy can be extremely beneficial and practical. Hence, Laser Hemorrhoidectomy is advantageous for patients comparing to Open Hemorrhoidectomy.

INTRODUCTION

Haemorrhoids are one of the most common clinical conditions we have seen in our surgical practice. The terms 'haemorrhoids' and 'piles' are commonly used interchangeably, but they have entirely different meanings.[1] The term "haemorrhoids" is derived from the Greek adjective "haemorrhoids," which means "bleeding" (Haima=blood, rhoos=flowing) and emphasises the most noticeable symptoms in the

majority of cases.[2] However, it cannot be applied to all conditions diagnosed as haemorrhoids because the majority of them do not have any bleeding tendency at all. The term 'pile,' derived from the Latin word pila, meaning a ball, can be used to describe all types of haemorrhoids or piles because virtually every such condition causes swelling of some kind, even if it does not show externally.[3]

Haemorrhoids are typically diagnosed based on their external appearance, patient symptoms, per rectal examination, proctoscopic examination, and sigmoidoscopic examination. To rule out rectum carcinoma, all cases should be screened with sigmoidoscopy.[4] Haemorrhoids can cause profuse bleeding, strangulation, thrombosis, ulceration, gangrene, fibrosis, and suppuration.[5] The treatment for complicated and uncomplicated haemorrhoids differs. In cases of severe pain, profuse bleeding, or strangulation, an emergency procedure may be indicated.[6] All individuals with haemorrhoids cannot be treated with a single treatment, and each one must be properly reviewed with clinical findings, proctoscopic and sigmoidoscopic examination.

The most prevalent problem with open hemorrhoidectomy surgery is postoperative discomfort. Urinary retention, bleeding (secondary or reactionary), and abscess development are the additional early problems. Long-term consequences include anal fissure, anal stenosis, bowel incontinence, perianal fistula, and disease recurrence. These disadvantages prompted the development of laser hemorrhoidectomy, which has various advantages such as ease of use, non-invasive and non-toxic nature, and painlessness. My goal in this study is to compare the efficacy of laser hemorrhoidectomy versus open hemorrhoidectomy in the treatment of haemorrhoids.

Objectives: To compare operating time, postoperative problems such ache, wound infection, and hemorrhage, and hospital stay length.

MATERIALS AND METHODS

It is a randomised controlled trial. Patients over the age of 21, with an American Society of Anaesthesiologists (ASA) physical status of I or II, and symptomatic internal haemorrhoid disease (grade III and grade IV) who have not responded to medical treatment (such as food and lifestyle changes, topical, or systemic medications), are eligible to participate in this study. Acutely thrombosed haemorrhoid and associated anorectal illnesses such as anal fissure are exclusion criteria. The study's goal and any potential problems were communicated to each participant, and signed informed permission was acquired from all patients prior to enrollment. Simple randomization divides the research population into two groups. Patients in Group A had laser hemorrhoidectomy, whereas those in Group B had open hemorrhoidectomy. Patients were placed in lithotomy posture and anoscopy was performed with a 23-mm-diameter proctoscope to detect haemorrhoid columns. Patients in Group A receive laser hemorrhoidectomy using a diode laser generating light at a wavelength of 980 nm (Biolitec AG-CeramOptec, Bonn, Germany). The light is connected into a fibre having a radial emission-ready distal fibre end and a cone shape for simple interstitial application. the fiber is injected in the hemorrhoidal tissue parallel to the axis of the rectum up to the upper section of the enlarged haemorrhoid after a 1mm incision is made at the external border of the haemorrhoid pocket. As the arterial flow was found, three 15W pulses were administered to the tissue, each lasting 1.2 seconds with a

0.6 second gap between pulses. Milligan Morgan hemorrhoidectomy is performed on individuals in group B.

The visual analogue scale is used to compare postoperative pain in both groups. The pain is evaluated every 6 hours on the first postoperative day, then at the end of one week and two weeks. Three and four weeks. Postoperative problems such as haemorrhage and wound infection are evaluated.

RESULTS

Haemorrhoidectomy is a popular surgical operation, although alternative therapies like laser haemorrhoidectomy have been employed now. The goal of this study was to assess the outcome and postoperative complications of laser versus open haemorrhoid surgery. One of the most prevalent negative effects of urbanisation is haemorrhoids. During the last 50 years, this disease has impacted more than half of the population, and it has been seen in both sexes and throughout a wide age range. Lasers were first employed in medicine and ophthalmology. Laser therapy is now widely employed in the outpatient treatment of haemorrhoids. During the treatment procedure, the arterial blood flow of haemorrhoids is halted using Doppler laser coagulation. Another option is to beam a laser into the hemorrhoidal packet, causing fibrosis and causing the hemorrhoidal packet to shrink and adhere to the anal canal wall, avoiding prolapse.

