Original Article

Open Surgical Treatment Versus Laser Therapy of Pilonidal Sinus: A Single Institutional Observational Study

Alaa Abood Najim Al Wadees[1], Waseem A. Elkatib[2], Saad Ab-razaq Mijbas[2], Samer Makki Mohamed Al Hakkak[3], Ali Najeh Al Awwady[3], Maryam S. Al Hakkak[2]

[1]Department of Surgery, Faculty of Medicine, Jabir Ibn Hayyan Medical University, Al-Najaf, Iraq, [2]College of Medicine, University of Kufa, Al-Najaf, Iraq, [3]Department of Surgery, College of Medicine, University of Al-Kafeel, Al-Najaf, Iraq

Abstract

Background: Research findings have been published, demonstrating the efficacy of laser therapy in managing pilonidal sinus (PNS). **Objectives:** To compare the laser and open methods for treating PNS and their effects on patient activity, return to work, disease recurrence, and healing time. We present the conclusive outcomes of this study, which assesses the safety and effectiveness of using a diode laser at 980 nm for treating PNS. **Materials and Methods:** The study included 52 patients suffering from chronic PNS. Laser therapy using a 980 nm diode laser was performed on individuals aged 15 and 58; 26 of them were treated by open method (wide excision), called Group 1, and the remaining 26 were treated by a 980 nm diode laser, called Group 2. **Results:** In Group 1, treated by wide excision, 15.38% were reported to be completely healed, while in Group 2, treated using diode laser 980 nm, 76.9% were reported to be completely healed after laser treatment. **Conclusion:** Laser radiation of diode 980 nm can be safely and effectively used to manage pilonidal disease and avoid the need for conventional sinus excision procedures. This approach reduces the time needed to return to work, lowers the risk of disease recurrence, and shortens the healing time.

Keywords: Diode laser 980 nm, laser therapy, open excision of pilonidal sinus, pilonidal sinus, PNS

Introduction

A medical disease known as pilonidal sinus (PNS) mainly affects the natal cleft, the area overlying the coccyx or tailbone. One or more sinus tracts or midline apertures are the defining features of this disease. These openings typically connect to a fibrous tract within the body.[1] The interior of this tract is lined with granulation tissue, a type of healing tissue that often contains hair. The pilonidal disease can lead to various symptoms and complications, making its management an important aspect of healthcare. It hurts a lot and always becomes infected, resulting in pus seeping and a bad smell. PNS affects about 26 people out of every 100,000 people.[2] Young guys are the group most impacted.[3,4] Excessive body hair, obesity, and a sedentary lifestyle are other risk factors. The pathophysiology of PNS disease development: "Enlarged hair follicles in pilonidal disease occur because of pushing forces and the midline vacuum. When these enlarged follicles become blocked with hair or keratin, they can rupture, which leads to a foreign-body reaction within the subcutaneous tissue above the sacrum. This reaction can result in acute and chronic abscesses, which are pockets of pus and inflammation."[5] Obesity, hairy people, excessive sweating, a sedentary lifestyle, local discomfort, or trauma are often considered causes of the condition. Identifying a distinct sinus bordered by an epithelialized tract is necessary for diagnosing the PNS. A deep abscess cavity with hair as its contents, located in the natal cleft not far from the anus, causes recurrent infections accompanied by chronic pain and discharge. The cavity is moist and full of bacteria.[6] Males with coarse, dark body hair have a higher risk of developing pilonidal disease. It is traditionally associated

Access this article online

Quick Response Code:

Website: https://journals.lww.com/mjby

DOI: 10.4103/MJBL.MJBL_991_24

Address for correspondence: Dr. Samer Makki Mohamed Al Hakkak, Department of Surgery, College of Medicine, University of Al-Kafeel, Al-Najaf 54001, Iraq.
E-mail: s.hakkak@jmu.edu.iq

Submission: 24-Oct-2024 **Accepted:** 07-Jun-2025 **Published:** 23-Jul-2025

How to cite this article: Wadees AANA, Elkatib WA, Mijbas SA, Hakkak SMMA, Awwady ANA, Hakkak MSA. Open surgical treatment versus laser therapy of pilonidal sinus: A single institutional observational study. Med J Babylon 2025;22:S87-94.

with people who spend much time sitting, such as office workers or drivers (formerly known as jeep syndrome). Other risk factors include obesity, poor hygiene, increased sweating, buttock friction, and local trauma. If the sinus is infected, a pilonidal abscess may develop. This presents as a swollen, erythematous area and, on examination, as a fluctuating, painful mass with systemic symptoms of infection.

