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Original Artical

Clinical Short-term Outcomes for Laser Hemorrhoidoplasty for Grade II and III Haemorroidal Disease: Experience in Bangladesh

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Introduction: Hemorrhoidal Diseases are a common medical condition affecting individuals worldwide, with grades II and III being considered mild to moderate stages. Laser hemorrhoidoplasty has emerged as a potential alternative to traditional surgical techniques, offering reduced postoperative pain and faster recovery times.

Objective: The primary objective of this study is to evaluate the efficacy and safety of laser hemorrhoidoplasty in grade II and III hemorrhoidal disease within a short-term follow-up period.

Methods: This is a retrospective study conducted at Anower Khan Modern Hospital; Dhaka, Care Hospital; Dhaka & Peerless Hospital; Naogaon, Bangladesh spanning from March 2019 to April 2023. Patients diagnosed with grade II and III hemorrhoidal disease who underwent laser hemorrhoidoplasty were included in the analysis. Data on patient demographics, pre-operative symptoms, procedural details, and post-operative follow-up visits were collected and analyzed.

Results: In this study, 255 patients underwent laser hemorrhoidoplasty for grade II and III hemorrhoidal disease at Anower Khan Modern Hospital; Dhaka, Care Hospital; Dhaka & Peerless Hospital, Naogaon (March 2019 to April 2023). Overall, laser hemorrhoidoplasty showed promising short-term outcomes for grade II and III hemorrhoidal disease, with effective symptom relief and minimal postoperative discomfort.

Conclusion: Laser hemorrhoidoplasty shows promise as a safe and efficient alternative treatment, warranting further investigation with larger cohorts and longer follow-up periods to validate its efficacy and safety.

Keywords: Laser Hemorrhoidoplasty, Hemorrhoidal Diseases, Laser Surgery.

Introduction

Hemorrhoidal disease, commonly known as hemorrhoids, is a prevalent medical condition affecting individuals worldwide [1]. Approximately half of the population above 40 years old experiences mild to severe forms of the disease [2]. Hemorrhoid disease ranks as the fourth leading outpatient gastrointestinal diagnosis in the United States, accounting for approximately 3.3 million

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ambulatory care visits [3]. The estimated global prevalence of hemorrhoids in the general population is around 4.4% [4]. Various studies have been conducted worldwide to evaluate the prevalence and associated factors of hemorrhoids. Notably, the prevalence of hemorrhoids is higher in Australia, standing at 38.93%, followed by Israel at 16%, and South Korea at 14.4% [5 7]. It is characterized by the inflammation and swelling of the vascular structures in the anal canal, leading to various degrees of discomfort, pain, and rectal bleeding [8]. Based on their severity, hemorrhoids are classified into four grades, with grade II and III representing mild to moderate stages. While grade II hemorrhoids involve minimal prolapse and bleeding, grade III hemorrhoids exhibit prolapse during bowel movements, necessitating manual reduction. The management of hemorrhoidal disease has evolved over the years, with treatment options ranging from conservative measures to surgical interventions [9]. Traditional surgical techniques, such as hemorrhoidectomy, have been effective but often associated with significant postoperative pain, extended hospital stays, and longer recovery periods. As a result, researchers have explored minimally invasive alternatives to improve patient outcomes and enhance the overall experience (10,11). One such minimally invasive approach gaining popularity is laser hemorrhoidoplasty, a procedure that utilizes laser energy to coagulate the blood vessels supplying the hemorrhoids. The thermal energy from the laser seals off the blood vessels, leading to reduced blood flow and eventual shrinkage of the hemorrhoidal tissue. The technique has shown promising results in terms of decreased postoperative pain, shorter hospital stays, and faster recovery times compared to conventional surgical methods[12,13]. In the context of laser hemorrhoidoplasty, the experience and outcomes in Bangladesh provide valuable insights into its efficacy and safety. In recent years, laser hemorrhoidoplasty has shown encouraging results in various clinical settings, but its application and efficacy in grade II and III hemorrhoidal disease warrant further investigation. With an increasing demand for minimally invasive procedures, understanding the short-term benefits and limitations of laser hemorrhoidoplasty can aid clinicians in making informed decisions regarding treatment options for their patients[14,15,16]. The following sections will provide a comprehensive analysis of the methods employed in this study, the results obtained, and the concluding remarks on the potential role of laser hemorrhoidoplasty in the management of grade II and III hemorrhoids. Additionally, the implications of these findings for future research and clinical practice will be discussed, highlighting the significance of this study in advancing the field of hemorrhoidal disease management.

