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Original Research Article

The laser pilonidoplaty

Bhavin Bhuva[1]*, Naresh Chovatiya[1], Shiva Baladaniya[1], Rahul Naik[2]

[1]Star Surat Piles and Colorectal Clinic, Surat, Gujarat, India
[2]Belly and Love Hospital, Surat, Gujarat, India

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***Correspondence:**
Dr. Bhavin Bhuva,
E-mail: drbhavinbhuva@gmail.com

ABSTRACT

Background: The aim of our study was to evaluate the safety, efficacy and clinical outcome of a laser procedure for the treatment of pilonidal sinus. Objectives were to investigate its effectiveness in terms of operation time, healing time, and the duration of hospitalization, resumption of normal activity, the degree of postoperative complications and rate of recurrence patient satisfaction.
Methods: Patients suffering from pilonidal sinus were operated by laser pilonidoplasty at our institute. Laser pilonidoplasty done under spinal anesthesia or local + sedation after a small primary pit excision (0.5-1 cm incision), excision of secondary pits and careful cleaning of the sinus tracts with a curette. After curettage, the laser energy laser set at a wavelength of 1470 nm) was delivered in continuous mode 10 w/sec into the sinus tract f/b saline wash and dressing.
Results: Mean duration of procedure was 35.5 min, mean duration of hospital stay was 1.3 days, mean resumption of normal activity within 8.4 days, mean duration for complete wound healing by secondary intention 29.33 days. Among complications, non-healing ulcer reported in 34% and pain noted in 26%. Recurrence rate was 14%. Success rate was 86% and overall patient's satisfaction was 94%.
Conclusions: Laser pilonidopasty proved to be a safe and effective procedure for treating patients suffering from pilonidal sinus with average success rate, less morbidity, fewer complications with better patient satisfaction rate.

Keywords: Pilonidal sinus, Pilonidal cyst, Laser pilonidoplasty

INTRODUCTION

Pilonidal sinus disease (PSD) is a sacrococcygeal cavity or tract formed by recurrent infection and persistent inflammation.[1] The word is a combination of pilus and nidus; pilus means "hair," and nidus means "nest." The prevalence of pilonidal sinus is 26 people per 100,000.[2] In a 2.2:1 ratio, men are more often infected than women.[3] In studies on pilonidal disease in south India, Rajasekharan et al found that most individuals were in the age category of 16–25 years, with a male-to-female ratio of 2.98:1.[4] After the age of 40, PSD is uncommon.

Pilonidal sinus disease is a chronic inflammation resulting from invasive hair into skin, mostly seen in sacrococcygeal natal cleft and usually presented by inflammation, abscess and sinus formation.[5] During the Second World War, pilonidal disease very commonly appeared in jeep drivers, proctologist Louis Buie described it as, "jeep disease".[6] The prevalence in Asia and Africa is less as compared to Europe and north America.[7]

The familial tendency and genetic predisposition have also been reported. The condition is usually seen associated with obese and hirsute individuals who experience profuse sweating and have a sedentary lifestyle.[6,8-10] Local irritation or trauma has been reported as contributing factor while lack of personal hygiene does not appear to contribute.[11]

Clinical presentation may vary from asymptomatic inflammation, acute abscess to chronic condition characterized by complications like multiple sinus tracts.[5,12,13] It is an acquired condition in which hair, due to movements of the buttock, is invaded into the skin of the natal cleft.[14] The foreign body reaction provoked by the broken or overturned hair leads to hair filled abscess cavity. This folliculitis is characterized by midline pits. During the period of chronic abscess and epithelial tube development from normal hair follicles, the disease may affect more than one follicle and lead to lateral fistulization outside the midline.[15,16] The condition, though not life threatening, is socially embarrassing and adversely affect the quality of life of patients.[5]

The ideal treatment for a pilonidal sinus varies according to the clinical presentation of the disease. The parameter for the treatment choice are the stage of disease, the attitude of the patient toward the disease, patient's compliance and the preference of the surgeon.[14] Apart from many techniques available simple incision, excision, plastic surgery techniques and marsupialization are the most commonly used.[17] It is a stubborn condition, disappointingly so for patient and surgeon alike.