The use of laser therapy or surgical therapy (wide excision) is employed to treat the PNS.

Surgical therapy (wide excision of the PNS)

In this procedure, the surgeon performs an extensive local excision of the skin around the sinus tract. The resulting hole is left unfilled and given time to mend naturally and close from the bottom up while the wound remains dressed. The disadvantage of this method is that the wound is huge, healing can take up to three months, and daily dressing changes make the procedure tedious.

Laser therapy

In this minimally invasive procedure using a diode laser, a small skin incision is made, the pus is evacuated, and the entire sinus canal is closed with a laser fiber. The advantages of laser therapy are as follows:

The patient is discharged within 24 h and can resume regular work as early as the fifth day.

Compared to a large excision, the wound heals in about 6–8 weeks, so the recovery is much faster.

In response to the rising complications associated with wide excision of PNS, this study proposes using a 980 nm diode laser as an alternative approach. Laser therapy offers numerous advantages for managing PNS, including ease of application, minimal invasiveness, a low recurrence rate, non-toxicity, painlessness, high effectiveness across various conditions, high patient satisfaction, reduced dependence on pharmaceuticals, absence of drug interactions, and rapid return to work and daily routines, coupled with the absence of any documented adverse effects.[6,7] The laser probe removes the epithelium that lines the fistula while also obliterating the tract by vaporization and photocoagulation simultaneously.

Laser technology encompasses various components and types, including chemical, dye, solid-state, gas, semiconductor, metal-vapor, and medical lasers. Medical lasers can be further divided into two categories: contact and non-contact lasers. Contact lasers use a fiber-optic probe with a crystal tip to transmit laser light. This tip absorbs radiant energy and generates heat upon contact with tissues. This heated tip facilitates the conduction of heat energy through the fiber-optic probe to its tip and, subsequently, to the surrounding tissues. This process results in the vaporization of water content in blood and target cells. In the particular process described, a diode laser with a 30 W power output and a 980 nm wavelength was used. Diode lasers represent a direct type of contact laser used in medical applications. The process and device involve a selective photothermal method for accurately heating the surrounding tissue and a surgical target. Initially, the target and the surrounding tissue are gradually heated to approximately 70°C. Subsequently, the target is further heated to 60°C to achieve the desired point of photocoagulation. Ideally, this is accomplished using monochromatic light. Crucially, the temperature differential between the coagulated target and the adjacent tissue is carefully maintained at a mild level to prevent any damage. To the surrounding tissue, even when dealing with relatively large targets like varicose veins.[8] Diode laser devices offer several noteworthy advantages that set them apart from other laser technologies. Their compact size allows for minimal incisions, making them a preferred choice in many medical procedures. Diode lasers also boast a versatile range of beam wavelengths, making them suitable for various medical applications across different fields.[8] One of the key strengths of diode laser devices lies in their fiber-optic probe, which efficiently transmits heat energy in a 360° direction, ensuring a homogeneous energy distribution. This characteristic makes diode lasers particularly adaptable and effective in various locations and clinical settings, consistently delivering positive outcomes.

Materials and Methods

Study design and patients

In an observational study, including 52 patients, between February 2021 and May 2022 at medical centers and hospitals in Al-Najaf City, we studied individuals aged 15–58 years suffering from chronic primary peripheral nervous system issues, whether single or branched. Our approach involved a wide excision method combined with laser therapy using a 980 nm diode laser operating continuously at a power of 10 W, with a power density of 750–850 W/cm². We utilized a radial fiber emitting heat energy in a 360° direction, which caused the sinus tracts to photocoagulate, evaporating blood and tissue fluids at a pace of 0.5 cm per minute. The average duration of the procedure ranged from 10 to 15 min. We followed up with these patients for six months and assessed the results determined by the healing period.

Inclusion and exclusion criteria

Inclusion criteria included individuals with persistent PNS, and patients with primary sacrococcygeal PNS, including single or branched forms of the condition. Exclusion criteria included patients with acute abscess related to PNS and patients with recurrent PNS.