The study's major goal is to compare the results of Laser Hemorrhoidectomy versus Open Hemorrhoidectomy. Our study focused on the respondent's operating time, postoperative issues such as discomfort, wound infection, bleeding, and duration of hospital stay.

Characteristics of the Study Population

The average age of our participants is 36.5 years, with a minimum of 21 years and a maximum of 63 years. The study population was made up of 75% males and 25% females. 71.25% of the study sample had Grade III haemorrhoids, whereas 28.75% had Grade IV.

Both the patient and the surgeon prefer a straightforward hemorrhoidectomy. Virtually all of the proposed hemorrhoidectomy approaches are projected to minimise postoperative discomfort,

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bleeding, and length of stay, as well as allow patients' rapid return to daily activities, hence increasing patients' quality of life following surgery. Because the consequences of such procedures can be highly devastating and result in serious bleeding, employing these techniques necessitates a high degree of expertise and training. The surgeon's abilities and expertise must be considered while deciding on a surgical treatment for the surgery's results to be good and healthy. Additionally, intense discomfort during the first- and second-days following hemorrhoidectomy is the most prevalent complaint among patients. The discomfort is likely to disturb the patient for a few days, which can be upsetting.

In our present study, the mean difference in pain score at 6 hours, 24 hours, 48 hours, three days, and seven days was statistically significant (p-value 0.05) between Laser Hemorrhoidectomy and Open Hemorrhoidectomy. Our data suggest that as compared to open hemorrhoidectomy, laser hemorrhoidectomy had lower pain levels. Another study conducted by Masson discovered that laser hemorrhoidectomy produces less postoperative discomfort than other surgical procedures including open hemorrhoidectomy.

The average day of discharge in the study population was 1.05 ± 0.58 for Laser Haemorrhoidectomy and 3.08 ± 1 for open Haemorrhoidectomy. The study group's mean difference in discharge day was statistically significant. (The p-value is 0.001). Yet, the shorter time of hospitalisation in the laser group was noteworthy in Sankar's study. Furthermore, the Masson study showed that hemorrhoidectomy patients treated with laser-based procedures required no or limited hospitalisation, had fewer expenditures, and returned to normal chores sooner.

Postoperative bleeding, urinary retention, painful defecation, fistula, acute infection fissure, anal stenosis, faecal incontinence, and postoperative thrombosis are the most usual postoperative complications in laser procedures. At 24 hours, 12 (30%) individuals in the Laser Haemorrhoidectomy group and 22 (55%) participants in the Open Haemorrhoidectomy group had bleeding, according to our findings. The difference in percentage for bleeding after

24 hours was statistically significant between the study groups. (The p-value is 0.024). Nevertheless, after 48 hours in the study population, 8 (20%) individuals in the Laser Haemorrhoidectomy group and 10 (25%) people in the Open Haemorrhoidectomy group developed bleeding.

The proportion of those who bled at 48 hours was not significantly different between the research groups. (The p- value is 0.592). In contrast, Sowula reported no incidences of postoperative haemorrhage throughout the follow-up. He states that patients who had laser therapy had a significantly simpler postoperative period and that problems were substantially less severe.

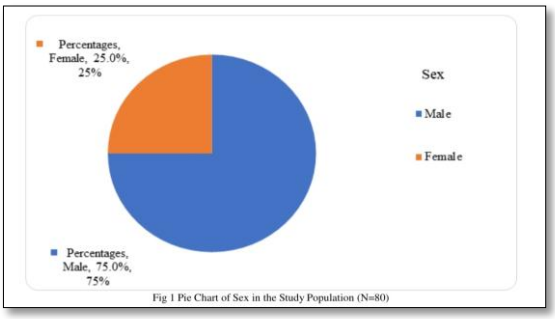


Fig 1 Pie Chart of Sex in the Study Population (N=80)

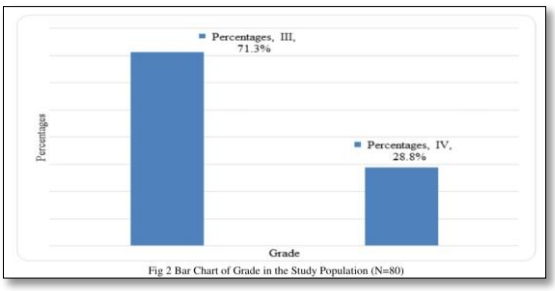
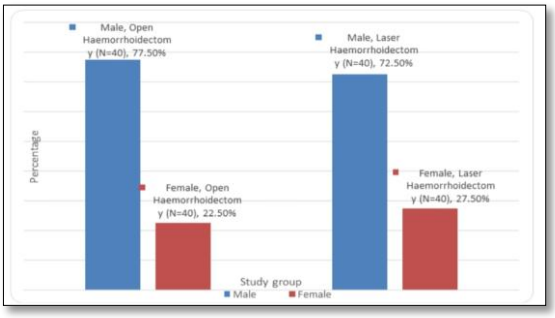


