

Original Article

The effect of laser epilation on recurrence and satisfaction in patients with sacrococcygeal pilonidal disease: a prospective randomized controlled trial

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Abstract: Background: The primary aim of this prospective study was to investigate the effects of laser epilation on patient satisfaction and recurrence in patients who underwent pilonidal sinus surgery. Method: Sixty patients scheduled for pilonidal sinus surgery in our clinic between 2011 and 2012 were enrolled in this prospective randomized controlled study. Patients were divided in two groups of 30 patients each. Only the Karydakias flap reconstruction technique was performed in the first group. Two sessions of laser epilation were applied in the second group in addition to Karydakias flap reconstruction. The patients in the second group underwent laser epilation 2 weeks before and 3 weeks after the surgery for a total of 2 times in a private office. Results: There were no statistically significant differences between the groups in terms of age, gender, smoking usage, ASA Score, duration of patient's complaints, BMI and hospital stay. There were no statistically significant differences between the groups in terms of surgical site infection, wound separation, abscess formation at the any time postoperatively. There were statistically significant differences between the two groups in the first week post operation considering the VAS pain score ($P<0.03$) and VAS satisfaction score ($P<0.01$). While there were statistically significant differences between the two groups in the first month post operation considering the VAS pain score ($P<0.0001$), there were no statistically significant differences between the groups in terms of VAS satisfaction score in the first and three month postoperatively. In the telephone interviews done 1 year after the surgery, recurrence were detected in 4% of first group and in 20% of second group. Recurrence rates were significantly higher in the second group ($P=0.045$). Conclusion: Our results show that laser epilation does not reduce the relapse rates in pilonidal sinus surgery, as expected. It is obvious that prospective randomized studies need to be held on this subject.

Keywords: Pilonidal disease, laser epilation, recurrence, patient's satisfaction

Introduction

Pilonidal sinus is a disease that commonly occurs in the intergluteal sulcus, presenting with abscesses or sinuses containing hair. It is mostly seen in men and people with dense hair. Many conservative and surgical methods have been described in the literature. Asymptomatic patients do not require treatment [1]. Aspiration and antibiotherapy, drainage, and curettage of the abscess region with drainage are the treatment options for acute abscesses [1, 2]. Many different techniques have been defined for chronic and recurrent pilonidal sinus disease. Wide resection + laying open decreases the relapses but also requires a longer recovery period, causing task force loss [3, 4]. Wide exci-

sion + primary closure consists of symmetrical or asymmetrical incision by applying the incision vertically, horizontally, or obliquely. Wound healing is faster in this method than laying open. The major disadvantages of this technique are postoperative wound separation and high rates of relapses [5]. The most popular flap techniques are the Karydakias method and rhomboid excision + limberg flap methods. Using flap techniques reduces postoperative relapse incidences to almost 1% in spite of variable rates reported in some series [6, 7].

The most important etiological factor in pilonidal sinus disease is predicted to be the amount of body hair [8, 9]. Various epilation techniques have been used in treatment and to reduce the

Table 1. The demographic characteristics of the patients with or without laser epilation

Patient's Characteristics	Group I (n=30)	Group II (n=30)	P
Age (years)	23±1	23±0	0.9
Gender			
Male	22	23	0.9
Female	8	7	
BMI (kg/m ²)	25±3	25±7	0.9
Smoking Usage			
Yes	18	15	0.5
No	12	15	
Duration of Complaints (mo)	18±4	20±5	0.4
ASA Score			
ASA I	27	26	0.7
ASA II	3	4	
Length of hospital stay (days)	2.2±0.1	2.2±0.6	0.9

relapse rates of the disease. The most popular epilation techniques are shaving with conventional or electrical razors, along with different laser epilation methods. Although laser epilation is reported to reduce the postoperative relapse rates in case reports and in retrospective studies, especially in the last decade, it is hard to make an objective comment based on evidence, since there have not been enough prospective randomized studies held to date. In this prospective randomized study, we investigated the effects of laser epilation on patient satisfaction and relapse rates postoperatively.

Materials and methods

Sixty patients scheduled for pilonidal sinus surgery in Department of Surgery, Diyarbakir Education and Research Hospital between 2011 and 2012 were enrolled in the study. Patients were divided in two groups of 30 patients each. Only the Karydakias flap reconstruction technique was performed in the first group (Group 1). Two sessions of laser epilation were applied in the second group in addition to Karydakias flap reconstruction (Group 2). Simple randomization was performed in patient selection. Written consent was obtained from all of the patients. The patients in the second group underwent laser epilation 2 weeks before and 3 weeks after the surgery for a total of 2 times in a private office. Laser Epilation procedures were carried out using an Alexandrite laser (GentleLase, Candela, Wayland, MA). The laser

has a wavelength of 755 nm and was used at 14-20 J/cm² fluence, 18 mm spot size, and 3 ms pulse duration. The epilation procedure was applied to the intergluteal sulcus, including the area where the surgery was to be performed.