Patients with PNS are located at sites other than the sacrococcygeal area, such as the umbilical region or other

locations. Each patient underwent a comprehensive evaluation, including a thorough medical history review and clinical assessment, encompassing a digital rectal assessment. We also conducted baseline studies for all patients, including a complete blood count, urea, and blood sugar assessments. In cases where necessary, we also performed additional tests such as Electrocardiograms and chest X-rays as part of the evaluation process. Preoperatively, shaving of the back was done; before surgery, informed consent was obtained from each patient in the local tongue, and spinal or general anesthesia was used in every case. All pits and related abscess cavities were located while the patient was prone. An incision was made over the abscess cavity, and debridement was continued until the entire length was debrided. A natal cleft incision was done, and the cavity was irrigated with a solution of hydrogen peroxide and regular saline to establish drainage through the pit. In cases where the PNS exceeded a length of 4 cm, we made a second incision in the middle of the sinus tract. To prevent fluid accumulation during the phase of recuperation. The wound was intentionally left open to facilitate drainage. Patients were scheduled for follow-up appointments at specific intervals, including 1, 4, 12, and 24 weeks after the procedure. The evaluation of the study's outcomes primarily focused on two key factors: the duration of the surgical procedure (operation time) and the time it took for the wounds to heal (healing time).

Laser therapy

Under either spinal or general anesthesia, the patient had the surgery while lying prone on a table. Before the procedure, antibiotic prophylaxis was administered as a preventive measure. The skin in the buttock area was shaved, and an iodine antiseptic solution was applied. Sterile drapes were employed to uncover and create a sterile field covering the entire natal cleft area. The thorough cleaning and debridement of the entire sinus tract, including any pockets and side branches if they existed, carefully cleaned out any unhealthy granulation tissue, hair, and dirt. The midline pits and, if applicable, the lateral pits were cleaned to guarantee the elimination of any blockages and necrotic tissues, as shown in Figure 1.

With the utmost attention to detail, every effort was made to meticulously eliminate all sinus debris to prevent residual hair and unhealthy granulation tissue from remaining after laser therapy. Such remnants could trigger further acute infections, making thorough removal imperative.

This was achieved through a meticulous process that involved.

Curettage

Scrape the tract and any side branches (if any) well to eliminate any undesirable tissue and blockages.

Multiple washes

The sinus was washed more than once using a saline solution (0.9%) and hydrogen peroxide. This multiple-wash approach ensured a thorough cleaning.

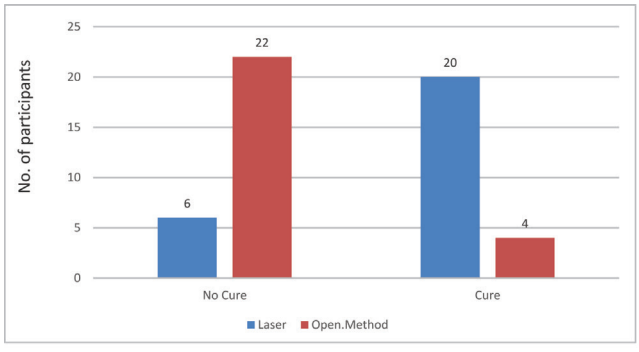

Figure 1: Frequencies of healing based on surgery types

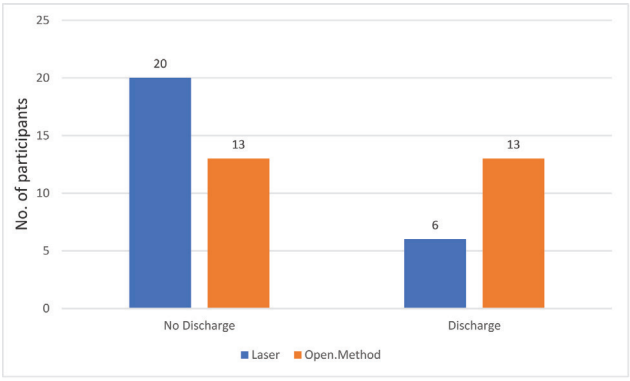

Figure 2: Frequencies of discharge based on surgery types

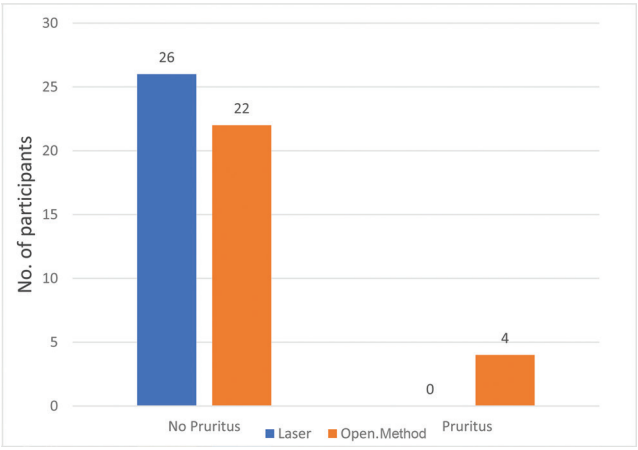

Figure 3: Frequencies of pruritus based on surgery types

Repeated curettage

To remove any remaining hair, debris, necrotic tissue, and unhealthy granulation tissue, curettage was used several times, as shown in Figure 2.

