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Laser Hemorrhoidoplasty for Symptomatic Hemorrhoids

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Abstract

Introduction and Aim: Hemorrhoids disease is the commonest disease of the rectum and anal canal. The worldwide prevalence ranges from 2.9% to 27.9%, of which more than 4% are symptomatic. Bleeding from the rectum which is painless and associated with episodes of defecation is the most common complaint by patients with hemorrhoids. Multiple treatment options for symptomatic hemorrhoids are available worldwide which includes conservative medical management with dietary modifications and topical therapy using emollients, non-surgical treatments and various surgical techniques. But most of these surgical procedures are associated with significant postoperative pain, delayed return to normal activities and readmissions, that's why the surgeons are shifting to minimally invasive laser therapy for symptomatic hemorrhoids as laser hemorrhoidoplasty is associated with less postoperative pain, shorter operative time and early return to work. The aim of this study was to evaluate the clinical results of Laser Hemorrhoidoplasty for symptomatic hemorrhoids.

Materials and Methods: This is a retrospective single center observational study of 70 patients who underwent laser hemorrhoidoplasty for symptomatic hemorrhoids in a period of 20 months between June 2021 to January 2023. All the laser hemorrhoidoplasty procedures were done by me personally at Phoenix Hospital Abu Dhabi, United Arab Emirates. Patients with symptomatic haemorrhoids of grade II - IV were included in the study. The patients were followed up after 1 week, 3 week and 3 months for the evaluation of clinical results.

Results: Most of the patients are in the age group of 24 - 47 years. In the study male patients were found to be more 90% as compared to female 10%. The most common severity of disease presentation was grade three (71.5%) followed by grade four (18%) then grade two (10.5%). The average operative time observed for the laser hemorrhoidoplasty was 34 minutes and the mean hospital stay was 18 hours. Postoperatively on the 1st day 93% of patients developed mild pain after the procedure, only 7% of the patients have moderate to severe pain. Postoperatively after one week around 60% of the patients have mild pain and discomfort on defecation only, although 40% of the patients have no pain at all. At three week time only 5% of the patients have mild discomfort on defecation only, no patient have actual pain at this time. Post laser hemorrhoidoplasty mild bleeding in the form of spotting after defecation was seen in 60% of patients but only 12% continued spotting till one week, 35% of the patients had no bleeding after the procedure at all. No patient had bleeding complain at the three week time.

Conclusion: Our study demonstrated that the minimally invasive Laser hemorrhoidoplasty (LHP) technique for the management of hemorrhoids is associated with shorter operative time, less postoperative pain and bleeding, has the advantage of short hospital stay and faster recovery. However Larger randomized long term studies are required to demonstrate the exact recurrence rates and patient satisfaction.

Keywords: *Laser Hemorrhoidoplasty (LHP); Symptomatic Hemorrhoids*

Introduction

Hemorrhoids disease is the commonest disease of the rectum and anal canal. The worldwide prevalence ranges from 2.9% to 27.9%, of which more than 4% are symptomatic [1,2]. The prevalence of hemorrhoids increases with age, with a peak incidence in persons aged 45 - 65 years with subsequent decline after 65 years [3,4]. Men are more frequently affected than women [5].

Hemorrhoids are basically anorectal submucosal vascular cushions which turn out to be pathological giving rise to bleeding, pain and protrusion outside the anal canal. Hemorrhoids can both be external and internal based upon whether they are below or above the dentate line, while internal hemorrhoids arise from the subepithelial plexus in the anal canal above the dentate line, external hemorrhoids are vascular plexuses present outside and covered with skin [6]. Internal hemorrhoids can be classified into four grades according to the degree of prolapse although the symptoms may not be conducive with the extent or severity of patients' sufferings [7]. Hemorrhoids may have varied clinical presentations such as bleeding, pain, mucus discharge, itching and something coming out of the rectum [8]. Bleeding from the rectum which is painless and associated with episodes of defecation, is the most common complaint by patients with hemorrhoids. The severity can lead to continuous severe bleeding and anemia, thrombosed hemorrhoids, prolapsed with edema, or strangulation.

