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Efficacy and Outcomes of Laser Treatment in Pilonidal Sinus Disease

Pilonidal Sinüs Hastalığında Lazer Tedavisinin Etkinliği ve Sonuçları

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ABSTRACT

AIM: In recent years, minimally invasive treatment methods have introduced significant innovations in the surgical management of pilonidal sinüs disease. This study aims to comprehensively evaluate the efficacy of laser treatment for pilonidal sinus disease, focusing on treatment success, recurrence rates, complications, and patients' return to normal life.

MATERIAL AND METHOD: In this study, data from patients treated with laser ablation for pilonidal sinus disease between August 2020 and August 2023 were retrospectively analyzed. Patients aged 18-40 who were treated with laser for pilonidal sinus disease were included in the study. Patients with recurrence, those who had undergone chemotherapy/radiotherapy in the anorectal or sacrococcygeal region, those with concurrent malignancies, those with a history of inflammatory bowel disease, those on chronic steroids, diabetics, and patients with autoimmune diseases were excluded from the study.

RESULTS: A total of 49 patients (5 females, 44 males) who underwent laser ablation for pilonidal sinus disease were included in the study. It was found that 16 (32.7%) of the included patients had a history of abscess drainage due to pilonidal sinus disease. In the postoperative period, the median (min-max) wound healing time was 28 (20-52) days. A total of 4 patients (8.3%) experienced recurrence.

CONCLUSION: Considering pilonidal sinus disease as a subcutaneous infectious condition, laser ablation should be regarded as one of the primary treatment options for pilonidal sinus surgery, given its acceptable recurrence rates, low complication risk, rapid return to normal activities, and cosmetic advantages.

Keywords: laser, pilonidal sinus disease, minimally invasive

ÖZET

AMAÇ: Son yıllarda, minimal invaziv tedavi yöntemleri pilonidal sinüs hastalığının cerrahi yönetiminde önemli yenilikler getirmiştir. Bu çalışmanın amacı, pilonidal sinüs hastalığında lazer tedavisinin etkinliğini, tedavi başarısı, nüks oranları, komplikasyonlar ve hastaların normal yaşantıya dönüş süresi açısından kapsamlı bir şekilde değerlendirmektir.

GEREÇ VE YÖNTEM: Bu çalışmada, Ağustos 2020 ile Ağustos 2023 arasında pilonidal sinüs hastalığı nedeniyle lazer ablasyon yöntemiyle tedavi edilen hastaların verileri retrospektif olarak incelendi. 18-40 yaş arası pilonidal sinüs hastalığı nedeniyle lazer ile tedavi edilen hastalar çalışmaya dahil edildi. Nüks yaşayan hastalar, anorektal veya sakrokoksigeal bölgede kemoterapi/radyoterapi uygulanan hastalar, eş zamanlı malignitesi olan hastalar, inflamatuar barsak hastalığı öyküsü bulunan hastalar, kronik steroid kullanan hastalar, diabeti olan hastalar ve otoimmün hastalığı bulunan hastalar çalışma dışı bırakıldı.

BULGULAR: Toplamda 49 hasta (5 kadın, 44 erkek) pilonidal sinüs hastalığı nedeniyle lazer ablasyon tedavisi uygulandı. Dahil edilen hastalardan 16'sında (%32.7) daha önce abse drenajı öyküsü olduğu belirlendi. Postoperatif dönemde, median (min-maks) yara iyileşme süresi 28 (20-52) gün olarak görüldü. Toplamda 4 hastada (%8.3) nüks gözlemlendi.

SONUÇ: Pilonidal sinüs hastalığını subkutanöz enfeksiyöz bir durum olarak değerlendirildiğinde, lazer ablasyon, kabul edilebilir nüks oranları, düşük komplikasyon riski, hızlı normal yaşantıya dönüş ve kozmetik avantajları nedeniyle pilonidal sinüs cerrahisi için ilk tercih edilecek tedavi yöntemlerinden biri olarak kabul edilebilir.

Anahtar kelimeler: Lazer, pilonidal sinüs hastalığı, minimal invaziv

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INTRODUCTION

Pilonidal Sinus Disease (PSD) is an infectious condition frequently observed in the sacrococcygeal region and is more common among young males. Although its etiology is not fully elucidated, PSD is generally considered to be an acquired disease. Risk factors include genetic, obesity, prolonged sitting, poor hygiene, and excessive body hair.[1,2]

Several methods for the treatment of PSD have been developed and applied. However, no gold standard treatment method has yet been established [3,4]. Conventional surgical techniques involve the complete removal of the infected skin and subcutaneous tissues, followed by secondary healing, primary repair, or flap techniques. Nonetheless, these methods often lead to problems such as large wounds, prolonged healing times, and poor cosmetic outcomes.[4,5]