The goal was to leave the surgical site as clean as possible to minimize the risk of post-operative complications. The fiber-optic probe was carefully inserted into the sinus tract until it reached the tip of the tract. Then, a retrograde force was applied at a controlled rate of 0.5 cm per minute while continuously delivering a power of 10 W with a power density of 750–850 W/cm². This procedure was sustained at this rate until the entire fiber was pulled out of the sinus, except for the tip, which remained within the external pits for an additional 10 s before being removed. This marked the completion of the procedure, as illustrated in Figure 3A–E. We used a diode laser with a wavelength of 980 nm to carry out the laser therapy. At the distal end of the optical cable, the optical output was adjusted to either 15 or 30 W. We made use of a radially emitting laser fiber, which radiated light in a 360° circle, ensuring even and consistent photothermal destruction of the tract. After completing the procedure, we applied cold fomentation and dressed the area as part of the post-operative care protocol. The operation's total duration varied, typically within the range of 20–30 min.

Statistical analysis

All participants' questionnaire responses were carefully documented in a datasheet, and each one was given a distinct serial identification number. To minimize errors during data entry, a multiple-entry system was employed. For data analysis, we utilized version 28.0 of the Statistical Package for the Social Sciences (SPSS) program, which was created in Chicago, Illinois, USA, by IBM. Furthermore, the Real Statistics Resource Pack for Mac, version 7.2, was utilized from the Excel 2016 resource pack. This resource pack is copyrighted from 2013 to 2020 and can be accessed at www.real-statistics.com. These software tools facilitated the comprehensive analysis of the collected data for the study. Descriptive data analysis was conducted to summarize the information on each group's participants. For categorical variables, the values were expressed as *n* (%) to show each category's count and percentage distribution within the dataset. The data distribution was also assessed to determine whether it followed a normal distribution or exhibited significant deviations from normality. Understanding the properties of the data and choosing the best statistical techniques for additional analysis depends on this stage. The following statistical tests were used in the inferential data analysis process:

The student *t*-test for the two separate samples is as follows: This test evaluated the disparities in means among several groups. It assists in determining whether statistically significant differences exist between the means of numerical data when comparing two independent groups. To determine statistical significance, a *P* value of less than 0.05 was employed, which indicates that observed differences were unlikely to be the result of chance.

Chi-square test: This method assessed how closely category variables were related to one another. It assesses whether two or more categorical variables have a meaningful relationship or dependencies on one another. To find statistically significant connections or a meaningful relationship between the categorical variables under investigation, a significance level of $P < 0.05$ was employed.

Fisher's exact test: Fisher's exact test was utilized as an alternative when the chi-square test was not applicable, typically in small sample sizes or when specific assumptions of the chi-square test could not be met. This test is particularly useful for small datasets. Similar to the chi-square test, a significance level of $P \leq 0.05$ was used to detect statistically significant associations between categorical variables.

To conclude, the data were analyzed using statistical tests with a significance level of $P < 0.05$ to establish if detected relationships or differences were likely the result of chance or statistically significant.

Ethical approval

The study obtained ethics approval from the Ethical Committee of the Faculty of Medicine, Jabir Ibn Hayyan Medical and Pharmaceutical University (No. 335 JMU-January 6, 2021).

Results

The demographic and clinical attributes of the patient groups were condensed or presented in summary form, as shown in Table 1. The table provides an overview of various key aspects.

Mean age: The participants' ages ranged from 15 to 58 years old on average. Sex distribution: Among the patients in the study groups, 80.8% were male, and 19.2% were female.

These findings show the age range and gender distribution within the patient groups under investigation, as shown in Table 1.

The frequencies of the age range are shown in Figure 4; participants' ages were divided into subgroups. Results indicated that the age range 15–25 years was the most age group who were infected with PNS, followed by the age range (25–36).