The exact cause of hemorrhoids is unknown. Hemorrhoids are considered to be due to the downward displacement of suspensory (Treitz) muscle [9,10]. A lot of pressure is put on human rectal veins due to our upright posture, which can potentially cause bulging. Other contributing factors include aging, chronic constipation or diarrhea, Pregnancy, Heredity, Straining during bowel movements.

Multiple treatment options for symptomatic hemorrhoids are available worldwide which includes conservative medical management with dietary modifications and topical therapy using emollients, non-surgical treatments and various surgical techniques. The various non-surgical treatments include rubber band ligation, injection sclerotherapy, cryotherapy, infrared coagulation and diathermy coagulation, all of which may be performed as outpatient procedures without anaesthesia. These nonsurgical methods are considered to be the primary option for grades one to three (grade I-III) hemorrhoids [11]. If conservative measures fail to control symptoms, should be considered for surgical treatment. These procedures include ligation, fixation, excision, or a combination of these approaches. Because most internal hemorrhoid symptoms are due to tissue prolapse, ligation and fixation procedures effectively scar the mucosa to the underlying sphincter so tissue can no longer prolapse.

The technique employed may be open (Milligan-Morgan) or closed (Ferguson). Milligan-Morgan hemorrhoidectomy is still the gold standard and frequently performed procedure for symptomatic hemorrhoids [12]. However, the technique is associated with significant postoperative pain leading to delayed return to normal activities and readmissions. Other techniques of hemorrhoid surgery involve using devices such as stapler or Doppler guided transanal hemorrhoid ligation or procedures such as laser therapy. The pain is the commonest postoperative problem associated with the surgical techniques. The other early complications are bleeding, urinary retention and subcutaneous abscess. The long-term complications include anal fissure, anal stenosis, incontinence, fistula and recurrence of hemorrhoids [13,14].

Because of the significant postoperative pain, delayed return to normal activities and readmissions, the surgeons are shifting to minimally invasive laser therapy for symptomatic hemorrhoids, as laser hemorrhoidoplasty is associated with less postoperative pain, shorter operative time and early return to work [15].

Laser hemorrhoidoplasty is a relatively emerging new procedure in UAE for hemorrhoid treatment in which the hemorrhoidal blood flow is coagulated by the laser. Due to an intense amount of heat, the laser beam cauterizes and seals off the blood vessels, therefore the hemorrhoids will simply shrink while reducing the risk of excessive bleeding during and after the procedure. However, against all the

benefits, specific training and precaution measurements are required to use the laser therapy. However, surgeons must use the goggles to protect their eyes from invisible radiations produced by laser [16,17].

