Section: Surgery

Original Research Article

ANALYSIS OF LASER TREATMENT AS A NEW MODALITY FOR THE TREATMENT OF PRIMARY PILONIDAL SINUS AT A TERTIARY CARE CENTER

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ABSTRACT

Background: Pilonidal sinus is a pathology that occurs due to acute or chronic infection of the natal cleft, particularly in young men. To avoid complications and recurrence rates following the pilonidal sinus excision, it is desirable to use a less invasive technique that allows patients to recover more quickly and permanently. The present study was aimed to evaluate laser Pilonidotomy, a recent advanced technique for the treatment of pilonidal sinus.
Materials and Methods: The present study was conducted on 35 patients who were diagnosed with pilonidal sinus disease in the surgical OPD and underwent laser pilonidotomy after giving a consent form.
Results: Male patients (88.57%) were far more than female patients (11.43%). Mean duration of procedure was 30.34 ± 8.24 minutes, mean duration of hospital stay was 14.65± 7.13 hours. Most of patients resumed normal activity in 1.96 ± 0.81 days while complete wound healing by secondary intention was noted after 4.5 ± 1.2 weeks. Successful primary treatment was done in 91.43 %. Recurrence was noted in 2 patients (5.71 %). Infection (5.71 %) was noted in 2 patients, less common complications were bleeding (8.75 %), severe postoperative pain (5.71 %), hypertrophic scar (2.85 %). VAS score analysis was done and a significant change in VAS score was noted between day 1 and day 7.
Conclusion: Laser treatment in primary pilonidal disease is minimal invasive surgery, is easy to perform with major advantages such as shorter hospital stay, less post-operative pain and care and the final aesthetic appearance of the patient.
Keywords: Laser treatment, primary pilonidal disease, minimal invasive surgery, shorter hospital stay.

INTRODUCTION

Pilonidal sinus is a pathology that occurs due to acute or chronic infection of the natal cleft, particularly in younger population. It is, however, more common in young adult men, a population with an incidence of 1.1%. Pilonidal sinus is a result of a foreign body reaction which is stimulated due to penetration of surrounding bristles into natal cleft. It is more common in the late 20s and early 30s. The underlying pathophysiologic feature is the enlargement of hair follicles due to midline vacuum and pulling forces. When plugged with hair or keratin, the follicles rupture, leading to a foreign-body reaction within the presacral subcutaneous tissue and subsequent acute and chronic abscess.[1] The familial tendency and genetic predisposition have also been reported as the etiological factors of this condition. The condition is usually seen in association with obesity, hirsute individuals, profuse sweating and sedentary lifestyle. Local irritation or trauma has also been reported as contributing factor.[2] The diagnosis of pilonidal sinus is established by finding a characteristic sinus lined by epithelialized tract present in the natal cleft a short distance from anus and having hairs as its

constituents. A deep abscess cavity with surrounding moist conditions and abundant bacteria, hair, debris and friction can cause recurrent infection alongwith associated with chronic pain and discharge.3 In order to decrease complications and recurrence rates after pilonidal sinus excision, it is desirable to use a less invasive technique that allows patients to recover more quickly and permanently.4The present study was aimed to evaluate laser Pilonidotomy, a new technique for the treatment of pilonidal sinus.

MATERIALS AND METHODS

The present study prospective, observational study was conducted at Department of Surgery, MMCMSR, Sadopur Ambala (Haryana) from February 2024 to October 2024 after receiving approval from institutional ethical committee to conduct this study.

Inclusion Criteria: Patients who were diagnosed as cases of pilonidal sinus disease in the surgical OPD. These patients were informed about the study and an informed consent was taken for follow up after they underwent laser pilonidotomy.

Exclusion Criteria: Patients with Recurrent pilonidal sinus**,** Pilonidal Sinus abscess with Human immunodeficiency virus positive patients, Patients on cancer chemotherapeutic drugs or immunosuppressant therapy and uncooperative or mentally ill patients were excluded from the study.

All patients were evaluated by history taking and clinical examination including digital rectal examination. Routine investigations such as CBC, blood urea, blood sugar, LFT, coagulation profile were done in each patient. If required ECG and X ray chest were done. An informed consent was taken before surgery. Preoperatively shaving of the back was done to provide a clean and sterile field. Laser pilonidotomy was the procedure planned for all patients which was explained to the patients in local language. All cases were performed under local anaesthesia, in Jackknife position. All the pits and associated abscess cavities were identified. Crisscross incision was taken over the abscess cavity and debridement done at 8W power with 1470 nm diode laser, providing an energy of 100 J per centimeter, till the entire length was debrided. The cavity was flushed with normal saline and hydrogen peroxide. A crisscross incision at natal cleft was taken for drainage through the pit. If the Pilonidal Sinus was more than 4 cm long, additional crisscross incision in the centre of the sinus tract was taken to prevent collection in the recovery period. Wound was kept open for drainage. Follow up of each of the included patient was done at 1 week, 2 weeks and 4-6 weeks. The parameters evaluated were operation time, healing time, the duration of hospitalization, the degree of postoperative complications and rate of recurrence. VAS score was used to evaluate pain on day 1 and day 7. All study subjects were followed for 12 months. The data collected was analyzed using statistical package SPSS (version 25). Statistical analysis was done using descriptive statistics. Chi-square test was used as test of significance for qualitative data. P value of <0.05 was considered as statistically significant.