However, when the study samples' sex distribution was looked at, the results showed that there were roughly four times as many men as women who underwent open

Table 1: Descriptive of the demographic and the study population ($N = 52$)

Variables		Frequency	Percentage (%)
Age group	15–25 years	23	44.2
	25–36 years	17	32.7
	37–47 years	6	11.5
	48–58 years	6	11.5
Sex	Male	42	80.8
	Female	10	19.2
Healing	No healing	28	53.8
	Healing	24	46.2
Type of Surgery	Diode laser 890 nm	26	50.0
	Open surgery of PNS	26	50.0

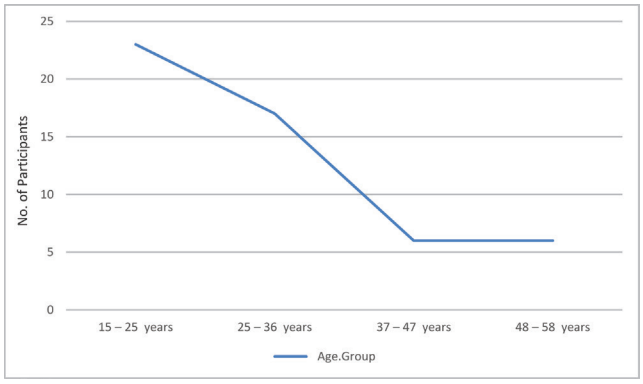

Figure 4: Estimation plot of determination of mean age of the study groups

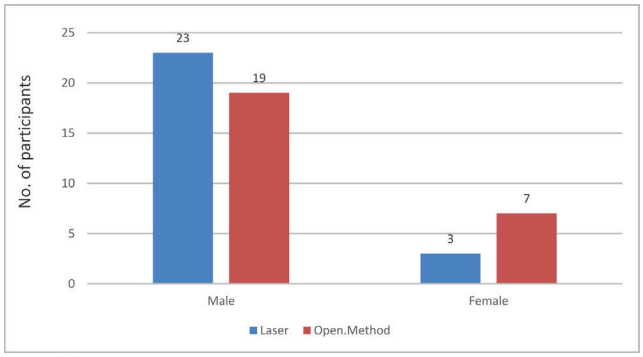

Figure 5: Frequencies of sex based on surgery types

surgery or used a diode laser 980 nm to treat PNS. This information is shown in Figure 5.

In Figure 1, patients treated with diode laser 980 nm showed a high healing rate compared to patients who used open surgery. Out of 24 completely healing participants after treatment, 20 were treated by diode laser 980 nm [Figure 6].

In Table 2, when comparing the number of patients treated with a diode laser at 980 nm to those who underwent open surgery during the healing process, a significant difference was seen between the treatment groups ($P < 0.001$). It was reported that 76.9% of patients fully recovered following laser treatment.

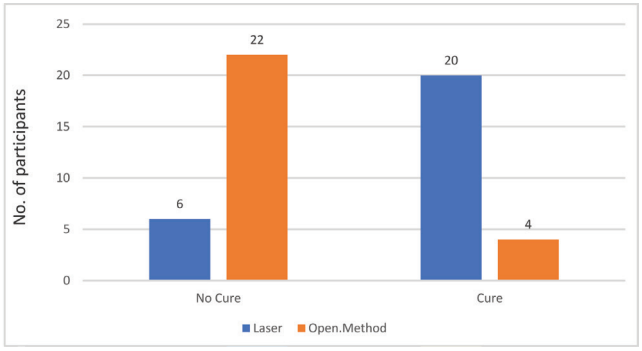

Figure 6: Frequencies of cure based on surgery types

Difference between demographic characteristics in patients who have used diode laser 980 nm in the treatment of pilonidal sinus compared to patients who have used open surgery for treatment of peripheral nervous system (PNS) [Table 3].

The results are reported with "*n*" indicating the number of subjects and the corresponding percentage. A significance level of $P < 0.05$ is used to determine statistical significance, where "(S)" denotes significant results, and "(NS)" represents non-significant findings.

Discussion

A chronic inflammatory process that mostly starts inside the hair follicles in the natal cleft—the crease between the buttocks—is the hallmark of pilonidal illness. The conventional method for diagnosing PNS is to locate a unique sinus tract that is coated with epithelial tissue, located in the natal cleft not far from the anus, and has hair as one of its main constituents. This condition often presents with deep abscess cavities and thrives in a moist environment conducive to bacterial growth. This area's hair, debris, and friction contribute to recurrent infections, resulting in pain and discharge. The optimal therapy for pilonidal disease should address the root cause. It offers a swift and effective cure that enables patients to return to their regular activities while minimizing the potential for complications and morbidity. Recent advancements in laser hair removal

Table 2: Disparities in patient demographics between those treated with open surgery for PNS and those treated with a diode laser 980 nm for pilonidal sinus therapy