Materials and Methods

This is a retrospective single center observational study of 70 patients who underwent laser hemorrhoidoplasty for symptomatic hemorrhoids in a period of 20 months between June 2021 to January 2023. All the laser hemorrhoidoplasty procedures were done by me personally with the help of a nursing assistant in Phoenix Hospital Abu Dhabi, United Arab Emirates. Phoenix hospital is a 50 bed private hospital and I am working here as a specialist general surgeon with seventeen years experience of post fellowship in general surgery. Patients with symptomatic hemorrhoids of grade II - IV were included in the study. The diagnosis was established in OPD with a full history, physical examination, per rectal examination and proctoscopy. Routine preoperative investigations which were performed include complete blood count, random blood sugar, serum creatinine, urine analysis and coagulation profile with addition of chest X-ray and ECG for the patients above the age of 40 years. The two most common symptoms of patients' presentation were bleeding and intermittent prolapse with defecation. An Informed written consent was obtained from the patients after detailed explanation about the laser technique and potential risks of the procedure. All the patients were given pre-operative prophylactic antibiotic with Single dose of cefuroxime (1.5 gm) and metronidazole (500 mg) intravenously 30 minutes before the surgery. The operation was performed under spinal anesthesia in lithotomy position. In the operative technique used for procedure, lubricated split proctoscope was introduced into the anus and the hemorrhoid positions identified at all three columns. Prior to laser therapy 5 - 7 ml of normal saline injected in the sub-mucosal plane up to the dentate line through a puncture at the mucocutaneous junction to avoid injury to the surrounding structures. The laser fiber probe was introduced into the middle portion of the hemorrhoidal plexus through the same entry point at the mucocutaneous junction and advanced in the hemorrhoidal plexus parallel to the anal canal up to above the dentate line. Then the laser fiber withdrawn gradually by delivering the laser shots in a pulse fashion at a power of 8W with the duration of 3s each shot followed by a pause of 1s (Swing 12 Metrum cryoflex diode laser conical fiber 1470 nm was used), again the laser fiber advanced in the hemorrhoidal plexus parallel to the anal canal up to above the dentate line in the upper direction and lower direction respectively and withdrawn gradually by delivering the laser shots in the hemorrhoidal plexus. Total of 10 - 12 shots of laser was delivered to one hemorrhoidal plexus. After the laser shots an ice finger was applied intra anally for 3 - 4 minutes to minimize the harmful effect of heat. This procedure was repeated for each hemorrhoid. The total energy given to all hemorrhoids ranged from 600 to 1500 joules depending on the number and size of the hemorrhoids. At the end of the procedure bleeding checked and lidocaine soaked anal pack was placed in the anal canal which was removed after 12 hours with sitz bath. The patient was discharged home within 12 - 24 hours with local lubricant cream, analgesics and laxatives to keep the stool soft for next one week. The patients were followed up after 1 week, 3 week and 3 months. Postoperative pain was observed by using a 10-point visual analog scale (VAS) on which 0 represents no pain and 10 represents the worst pain imaginable.

Results

A total number of 70 patients were included in this study that underwent laser hemorrhoidoplasty for symptomatic hemorrhoids in a period of 20 months from June 2021 to January 2023. Most of the patients are in the age group of 24 - 47 years, ranging from 21 to 64 years. In the study male patients were found to be more (63) 90% as compared to female (7) 10%. The most common severity of disease presentation was grade three (71.5%) followed by grade four (18%) then grade two (10.5%). The average operative time observed for the laser hemorrhoidoplasty was 34 minutes, ranging from 22 to 50 minutes and the mean hospital stay was 18 hours, ranging from 12 to 24 hours (majority of the patients got discharged within 18 hours). All the patients were followed up in outpatient department after 1 week, 3 week and 3 months. Postoperative pain was observed by using a 10-point visual analog scale (VAS) on which 0 represents no pain and 10 represents the worst pain imaginable.

Postoperatively on the 1st day 93% of patients developed mild pain after the procedure, 7% of the patients have moderate to severe pain controlled by injectable analgesia which replaced by oral analgesia at the time of discharge from hospital. Postoperatively after one

week around 60% of the patients have mild pain and discomfort on defecation only, although 40% of the patients have no pain at all. At three week time only 5% of the patients have mild discomfort on defecation only, no patient have actual pain at this time.

Post laser hemorrhoidoplasty mild bleeding in the form of spotting after defecation was seen in 60% of patients but only 12% continued spotting till one week, 35% of the patients had no bleeding after the procedure at all, although two of the patients have moderate bleeding on the first day which was managed conservatively by packing only, one patient presented in emergency department after one week with severe bleeding and clots which was also managed by packing conservatively. No patient had bleeding complain at the three week time.

No patients developed any infection, anal fistula, stenosis or fecal incontinence after laser procedure this study. Although 4 patients developed urinary retention after laser procedure which was relieved by Foleys catheterization and 10% of the patients have mild constipation up to 1 - 2 week time which was managed by oral laxatives.

At the 3 months visit time 60% of the patient did not follow up, but out of remaining 40% of the patients only one patient had recurrence as second degree hemorrhoids, no patient had history of bleeding, pain, stenosis or incontinence at this time.

Discussion

Hemorrhoids disease is the commonest disease of the rectum and anal canal. The worldwide prevalence ranges from 2.9% to 27.9%, of which more than 4% are symptomatic [1,2]. Hemorrhoids may have varied clinical presentations such as bleeding, pain, mucus discharge, itching and something coming out of the rectum [8]. The severity can lead to continuous severe bleeding and anemia, thrombosed hemorrhoids, prolapsed with edema, or strangulation.