In recent years, minimally invasive treatment methods have introduced significant innovations in the surgical management of PSD. These methods are generally considered less invasive and offer a more comfortable recovery process for patients. Postoperative pain is usually minimal, and the risk of complications is low. Additionally, patients can return to their normal activities more quickly. High success rates and low recurrence rates enhance the appeal of these treatment methods. Laser therapy, for example, represents one of these minimally invasive approaches and is considered an important alternative in the treatment of the pilonidal sinus disease.[6-8]

This study aims to comprehensively evaluate the efficacy of laser treatment for pilonidal sinus disease, focusing on treatment success, recurrence rates, complications, and patients' return to normal life.

MATERIAL AND METHOD

In this study, data from patients treated with laser ablation for pilonidal sinus disease between August 2020 and August 2023 were retrospectively analyzed. The data were obtained from prospectively standardized clinical notes. Demographic information of the patients was recorded. Data from preoperative and perioperative periods (operation day, postoperative day 1, 1st week, 1st month,3th month, and 1st year) were used based on examination notes. Complete healing was defined as the full closure of the sinus cavity epithelium. Patients who did not begin epithelialization within 1 month were considered persistent. Recurrence was defined as the appearance of an asymptomatic pit or the development of an abscess/infection in the natal cleft during the 1-year postoperative follow-up of patients who had completely healed after treatment. All patients were discharged at the 4th postoperative hour. Postoperative care included a 5-day course of antibiotic therapy (Amoxicillin-clavulanic acid 2x1000mg).

Patients aged 18-40 who were treated with laser for pilonidal sinus disease were included in the study. Patients with recurrence, those who had undergone chemotherapy/radiotherapy in the anorectal or sacrococcygeal region, those with concurrent malignancies, those with a history of inflammatory bowel disease, those on chronic steroids, diabetics, and patients with autoimmune diseases were excluded from the study.

Surgical Procedure

All patients were positioned prone and underwent the procedure under sedation combined with local anesthesia (bupivacaine). Intravenous prophylaxis with 1 gram of Cefazolin was administered. Hair and debris from the pit openings and sinus cavities were cleaned and curettaged. Subsequently, a NeoV V1470 Diode Laser (neoLaser Ltd, Caesarea, Israel) with a 2 mm probe was used to perform ablation along each sinus tract with 10 W power, 5-second pulse duration, and 5 pulses (total 250 J). After ablation, a 1-minute cold application with sterile ice was applied to the pit opening. No sutures were used

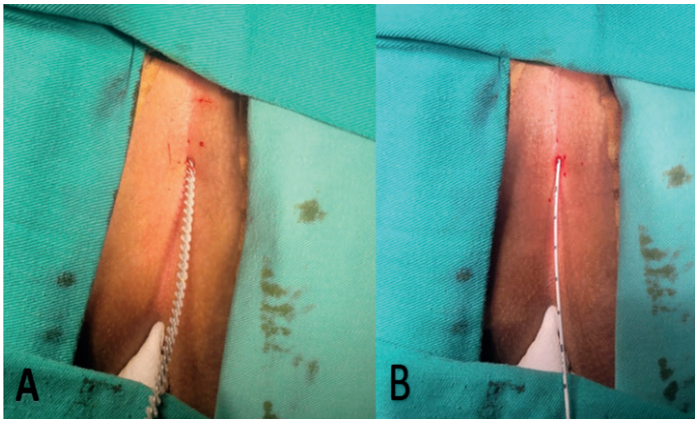

Figure 1. Curettage (A) and the application of laser ablation (B) in pilonidal sinus disease

illustrates curettage and the application of laser ablation in pilonidal sinus disease.

Statistical Analysis

Analyses were carried out with SPSS v26 (IBM-SPSS, Chicago, IL, USA). The distribution is checked by looking at Skewness and Kurtosis. Normally distributed data are presented as the mean ± standard deviation (SD). Non-normally distributed data are presented as the median (minimum-maximum). The categorical variables were expressed as number of patients and percentage of patients. A p value of less than 0.05 was considered to be statistically significant.

Ethics committee approval number '48' dated 22.12.2023 was received from Atılım University Medicana Hospital for this study.

RESULTS

A total of 49 patients (5 females, 44 males) who underwent laser ablation for pilonidal sinus disease were included in the study according to the criteria. The demographic data and preoperative characteristics of the patients are presented in

Table 1. Demographic and Preoperative Characteristics of the Patients

Characteristics	Value
Age, years (mean±SD)	26±3.7
Female/Male	5/44
Body Mass Index (BMI, kg/m^2, mean±SD)	27.5±1.9
Previous Abscess Drainage, n (%)	16 (32.7)
Number of Pits (mean±SD)	1.8±1.2

It was found that 16 (32.7%) of the included patients had a history of abscess drainage due to PSD. The average number of pits among patients based on preoperative evaluation was 1.8.