Fig 2 Bar Chart of Grade in the Study Population (N=80)



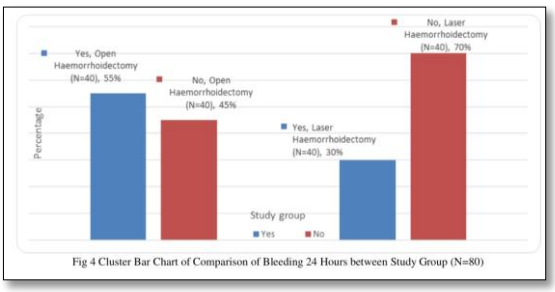


Fig 4 Cluster Bar Chart of Comparison of Bleeding 24 Hours between Study Group (N=80)

The Final Analysis Comprised a Total of 80 Individuals

Table 1: Descriptive Analysis of Age in Study Population (N=80)

Parameter	Mean ± SD	Median	Minimum	Maximum
Age	36.5 ± 8.13	38.00	21.00	63.00

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Table 2: Comparison of mean of Duration of Surgery between Study Group (N=80)

Parameter	Study group (Mean± SD)		P value
	Open Hemorrhoidectomy (N=40)	Laser Hemorrhoidectomy (N=40)	
Duration of surgery	48.93 ± 3.15	12.65 ± 1.03	0.034

Among the study population, the mean duration of surgery was 48.9 ± 3.15 in Open Hemorrhoidectomy and it was 12.65 ±1.03 in Laser Hemorrhoidectomy.

Table 3: Comparison of Sex between Study Group (N=80)

Sex	Study Group		P value
	Open Haemorrhoidectomy (N=40)	Laser Haemorrhoidectomy (N=40)	
Male	31 (77.5%)	29 (72.5%)	0.606
Female	9 (22.5%)	11 (27.5%)	

Table 4: Comparison of Grade between Study Group (N=80)

Grade	Study Group		P value
	Open Hemorrhoidectomy (N=40)	Laser Hemorrhoidectomy (N=40)	
III	34 (85%)	23 (57.5%)	0.007
IV	6 (15%)	17 (42.5%)	

Table 5: Comparison of Infection between Study Group (N=80)

Infection	Study Group	
	Open Hemorrhoidectomy (N=40)	Laser Hemorrhoidectomy (N=40)
Yes	5 (12.5%)	0 (0%)
No	35 (87.5%)	40 (100%)

Table 6: Comparison of mean of Day of Discharge between Study Group(N=80)

Parameter	Study group (Mean± SD)		P value
	Open Hemorrhoidectomy (N=40)	Laser Hemorrhoidectomy (N=40)	
Day of discharge	3.08 ± 1	1.05 ± 0.58	<0.001

Table 7: Comparison of mean of Duration of Surgery between Study Group(N=80)

Parameter	Study group (Mean± SD)		P value
	Open Hemorrhoidectomy (N=40)	Laser Hemorrhoidectomy (N=40)	
Duration of surgery	48.9 ± 3.15	12.65 ± 1.03	0.034

DISCUSSION

Haemorrhoidectomy is a popular surgical operation, although alternative therapies like laser haemorrhoidectomy have been employed now. The goal of this study was to assess the outcome and postoperative complications of laser versus open haemorrhoid surgery. One of the most prevalent negative effects of urbanisation is haemorrhoids. During the last 50 years, this disease has impacted more than half of the population, and it has been seen in both sexes and throughout a wide age range. Lasers were first employed in medicine and ophthalmology. Laser therapy is now widely employed in the outpatient treatment of haemorrhoids. During the treatment procedure, the arterial blood flow of haemorrhoids is halted using Doppler laser coagulation. Another option is to beam a laser into the hemorrhoidal packet, causing fibrosis and causing the hemorrhoidal packet to shrink and adhere to the anal canal wall, avoiding prolapse.

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The proportion of those who bled at 48 hours was not significantly different between the research groups. (The p- value is 0.592). In contrast, Sowula reported no incidences of postoperative haemorrhage throughout the follow-up. He states that patients who had laser therapy had a significantly simpler postoperative period and that problems were substantially less severe.

CONCLUSION

The use of laser-assisted technologies for hemorrhoidectomy did not aggravate the negative effects of surgery in patients. Additionally, these approaches can be incredibly advantageous and practical due to their ease of implementation, absence of extra dangers to the patient during the treatment, and the ability to execute it as outpatient surgery. These can be used instead of standard hemorrhoidectomy. Lasers are equally successful and safe as other traditional surgical procedures in treating anal lesions. When paired with other current therapies, effective laser technologies might open up new possibilities in the treatment of anorectal illnesses such as hemorrhoidectomy. Still, further study is needed in this area.

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