Group		Number of patients ($N = 52$)		
		Diode laser 890 nm, $N = 26$	Open surgery of PNS, $N = 26$	*P* value
Gender	Male	23 (88.46%)	19 (73.08%)	0.15 (NS)
	Female	3 (11.54%)	7 (26.92%)	
Pain	No pain	12 (88.46%)	6 (23.08%)	0.08 (NS)
	Pain	14 (46.15%)	20 (76.92%)	
Discharge	No discharge	20 (76.92%)	13 (50%)	0.044 (S)
	Discharge	6 (23.08%)	13 (50%)	
Pruritus	No pruritis	26 (100%)	22 (84.62%)	0.037 (S)
	Pruritis	0 (0%)	4 (15.38%)	
Cure	No cure	6 (23.08%)	22 (84.62%)	<0.001 (S)
	Cure	20 (76.92%)	4 (15.38%)	

The percentage (%) and *n*: number of respondents are used to present the results, with $P < 0.05$ indicating a significant difference. Significant (S) and non-significant (NS)

Table 3: Disparities in the demographic characteristics of individuals treated with a diode laser at 980 nm for pilonidal sinus versus those treated with open surgery for PNS

Variables	Group	Number of patients ($N = 52$)		
		Diode laser 890 nm, $N = 26$	Open surgery of PNS, $N = 26$	*P* value
Sex	Male	23 (88.46%)	19 (73.08%)	0.15 (NS)
	Female	3 (11.54%)	7 (26.92%)	
Healing	No healing	6 (23.08%)	22 (84.62%)	<0.001 (S)
	Healing	20 (76.92%)	4 (15.38%)	
Recurrence rate		3 (11.54%)	10 (38.46%)	0.157

The percentage (%) and *n*: number of respondents are used to present the results, with $P < 0.05$ indicating a significant difference. Significant (S) and non-significant (NS)

technology have shown promise, with certain studies indicating that hair removal can help reduce the likelihood of recurrence. The laser sinus coagulation technique aims to minimize damage to the surrounding healthy tissue while specifically targeting and removing the sinus and granulation tissue. For the therapy procedure in our investigation, we used a diode laser with a wavelength of 980 nm. When this diode laser is utilized in a defocused continuous mode at a power level of 10 W, it generates sufficient heat to elevate the temperature of the affected tissue above 50°C but below 100°C. This controlled temperature range is critical because it induces protein denaturation. The denaturation of proteins within the affected area destroys the diseased epithelium and its surface antigens. Furthermore, the diode laser's ability to penetrate deeper into tissues also denatures various immune response components, including antigen-antibody complexes, cytotoxic proteins, and sub-epithelial lymphocytes. The long-term bactericidal impact of the diode laser, which showed superior performance in this regard, is a noteworthy finding of this study. This suggests that the treatment targets the immediate issues and has a lasting impact on bacterial control and infection prevention. All patients who underwent laser coagulation therapy were discharged from the hospital within a few hours after the procedure and could move normally, such as sitting and walking [Figure 7].

We found that participants in our study ranged widely in age from 15 to 58 years old, with a sizable percentage of them being in the 15–25 age range, constituting 44.2% of the total sample, as indicated in Table 1. Regarding gender distribution, our study included 42 male participants, 80.8% of the total, and 10 female participants, accounting for 19.2%, as shown in Table 3. These gender proportions are somewhat similar to those reported in previous studies. For instance, Georgiou[7] reported 83% male and 17% female participants, while Pappas *et al*.[8] reported 77.2% male and 22.8% female participants.

In our latest investigation, the operating technique lasted between 10 and 15 min, with an average operative time of 12.5 min. This period is marginally longer than the outcomes[9] that Dessily *et al*. reported, where the operating time was roughly 9 min. However, it aligns with Pappas *et al*.[8] findings, who also reported an operative time ranging from 20 to 30 min. It is worth noting that our operative time was shorter than the Georgiou study,[9] where the operative time was around 40 min. These comparisons provide context for our study's demographic characteristics and operative time, highlighting similarities and differences with previous research findings. The healing period in our study was found to be between 30 and 60 days, with a mean healing time of 17.6 ± 12.4 days. The mean healing