Materials and Methods

This study is a retrospective non-randomized analysis conducted at Anower Khan Modern Hospital to assess the short-term outcome of laser hemorrhoidoplasty for grade II and III hemorrhoidal disease. The study duration covers patients who underwent the laser hemorrhoidoplasty procedure from March 2019 to April 2023. A total of 255 patients were included in the analysis. Patient Selection and Data Collection: Patients who underwent laser hemorrhoidoplasty during the specified period were selected for inclusion in the study. The medical records of these patients were thoroughly reviewed to gather relevant information for analysis. Patients with incomplete medical records were excluded from the study. The three primary symptoms of hemorrhoids, namely pain, bleeding, and prolapse, were considered as criteria for patient selection. Procedure Details: All laser hemorrhoidoplasty procedures were conducted at Anower Khan Modern Hospital.

Before the procedure, patients received intravenous Augmentin 1.2g for infection prevention. Anesthesia was administered in the form of either general or spinal anesthesia based on individual patient requirements.

The patient was positioned in a lithotomy position on the operation table. The procedure commenced with the preparation of the anus, prolapsed hemorrhoid, and the surrounding area using povidone iodine. A rectal examination was performed by the surgeon to assess for anal fissure, fistula, or any other anomalies.

Subsequently, a proctoscope lubricated with lignocaine gel was inserted into the anal canal for further examination of hemorrhoid location and the presence of fistula or growths. The surgeon then sutured the hemorrhoid at its pedicle using Ethicon Coated Vicryl Polyglactin 910 size 3-0 to minimize bleeding during the procedure. Following this, a local anesthetic solution containing Marcain 0.5% with adrenaline was injected into the skin of the anal opening.

Laser Hemorrhoidoplasty: The laser hemorrhoidoplasty procedures were performed using an Lasotronix1470 diode laser machine with a wavelength of 1470nm. The laser machine delivered 7 W pulses of 3 seconds each into the hemorrhoidal tissue. The surgeon guided the laser fiber probe through the submucosa layer of the anal canal until it reached the hemorrhoid tissue's pedicle, with the aid of the aiming beam at the fiber's tip.

Figure 1: Laser Hemorrhoidoplasty Procedure

The surgeon adjusted the angle of the probe to ensure the brightness of the aiming beam was optimal, neither too bright nor too dim, to reduce the risk of ulcers. Once the location and angle of the aiming beam were confirmed, the surgeon activated the laser beam by pressing the foot pedal continuously until it stopped automatically at 3 seconds, constituting one pulse. The surface of the treated hemorrhoids was cooled using a cold gauze for approximately 30 seconds to preventthermal injury and edema. The laser probe was reinserted into the same hemorrhoid at different directions and lengths, delivering additional pulses until the hemorrhoidal tissue felt firmer, less bluish, and started to reduce in size. The same procedure was repeated for other hemorrhoids as required.

Post-procedure Assessment and Follow-up: The duration of the entire laser hemorrhoidoplasty procedure was recorded. Within the first day after the procedure, patients' post-procedure pain scores were assessed using the verbal numerical rating score (VNRS). The duration of hospitalization post-procedure was also noted. For follow-up, complications of the procedure within 6 weeks were recorded, including hematoma, ulcer, abscess, recurrence, and fissure.

Result

A total of 255 patients (85 males, 170 females) with a median age of 37 years old (range 18-66 years old) who done laser hemorrhoidoplasty procedure in Anower Khan Modern Hospital, Dhaka, Bangladesh, spanning from March 2019 to April 2023 were enrolled in our study. Out of 255 patients, 105 patients (41.17%) suffered from grade II hemorrhoids, 150 patients (58.83%) had grade III hemorrhoids. It is as shown in Table 1.

Table 1- Type and Grading classification of the study population (n=255)

Type/Grade of hemorrhoids	Frequency (n)	Percentage (%)
Grade II	105	41.17
Grade III	150	58.83

Table 1 shows that 105 patients (41.17%) suffered from grade II hemorrhoids and 150 patients (58.83%) had grade III hemorrhoids.