In the postoperative period, the median (min-max) wound healing time was 28 (20-52) days. Postoperative infections were identified in two male patients. In these patients, the infections were managed with daily local wound care using rifampicin 125 mg/2 ml for one week and no abscesses developed. One of these patients was a 33-year-old male with a Body Mass Index (BMI) of 29.9 and 5 midline pits. Persistent disease developed in this patient, and laser ablation was repeated after 1 month. Following the repeat laser ablation, the patient achieved complete healing in 22 days, and no recurrence was observed in postoperative follow-ups. The other patient with an infection was a 28-year-old male with a BMI of 29.8 and 4 midline pits. This patient achieved complete healing in 38 days without the need for additional procedures. Both patients with infections had a history of pilonidal abscess. Apart from these two patients with infections, no complications were observed in the remaining patients.

A total of 4 patients (8.3%) experienced recurrence. All patients with recurrence were male, and 3 of these patients had a history of pi-

lonidal abscess. None of the patients with recurrence experienced additional complications in the postoperative period. Postoperative outcomes of the patients are summarized in

Table 2. Postoperative outcomes of patients

Variable	Value
Wound Healing Time, median (range)	28 (20-52)
Complication, n (%)	2 (4.1)
Recurrence, n(%)	4 (8.3)
Persistent, n(%)	1 (2)
Postoperative Day 1 VAS (mean±SD)	1.3±1.4
Postoperative Day 7 VAS, median (range)	0 (0-4)
Return to Daily Activitiy (days), median (range)	2 (1-8)

DISCUSSION

Although conventional pilonidal sinus surgeries generally yield successful results, these methods often require extensive excision of all diseased skin and subcutaneous tissues, leading to large wound areas. This can result in delayed healing, increased risk of infection, and delays in return to normal activities. Emile et al.[9] reported complication rates of 26.9% for Karydakis flap (KF) and 19.3% for Limberg flap (LF) in a meta-analysis involving 1943 patients. In contrast, the study by Li et al.[5] found no complications following laser ablation. Şahin et al.[8] observed a wound infection rate of 8.3% after laser ablation. In this study, the complication rate following laser ablation was 4.1%, with only local infections that were controlled with wound care. Laser ablation appears to offer advantages over conventional surgical methods in terms of complications, as it is a minimally invasive procedure. Complications commonly encountered after flap techniques, such as wound infections, wound dehiscence, hematoma, seroma, and flap edema, are not expected following laser ablation.

The median wound healing time in this study was calculated to be 28 (20-52) days. Although this duration may seem prolonged, the absence of sutures in laser ablation means that patients do not require the movement restrictions recommended from the first postoperative days as seen in flap surgeries. Additionally, the low postoperative VAS scores positively influence the patients' early return to normal activities.

Recurrence rates following laser treatment have been reported as 2.1% by Li et al.[5], 15% by Taşkin et al.[10], and 14.9% by Dessily et al.[11] This study observed a recurrence rate of 8.3%, which aligns with the literature. Recurrence rates for conventional surgical techniques have been reported to be between 3.7-4.4%.[9] In cases where recurrence occurs after laser ablation, success rates for repeat laser ablation procedures have been found to be between 75-78.3%. [5,11,12] Thus, it is believed that repeat laser ablation can be beneficial if recurrence occurs. While recurrence rates may appear lower with conventional flap surgeries, literature indicates that minimally invasive surgical techniques are more successful in terms of postoperative complications, pain, and return to daily activities.[9,13,14]

A major limitation of this study is the limited number of patients and the lack of comparison with other surgical methods.

CONCLUSION

Considering pilonidal sinus disease as a subcutaneous infectious condition, laser ablation should be regarded as one of the primary treatment options for pilonidal sinus surgery, given its acceptable recurrence rates, low complication risk, rapid return to normal activities, and cosmetic advantages.

Author contributions

Conceptualization, M.G. and A.C.E.; methodology, M.G.; formal analysis, M.G.; investigation, A.C.E.; resources, A.C.E. and M.G.; data curation, M.G.; writing-Original draft preparation, M.G.; writing-Review and editing, M.G. and A.C.E. All authors have read and agreed to the published version of the manuscript. M.G. is the guarantor of the paper.

Informed consent was obtained from all individual participants included in the study.

The data presented in this study are available on request from the corresponding author. The data are not publicly available due to institutional policy.

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Authors have no conflict of interest to declare.

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