Ideally, the method used to treat the patient should satisfy following goals: wound healing with a low risk of recurrence; short hospitalization; maximal patient comfort; low morbidity, with few wound-management problems; and early resumption to normal daily activity. Laser pilonidoplasty is a new technique where ablation of the sinus tract is done by using radial laser fiber, pits excision done with punch biopsy forceps to prevent collection of fluid and help efficient drainage during saline wash.

METHODS

This retrospective study of consecutive 50 patients operated for laser pilonidoplasty at Star Surat Piles and Colorectal Clinic, Khatodara, Surat in Gujarat during May 2022 to May 2023. The data were collected from the hospital records section and patients during their follow up visits. The data collected was analyzed using the statistical package for the social sciences (SPSS).

All eligible study subjects were categorized as per the classification suggested by Guner et al - stage I: single pit in the midline, no lateral extension; stage II: >1 pits in the midline, no lateral extension; stage IIa: 2–3 pits in the midline; stage IIb: >3 pits in the midline; stage III: Midline pit/pits plus lateral extension in one direction; and stage IV: midline pit/pits plus lateral extension in both directions (stage R: recurrent PSD following any type of treatment).[16]

Inclusion criteria

Patients with midline disease, no active infection (abscess), simple pilonidal sinus, and patients with stage I and II were included.[16]

Exclusion criteria

Patients with <10 year of age, complex pilonidal sinus, pilonidal abscess, and stage III and IV were excluded.[16]

Figure 1: Pre-operative area of pilonidal sinus diseases.

Figure 2: Primary pit + midline pits excision done.

Figure 3: Laser energy delivery.

Laser pilonidoplasty technique

Key steps can be summarized as following. Though evaluation of the lower back to the anal verge. Identify all the pits and associated abscess cavities. Missing one of the branch's sinus tract or abscess cavity is a common cause of recurrence tracing the sinus cavity. Pilonidal sinus primary opening refashion, all pits excision done by punch biopsy forceps. Scooping (curette) of the sinus tract. Saline wash was given. Use radial laser fibre to debride the sinus tract. Keep the setting at 10 W/sec, continuous mode with 1470 nm diode laser. Flush it with cold normal saline. Hemostasis was achieved. Clean and dress was done. The wound is squeezed to drain the collection during follow up. Also it is ensured that the wound do not close prematurely (end of gauze piece inserted at operated site). The post-operative outcome was evaluated in terms of operation time, healing time, and the duration of hospitalization, the degree of postoperative complications and rate of recurrence, and patient satisfaction. overall patient's satisfaction was assessed by using Likert's scale. All study subjects were followed for 12 months.

Follow up

Two times in week for 2 week and very week for a month then monthly for 6 months, 3 monthly for 1 year.

RESULTS

Post-operative follow-up to 3 weeks is very important when premature closure of wound happen, collection and SSI are most common presentation within this period. Non-healing ulcers do not follow the usual healing process and are referred to as chronic wounds should they persist beyond 3 weeks (21 days). Scooping and wash continue at OPD based on these patients.

Table 1: Demographic data of patients.

Age	Male	Female
No. (%)	37 (74)	13 (26)
Mean age (SD)	24.38 (7.6)	

Table 2: BMI relation.

BMI (kg/m^2)	No. of patients	%
<25	8	16
25-30	29	58
>30	13	26
Mean BMI (SD)	27.1 (5.1)	

Table 3: Duration of disease relation.

Duration of complain (days)	No. of patients	%
<30	11	22
30-90	19	38
91-180	13	26
>180	7	14
Mean days (SD)	83.28 (71.1)	

Patients who developed discharge from the surgery site after 12 months from the surgery were labeled as recurrent cases. They were operated again with laser pilonidoplasty under local anesthesia. Eventually they recovered well. All he patients were followed for 12 months.

As per Tables 1-7, out of total 50 cases reported, majority (74%) were male. As per age distribution age group 10–30 has reported maximum number of cases (74%). The minimum age reported was 16 years while maximum age reported was 41 mean age: 24.38 with SD: 7.6. 84% patients were overweight. Mean duration of complaints was 83.28 with range 2 days to 300 days. In most of the cases (84%) there was no history of abscess drainage. Mean duration of procedure was 35.55 min (SD=8.9), duration of hospital stay was 1.3 days (SD=0.5), resumption of normal activity is 8.1 days (SD=3.4), mean duration for complete wound healing by secondary intention was 29.33 days (SD=11.30). Among postoperative complications, infection (6%), collection (16%), non-healing ulcer (34%), pain (26%) and recurrence were reported in 14% of cases. 94% patient satisfied with laser pilonidoplasty.