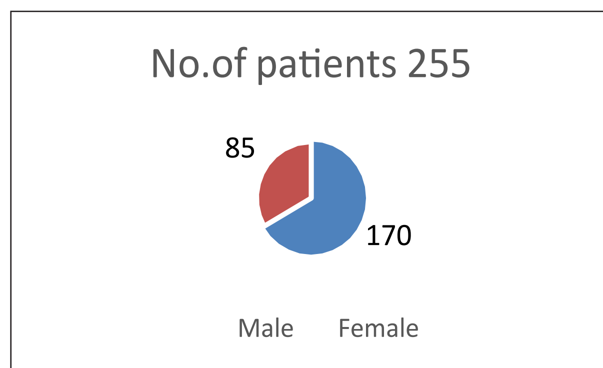

Figure 2:Characteristics of Patients

Table 2- Symptoms of hemorrhoids at presentation of the study population (n=255)

Symptoms of hemorrhoids at presentation	Frequency (n)	Percentage (%)
Pain	62	24.31
Bleeding	54	21.18
Prolapse	92	36.08

Table 2 shows the symptoms observed during the initial presentation. Among the patients, bleeding was the most frequently reported symptom, with 54 individuals (21.18%) experiencing it. Mucosal prolapse followed closely, with 92 patients (36.08%) presenting this symptom. Pain was reported by 62 patients (24.31%) as well.

Table 3- Operative data of the study population (n=255)

Mean operating time (min), Mean +/- sd (range)	15 ±10
Mean hospital stay (hours), Mean +/- sd (range)	24.35 ± 1.23
Healing times (days) Mean +/- sd (range)	14.03 ± 12.04

Table 3 shows the operative data of the study population (n=255). Among the these, Mean operating time (min) was 15 ±10, Mean hospital stay (hours) was 24.35 ± 1.23 and Healing times (days) was 14.03 ± 12.04 .

Table 4- Complications within 6 weeks follow-up post-laser hemorrhoidoplasty procedures of the study population (n=255)

Symptoms of hemorrhoids at presentation	Frequency (n)	Percentage (%)
No complications	204	82.75
Hematoma	9	3.54
Ulcer	4	1.57
Abscess	3	1.18
Recurrence	4	1.57
Fissure	2	0.78

Table 2 shows the Complications within 6 weeks follow-up post-laser hemorrhoidoplasty procedures of the study population (n=255). Majority patients (n=204, 82.75%) have no complications at all, while the remaining patients presented with complications. The most frequent reported complication was hematoma (n=9, 3.54%), followed by ulcer and recurrence (n=4, 1.57% respectively), abscess (n=3, 1.18%) and the least reported complication was fissure (n=2, 0.78%). However, most complications can be managed as outpatients and were resolved within 6 weeks post procedure.

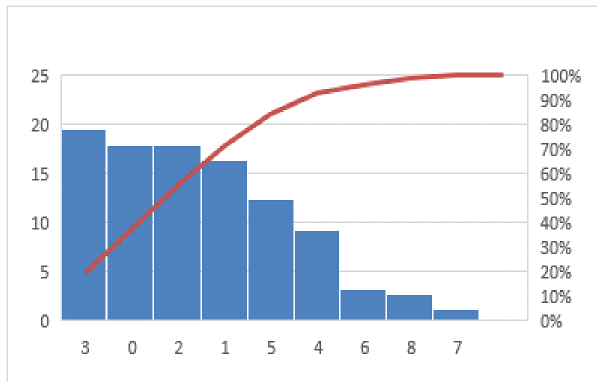

Figure 3: The mean pain responses of patients:- Postoperative pain score within first 24 hours by using Verbal Numerical Rating Score (VNRS).

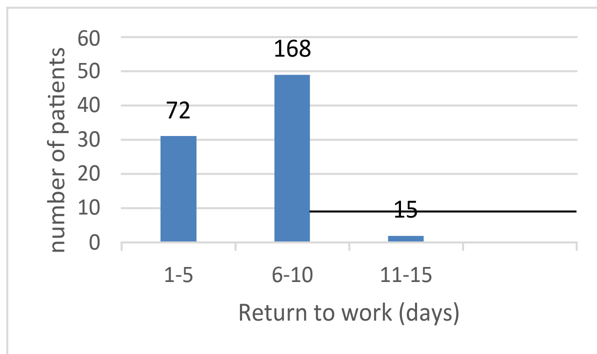

Figure 4: Return to Work (days):

Discussion

The present study aimed to evaluate the short-term outcome of laser hemorrhoidoplasty in grade II and III hemorrhoidal disease. Laser hemorrhoidoplasty has emerged as a promising alternative to traditional surgical techniques, offering reduced postoperative pain and faster recovery times . The findings from this single-institution experience at Anower Khan Modern Hospital provide valuable insights into the efficacy and safety of laser hemorrhoidoplasty for managing hemorrhoidal disease.

The study results demonstrated encouraging outcomes for laser hemorrhoidoplasty in grade II and III hemorrhoidal disease. Among the 255 patients who underwent the procedure, 41.17% had grade II hemorrhoids, and 58.83% had grade III hemorrhoids . The procedure's efficacy was evaluated based on symptom relief and post-procedure complications.