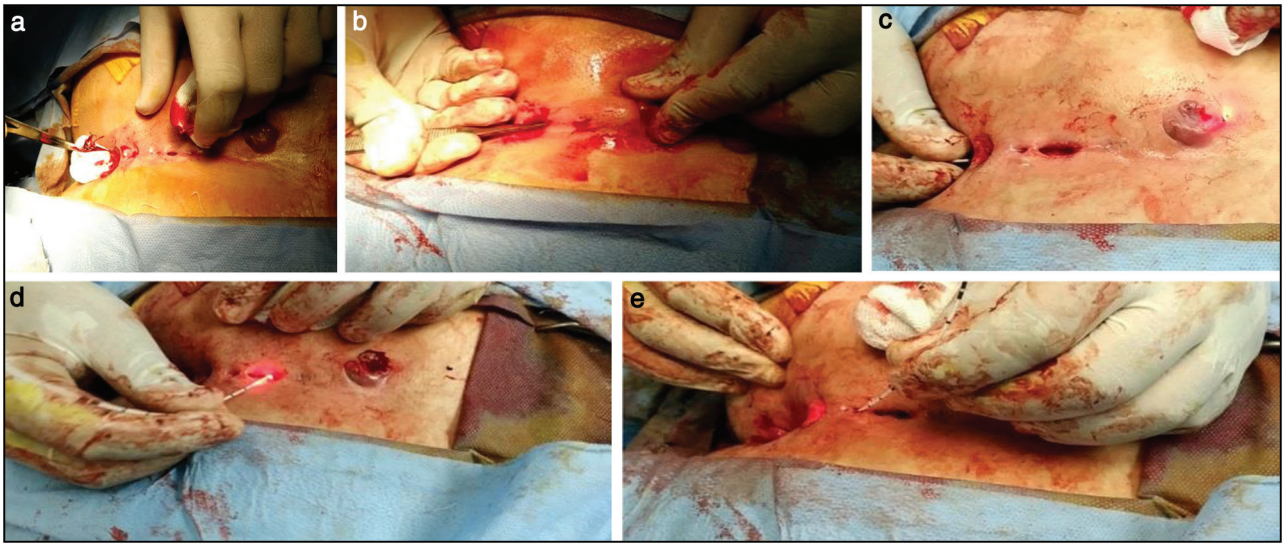

Figure 7: (a) Clearing the sinuses of debris, hair, and necrotic material; (b) cleaning the sinuses to get rid of any harmful granulation tissue; (c) destruction of the sinus opening using laser pilonidoplasty; (d) laser pilonidoplasty: a sinus wall-destroying procedure; and (e) pilonidoplasty using laser (sinus tract destruction)

Table 4: Disparity between the research groups demographics and recuperation

Variables	Time of recovery month of patients ($N = 52$)		
	Group	Mean ± SD	*P* value
Gender	Male	1.83 ± 0.91	0.405 (NS)
	Female	2.10 ± 0.88	
Pain	No pain	1.50 ± 0.71	0.023 (S)
	Pain	2.09 ± 0.93	
Discharge	No discharge	1.73 ± 0.84	0.097 (NS)
	Discharge	2.16 ± 0.96	
Purities	No purities	1.81 ± 0.89	0.022 (S)
	Purities	2.75 ± 0.50	
Cure	No cure	2.32 ± 0.819	<0.001 (S)
	Cure	1.38 ± 0.711	
Type of surgery	Laser	1.19 ± 0.40	<0.001 (S)
	Open method	2.58 ± 0.70	

The operation took a total of 20–30 min

period of 19.5 ± 14.4 days was reported by Dessily *et al*.[9] is slightly different from this meantime. However, Georgiou[7] stated that the typical healing duration was about 35 days. The results, however, contrast significantly with the study by Pappas *et al*.[8] where the average healing period was approximately 60 days and the range of healing times was 45 to 65 days. Remarkably, the average time needed to resume regular activities was 7–10 days, which was constant across all investigations. In this investigation, as shown in Table 4. In the end, all instances healed, and in more complex situations, this was accomplished through cleaning and the use of oral antibiotics. In this study, the overall healing rate was 76.92%. This healing rate is comparable to the findings of Georgiou,[7] who reported a healing rate of 92%, and the results of Dessily *et al*.,[9] where a healing rate of 94% was noted. These equal recovery rates imply that the oral antibiotics and cleaning utilized in this study's treatment method are as effective as those used in the cited trials. Reports on the benefits of laser epilation for PNS disease are included in this study's findings. Benedetto and Lewis[10] report that two patients with persistent PNS illness experienced long-lasting relief following treatment with an 800 nm diode laser. Lavelle *et al*.,[10,11] in one example of pilonidal illness, treated the surgical scar site five times with a ruby laser for epilation; after six months, there was no recurrence. Of the 23 patients who underwent laser epilation following surgery and were closely watched, 19 did not have recurrences or need additional surgery, according to research by Schulze and colleagues.[12] It is crucial to remember that these conclusions are based on a small number of patients and a brief follow-up period. As such, it can be difficult to draw firm conclusions from