Table 4: Relation with history of abscess.

Presence of abscess i and d history	No. of patients	%
Yes	8	16
No	42	84

Table 5: Operative outcome.

Variables	Range	Mean	SD
Duration of procedure (min)	23-60	35.52	8.9
Duration of hospital stay (days)	1-3	1.3	0.54
Duration of resumption of work (days)	3-15	8.14	3.4
Complete wound healing by secondary intention (days)	14-65	29.33	11.3

Table 6: Complication relation.

Presence of abscess i and d history	No. of patients	%
Recurrence	7	14
Require secondary laser	6	12
Required alternative method of surgery after laser	4	08
Infection	3	06
Collection	8	16
Non healing ulcer	17	34
Pain	13	26

Table 7: Patient satisfaction index.

Score	No. of patients	%
1	0	0
2	0	0
3	3	06
4	9	18
5	38	76
Total	50	

*Likert scale/score assessment – 1: very dissatisfied; 2: dissatisfied; 3: ok; 4: satisfied; 5: very satisfied

DISCUSSION

There is a definitive trend towards less invasive procedures for the treatment of pilonidal disease, with equivalent or better outcomes compared with classic excision.[18] Laser pilonidoplasty is one of the effective treatment in which he energy delivered by laser causes the destruction of the sinus epithelium and the simultaneous obliteration of the tract.

In our study, the majority (74%) were male. As per age distribution age group 10–30 has reported the maximum number of cases (74%). The minimum age reported was 16 years while maximum age reported was 41, mean age: 24.38 with SD 7.6. Studies conducted by Khan et al, Priyadarshi, and Kement et al showed similar findings.[19-21]

For decades, standard definitive care has consisted of excision with either secondary healing or primary closure of the wound; these approaches were originally derived largely from military hospital experience with "jeep riders' disease".[18,22,23] There are innumerable reported approaches to the surgical management of PNS, raging in complexity from simple drainage to intricately designed multi-flap closures.[16]

A retrospective series of 40 patients treated with the FILACTM radial laser probe between 2014 and 2015 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.[18,24]

The overall recurrence rate was 14%. Of these recurrences, half were treated with another laser procedure while other went on to flap surgery. Complications such as infection (6%), collection (16%), non-healing ulcer (34%), and pain (26%) were noted.

Recurrence is the main concern in the management of PSD. Previously it was thought that the remnant of sinus tract after surgery could be the cause of recurrence in most of the cases but the recent research has stated that it could be related to acquisition of new disease.[25]

Many of the cases of pilonidal sinus disease show a tendency of repeated infection and collection of fluid. Developing postoperative infection and presence of secondary sinus are also risk factors for recurrence.[26.27] In case of recurrence again laser ablation can be done under local anesthesia.

In our study, mean duration of procedure was 35.55 min (SD=8.9), duration of hospital stay was 1.3 days (SD=0.5), resumption of normal activity is 8.1 days (SD=3.4), mean duration for complete wound healing by secondary intention was 29.33 days (SD=11.30). The systematic review conducted by Grabowski et al stated that less invasive procedures are generally preferred by patients over wide excision in terms of time to return to work, overall satisfaction, and quality of life.[16] Post-operative complications were negligible.

In the present study, we found that the procedure, laser pilonidoplasty, is effective in a short period of hospitalization, no painful dressings, low postoperative morbidity, and early resumption to normal daily activity with relatively acceptable risk of recurrence.

Overall maximum patient comfort with 86% of success rate.

Limitations

Larger study is required to establish definitive results.

Patients who have recurrence can offer redo procedure like scooping with laser ablation, and if patient still has persistent disease should be advised flap surgery like limber or bascom flap ECT based on disease.

CONCLUSION

Laser pilonidoplasty is a simple, minimally invasive procedure which can be easily performed under local anesthesia with or without sedation. It is associated with short duration of hospitalization, negligible pain, minimal complications, less morbidity and early resumption to work. The overall patient's satisfaction and success rate of laser pilonidoplasty is good. Considering the recurrence rate, this procedure can be offered as an effective treatment of pilonidal sinus, especially simple cases with acceptable recurrence rate and less morbidity.

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