There are many methods of HD treatment ranging from conservative, band ligation, sclerotherapy, stapled hemorrhoidopexy, Doppler guided transanal hemorrhoid artery ligation (THD), laser photocoagulation to Milligan Morgan (MM). MM is still the gold standard and most frequently used procedure with respect to long term patient outcomes [18,19]. However, compared with the less invasive methods of treatment, its use is associated with high post-operative pain scores and slower return to work [19,20]. Laser hemorrhoidoplasty is a relatively emerging new procedure with less postoperative pain, shorter operative time and early return to work [15]. In this retrospective study also, we noticed remarkably good results in terms of postoperative pain, operative time and early return to work.

Postoperatively on the 1st day 93% of patients developed mild pain, 7% of the patients have moderate to severe pain, postoperatively after one week 60% of the patients have mild pain and discomfort on defecation, although 40% of the patients have no pain at all after one week. At three week time only 5% of the patients have mild discomfort on defecation only, which is almost consistent with Abdallah Abdulkarim study from Aga khan hospital which showed 85.7% of the patients had mild pain scores after LHP, 4.8% of patients had moderate pain score and 9.5% had severe pain scores [15]. In another study by Masson, hemorrhoidectomy with lasers is known to cause less postoperative pain compared to other surgical methods such as open hemorrhoidectomy [21].

The average operative time observed for the laser hemorrhoidoplasty in this study was 34 minutes, which is near to the results of Abdallah Abdulkarim which showed mean operative times of 29.67 minutes [15] which is also explained by Simillis., *et al*. and Alsisy., *et al*. where the authors noted decreased operative time when comparing laser hemorrhoidoplasty to open hemorrhoidectomy [19].

Postoperatively duration of hospital was ranging from 12 to 24 hours (majority of the patients got discharged within 18 hours) which is similar to the many other studies like by Sankar MY, the lower length of hospitalization in the laser group was significant [22].

In our study mild bleeding in the form of spotting after defecation was seen in 60% of patients but only 16% continued spotting till one week, 35% of the patients had no bleeding after the procedure at all. In laser hemorrhoidoplasty the post-operative bleeding is very less

as seen in our study and also mentioned by Jahanshahi., *et al*. who reported that laser is a safe technique for the treatment of hemorrhoids due to less postoperative complications such as bleeding, pain, stenosis, and recurrence [23]. Shu YU Lim also revealed in his study that postoperative bleeding rarely occurred in the post-operative period of 6 weeks [24].

The other postoperative complications like delayed bleeding, anal fistula, acute infection, anal fissure, anal stenosis or incontinence were not observed in any of our patients within three months after surgery. There was no recurrence of the disease during the three months and a complete remission was observed in all cases and also no patient from our study required redo operation. In this study, one patient developed thrombosis three days after the laser surgery that was successfully treated with medications. Two patients had early postoperative urine retention that was managed by insertion of Foley's catheter.

The patient with laser hemorrhoidoplasty recovers easily and early as seen in our study, and also mentioned in the study by Sankar, postoperative recovery period was significantly lower than other surgical procedures such as open surgery [22]. LHP is a relatively new technique for the hemorrhoidal treatment and the surgeons are still in the learning curve. Despite that, the early outcomes of LHP are satisfactory in terms of postoperative bleeding, pain and recurrence. Larger randomized long term studies are required to demonstrate the exact recurrence rates and patient satisfaction.

Limitation of the Study

Limitations in our study include the short period of follow up and there was no direct comparison done to other techniques like gold standard open Milligan Morgan surgery.

Conclusion

Our study demonstrated that the minimally invasive Laser hemorrhoidoplasty (LHP) technique for the management of hemorrhoids is associated with shorter operative time, less postoperative pain and bleeding, has the advantage of short hospital stay and faster recovery. However Larger randomized long term studies are required to demonstrate the exact recurrence rates and patient satisfaction.

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