these investigations. Nevertheless, our study's results align even with minimal laser treatments, given the body of research demonstrating the advantages of laser epilation as a primary or adjunctive strategy to open surgery. It is noteworthy to emphasize that the data obtained from our study and from retrospective studies on recurrence rates following laser epilation after PNS surgery are very different from those published by Demircan *et al*.[13] Recurrence rates were found to be 4% in the surgery-only group and 20% in the laser epilation group in their prospective randomized research. It is imperative to recognize, nonetheless, that the primary focus of our study during the follow-up period was short-term results. Additional information regarding the efficacy of these treatments may be obtained through long-term assessment. A number of considerations, such as the diode laser's accessibility, mobility, and compatibility with the optical fiber being used, went into choosing it for this specific technique. The quantity of laser energy delivered to the tissue in this manner was directly correlated with the fistula tract's length, given that a set power level and retrograde application rate were applied. In essence, the more laser energy deposited at the treatment location, the longer the fistula tract and the longer the exposure period. When selecting the right diode laser, this link between tract length and energy deposition was crucial. It took an extra 10 s of laser irradiation at the external orifice to successfully thicken the projecting granulation tissue. This stage promoted the closure of the external orifice and aided in the healing process. Crucially, it was found that, in the selected circumstances, the well-formed fistula tract could be safely coagulated without appearing to injure the surrounding tissue. There were no recorded laser safety events or problems during the process, suggesting that the laser was applied safely and under control.[14,15]

Conclusion

Diode laser radiation at 980 nm has demonstrated safety and effectiveness in managing pilonidal disease. It offers an alternative approach that eliminates the need for conventional sinus excision procedures. This innovative technique reduces the downtime needed to return to work, lowers the risk of disease recurrence, and shortens the healing period. It presents a promising advancement in treating pilonidal disease, providing patients with improved outcomes and a quicker recovery.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Akin M, Gokbayir H, Kilic K, Topgul K, Ozdemir E, Ferahkose Z, *et al*. Rhomboid excision and Limberg flap for managing pilonidal sinus: Long-term results in 411 patients. Colorectal Dis 2008;10:945-8.
2. Søndenaa K, Andersen E, Nesvik I, Søreide JA. Patient characteristics and symptoms in chronic pilonidal sinus disease. Int J Colorectal Dis 1995;10:39-42.
3. Alferink M, Atmowihardjo L, Smeenk R, Cadanova D, Schouten R. Pilonidal disease laser therapy: Short-term results of an observational cohort study. World J Surg Surgical Res 2019;2:1143.
4. Enriquez-Navascues JM, Emparanza JI, Alkorta M, Placer C. Meta-analysis of randomized controlled trials comparing different techniques with primary closure for chronic pilonidal sinus. Tech Coloproctol 2014;18:863-72.
5. Aldean I, Shankar PJ, Mathew J, Safarani N, Haboubi NY. Simple excision and primary closure of pilonidal sinus: A simple modification of conventional technique with excellent results. Colorectal Dis 2005;7:81-5.
6. Bascom J. Surgical treatment of pilonidal disease. BMJ 2008;336:842-3.
7. Georgiou GK. Outpatient laser treatment of primary pilonidal disease: The PiLaT technique. Tech Coloproctol 2018;22:773-8.
8. Pappas AF, Christodoulou DK. A new minimally invasive treatment of pilonidal sinus disease using a diode laser: A prospective large series of patients. Colorectal Dis 2018;20:207-14.
9. Dessily M, Charara F, Ralea S, Allé JL. Pilonidal sinus destruction with a radial laser probe: Technique and first Belgian experience. Acta Chir Belg 2017;117:164-8.
10. Benedetto AV, Lewis AT. Pilonidal sinus disease treated by depilation using an 800 nm diode laser and review of the literature. Dermatol Surg 2005;31:587-91.
11. Lavelle M, Jafri Z, Town G. Recurrent pilonidal sinus treated with epilation using a ruby laser. J Cosmet Laser Ther 2002;4:45-7.
12. Schulze SM, Patel N, Hertzog D, Fares LG 2nd. Treatment of pilonidal disease with laser epilation. Am Surg 2006;72:534-7.
13. Demircan F, Akbulut S, Yavuz R, Agtas H, Karabulut K, Yagmur Y, *et al*. The effect of laser epilation on recurrence and satisfaction in patients with sacrococcygeal pilonidal disease: A prospective randomized controlled trial. Int J Clin Exp Med 2015;8:2929-33.
14. Mohammed HA, Sahi NM, Ahmed RT, Al-Rubaye A. Antimicrobial activity of some nanoparticles synthesized by laser ablation technique against some bacteria isolated from oral cavity. Med J Babylon 2022;19:601-8.
15. Aboob AJ, Alyassiri AM, Alkhafaji Y. Detection of viruses associated with herpes labialis patients in babylon province pre and post treatment with low power laser therapy (diode laser). Med J Babylon 2024;21:444-50.