RESULTS

Total 35 patients underwent laser pilonidotomy. The mean age of the patients included in the study was found to be 30.32± 8.49 years. The number of male patients (88.57%) was far more than female patients (11.43%). The mean duration of procedure was 30.34 ± 8.24 minutes, mean duration of hospital stay was 14.65 ± 7.13 hours. Most of patients resumed their normal activities within in 1.96 ± 0.81 days while complete wound healing by secondary intention was noted after 4.5 ± 1.2 weeks. Successful primary treatment was done in 91.43 %. However, recurrence was noted in 2 patients (5.71%). Infection (5.71%) was noted in 2 patients, less common complications were bleeding (8.57 %), severe postoperative pain (5.71 %), hypertrophic scar (2.85 %). No dehiscence or tip necrosis was noted in any of the study cases.

Table 1: Patient and operative characteristics

Characteristics	No. of cases		Percentage	
Gender	Male	Female	Male	Female
	31	4	88.57	11.43
Wound complications				
Infection	2		5.71	
Bleeding	3		8.57	
Severe post-operative pain	2		5.71	
Hypertrophic scar	1		2.85	
Recurrence	2		5.71	
Successful primary treatment	32		91.43	

VAS score analysis was done and a significant change in VAS score was noted between day 1 and day 7.

Table 2: VAS score analysis

Pre-operative	Mean ±SD	p-Value
Day 1	7.11±1.15	<0.0001
Day 7	3.93±0.93	
Mean±SD	1.96±0.54	

DISCUSSION

Patients presenting with pilonidal sinus are typically in their middle to late 20s and have had symptoms for 4 to 5 years at initial presentation.[8] The onset of disease in adolescent can be correlated with pubertal hormonal effect as well as skin and hair changes. Excessive hair growth has a pivotal pathogenetic role due to the penetration of broken terminal hairs into the subcutaneous tissue with subsequent development of inflammatory granuloma which could lead to potential secondary infection. Discomfort and pain are common symptoms seen after debridement without skin closure and marsupialization. This procedure requires repeated change of dressing which results in delayed healing.[5] Excision of pilonidal sinus and primary midline closure has high rates of recurrence, infection and longer hospitalization.[6] Many surgical methods have been tried over the period for treatment of this pathology ranging from the simple incision, drainage, unroofing, curettage and spontaneous secondary healing to excision-flap sliding, Karydakis, Bascom, and MacFee methods. The standard treatment for pilonidal sinus (PNS) is surgical intervention with excision of sinus. Although surgical intervention is acutely effective, the recurrence of pilonidal sinus is high.[4] The aim of laser treatment is to use high energy at the tip of the probe to destroy the squamous epithelium of the pilonidal sinus and induce contraction/ obliteration of the tract.[7] Laser pilonidoplasty is a simple, reasonable, feasible, minimal invasive, reproducible technique and competitive alternative to other surgical intervention.[8] Ashwin P9 studied laser pilonidotomy in 228 patients. Mean duration of Procedure was 33 ± 11 min, mean duration of Hospital Stay was 12 ± 3 h, resumption of normal activity within 4 ± 2 days, mean duration for Complete Wound Healing by secondary intention 6 ± 1.25 Weeks. Among complications, infection reported in 1.08%. The difference between the mean pre and post-operative VAS score was statistically highly significant ($p < 0.0001$). Recurrence rate was 3.24%. Success rate was 96.75% and Overall patient's satisfaction was 97.84%. Laser Pilonidotomy is effective in destruction of a pilonidal cyst with good success rate, fewer complications and with high patient's satisfaction. Similar findings were noted in present study. Oram et al. reported a 13.3% recurrence rate of pilonidal sinus after a mean number of 2.7 Alexandrite laser treatments. Recurrence rate after excision and primary closure was high (38%) and excision and flap reconstruction provided the best results with a relapse rate of only 7.3%. Therefore, it is attractive to speculate that the choice of surgical technique influences pilonidal sinus recurrence rate.[10] Patil AM studied pilonidal sinus destruction with Neo V Laser Probe.[11] The success rate was 87.5% (35 out of 40 patients). Recurrence rate was 2.9% (1/35). Alferink M et al,[12] studied 50 patients operated with radial laser probe (Sinus Laser-Assisted Closure, SiLaCTM, Biolitec, Germany). The median follow up duration was 120 days. The initial success rate was 92% (45/50). There were no complications during or after surgery. Mean patient satisfaction was 9.0 (3.0 to 10.0). Thirteen percent of patients did not require any analgesia, 37% used only when needed, of which 32% for less than one week and 10% for one to two weeks. In a retrospective series of 40 patients treated with the FILAC™ radial laser probe and documented an 87.5% success rate with 2.9% recurrence. The mean follow-up period was 234 days. Four patients presented with complications: 2 hematomas (5%) and 2 abscesses (5%), which were all medically treated.7 In a meta-analysis and merged-data analysis, recurrence after Limberg/Dufourmentel operations was as low as 0.6% at 12 months and 1.8% at 24 months postoperatively. Recurrence after Karydakis/Bascom procedures was 0.2% at 12 months and 0.6% at 24 months postoperatively. Primary midline closure after 240 months was associated with recurrence rates of 67.9%. CO2 laser able to seal lymphatic and blood vessels up to 1mm diameter and can reduce intraoperative bleeding and the occurrence of postoperative swelling. It also offers more comfort to patients by reducing intraoperative bleeding and postoperative edema, facilitating the process of wound healing after surgery.[12] Major limitations of present study were small sample, relatively short median follow-up duration. A prospective study with larger sample size and longer median follow-up is required to establish recurrence rates more accurately.

CONCLUSION

Laser treatment in primary pilonidal disease is minimal invasive surgery, is easy to perform with major advantages such as shorter hospital stay, less post-operative pain and care and the final aesthetic aspect. It is accompanied by a reduction in pain, early resuming work with decreased rate of recurrence.

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