Laser hemorrhoidoplasty showed effective symptom relief for patients with hemorrhoidal disease. The most common symptoms at presentation were bleeding (21.18%) and mucosal prolapse (36.08%). These symptoms improved significantly after the procedure, as reported in the follow-up assessments. A vast majority of patients (82.75%) experienced no complications within the 6-week post-procedure period, indicating effective relief from bleeding and prolapse.

The study reported a relatively low rate of complications, with most being minor and manageable as outpatients.

The most frequent complication was hematoma (3.54%), followed by ulcer and recurrence (1.57% each), abscess (1.18%), and fissure (0.78%). However, it is important to note that most complications were resolved within 6 weeks post-procedure. These results align with previous studies evaluating the safety of laser hemorrhoidoplasty.

The low rate of complications supports the notion that laser hemorrhoidoplasty is a safe and viable treatment option for grade II and III hemorrhoidal disease. Comparing to other studies, Gendy et al.

conducted a meta-analysis of randomized controlled trials comparing stapled hemorrhoidopexy with conventional hemorrhoidectomy, showing favorable long-term results for stapled hemorrhoidopexy in terms of postoperative pain and recovery ([17]). In another study by Jutabha et al., endoscopic rubber band ligation was compared with bipolar coagulation for chronically bleeding internal hemorrhoids, and both techniques showed similar efficacy in controlling bleeding ([18]). Allegretto and Allegretto evaluated contemporary outpatient hemorrhoidal surgery and reported favorable outcomes with reduced postoperative pain and faster recovery compared

to traditional surgical techniques ([19]). Lohsiriwat's study on hemorrhoids provided insights into the basic pathophysiology and clinical management, highlighting the importance of exploring minimally invasive treatment options ([20]). Li et al. conducted a study on the prevalence of hemorrhoids among adults in rural areas of Xi'an, China, shedding light on the burden of the disease in different populations ([21]). Ip et al. conducted a population-based study in Hong Kong, revealing the prevalence of colorectal diseases, including hemorrhoids, in the region ([22]). These studies collectively emphasize the significance of exploring safe and effective treatment options for hemorrhoidal disease. The mean operating time for laser hemorrhoidoplasty was 15 ± 10 minutes,

indicating that the procedure can be performed efficiently and with minimal invasiveness ([23]). Additionally, the mean hospital stay was 24.35 ± 1.23 hours, further highlighting the outpatient or day-care potential of laser hemorrhoidoplasty. These findings are consistent with other studies showing shorter operating times and hospital stays for laser hemorrhoidoplasty compared to conventional surgical techniques.

The shorter hospital stay can lead to cost savings and improved patient satisfaction. The findings from this study provide valuable insights into the short-term efficacy and safety of laser hemorrhoidoplasty in grade II and III hemorrhoidal disease. However, several limitations need to be addressed for future reseach and clinical applications.This study has some limitations that should be acknowledged. The study's retrospective design might introduce selection bias and limit the generalizability of the findings. Future studies with larger, multicenter cohorts are necessary to validate the findings and ensure broader applicability. While the study focused on short-term outcomes, the long-term efficacy of laser hemorrhoidoplasty remains an important aspect to explore. Future research with extended follow-up periods is essential to assess the procedure's durability in providing symptom relief and preventing recurrence. Comparative studies comparing laser hemorrhoidoplasty with other treatment modalities, such as hemorrhoidectomy and hemorrhoidal artery ligation, would be valuable to establish its superiority and role in the management algorithm ([24]). For example, Guan et al. compared surgical intervention for grade III hemorrhoids and found that stapled hemorrhoidopexy had advantages over Milligan-Morgan hemorrhoidectomy in terms of less postoperative pain and faster recovery ([24]). The inclusion of patient-reported outcomes, such as quality of life assessments and patient satisfaction surveys, would provide a comprehensive understanding of the impact of laser hemorrhoidoplasty on patients' well-being ([25]).

Conclusion

Laser hemorrhoidoplasty demonstrated promising short-term outcomes for grade II and III hemorrhoidal disease, with effective symptom relief and minimal postoperative discomfort. The study results support the use of laser hemorrhoidoplasty as a safe and efficient alternative treatment. However, further research with larger cohorts and longer follow-up periods is necessary to validate its efficacy and safety for broader clinical application. Comparative studies with other treatment modalities can help establish its role in the management algorithm. Overall, laser hemorrhoidoplasty shows potential as a valuable addition to the spectrum of treatment options for grade II and III hemorrhoidal disease, offering reduced postoperative pain and faster recovery times compared to traditional surgical techniques.

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