Complete blood counts (CBC), liver function test, renal function test were analyzed and American Society of Anaesthesiologists (ASA) risks were defined in all the patients before the surgery. Age, gender, BMI, smoking habits and duration of patient's complaints were documented. Patients were required to bathe the preceding night before the surgery. All patients underwent spinal anesthesia in a prone position.

The surgical sites were shaved with an electrical shaver and cleaned with 10% povidon iodine solution. Prophylactic antibiotherapy was done with 1 g of sefazoline sodium. Karydakias flap reconstruction was chosen as the surgical technique. Hemovac drainage was placed in all the patients. Skin stitches were done individually with mattress sutures. Postoperative analgesia was provided with diclofenac sodium. All the patients were discharged on day 1 post operation after their drainage tube was pulled out. The stitches were removed on day 15 post operation. In order to evaluate patient satisfaction and wound features, patients were invited to the hospital in the first week, first month, and third month post operation. Wound infection, wound separation, abscess formation, VAS pain scores, and VAS satisfaction scores of all patients were documented at each visit.

All patients in the second group were invited for a second epilation session in the third week post operation, during which they were instructed to keep the operation site clean. The patients were contacted 1 year after the surgery via telephone by two independent researchers (one being a nurse who was blind to this study). The patients were asked if they had any complaints about the surgery, if infection or abscess formation took place, and if relapses occurred, and the answers were documented. SPSS version 17.0 (SPSS Inc., Chicago IL, USA) was used for statistical analyses. Chi-square and Mann-Whitney U tests were performed for categorical

Table 2. Results in the first week post operation

Patient's Characteristics	Group I (n=30)	Group II (n=30)	P
Surgical site infection			
Yes	2	6	0.1
No	28	24	
Wound separation			
Yes	0	3	0.1
No	30	27	
Abscess formation			
Yes	1	4	0.1
No	29	26	
VAS Pain Score	2.3±0.3	3.2±0.3	0.03
VAS Satisfaction Score	7.2±0.2	7.9±0.2	0.01

Table 3. Results in first month post operation

Patient's Characteristics	Group I (n=30)	Group II (n=30)	P
Surgical site infection			
Yes	5	5	1.0
No	25	25	
Wound separation			
Yes	1	5	0.07
No	29	25	
Abscess formation			
Yes	1	5	0.07
No	29	25	
VAS Pain Score	1.1±0.2	2.5±0.2	0.0001
VAS Satisfaction Score	8.3±0.2	7.5±0.2	0.07

and continuous variable analyses. A value of $P < 0.05$ was accepted as a significant value.

Results

Sixty patients aged 15 to 46 were enrolled in this study. Of the 60 patients, 45 were men and 15 were women. The patients were divided into two groups according to the aforementioned criteria. There were no statistically significant differences between the groups (**Table 1**).

There were no statistically significant differences between the two groups in the first week post operation considering the wound site infection symptoms, wound separation, and abscess formation. The VAS pain score was significantly lower in the surgery group (2.3 ± 0.3) compared to the surgery + epilation group (3.2 ± 0.3) ($P < 0.03$). The VAS satisfaction score also was significantly lower in the surgery group (7.2 ± 0.2) compared to the surgery + epilation group (7.9 ± 0.2) ($P < 0.01$) (**Table 2**).

There were no statistically significant differences between the two groups in the first month post operation in regard to wound site infection symptoms, wound separation, abscess formation, and VAS satisfaction scores. VAS pain scores were significantly lower in the surgery group (1.1 ± 0.2) compared to the surgery + epilation group (2.5 ± 0.2), similar to the results of the first week post operation ($P < 0.001$) (**Table 3**).

There were no statistically significant differences between the two groups in the third month post operation regarding wound site infection symptoms, wound separation, abscess formation, and VAS satisfaction scores. VAS pain scores were significantly lower in the surgery group (0.6 ± 0.1) compared to the surgery + epilation group (1.4 ± 0.2), similar to the results of the first week and first month post operation ($P = 0.003$) (**Table 4**).

In the telephone interviews done 1 year after the surgery, recurrence was detected in 1 patient in the surgery group (4%) and in 6 patients in the surgery + epilation group (20%).

Recurrence rates were significantly higher in the surgery and epilation group ($P = 0.045$).

Discussion

Although many surgical methods have been defined for pilonidal sinus disease, relapse rates have not been satisfactorily reduced to date. The hair is held responsible as the most important etiological factor for this disease. With the development of laser epilation technology in recent years, some research has reported that relapse rates can be reduced by removing the hair in combination with surgery. Relapse rates with surgical procedures have reported to be between 1 and 38% [6, 13]. Some studies investigated the effects of laser epilation to and around the intergluteal sulcus before or after surgical procedures on relapses and wound healing in pilonidal sinus disease. All these studies were solely done retrospectively, and therefore, their evidence values are

Table 4. Results in third month postoperative

Patient's Characteristics	Group I (n=30)	Group II (n=30)	P
Surgical site infection			
Yes	4	4	1.0
No	26	26	
Wound separation			
Yes	5	4	0.7
No	25	26	
Abscess formation			
Yes	1	1	0.6
No	29	29	
VAS Pain Score	0.6±0.1	1.4±0.2	0.003
VAS Satisfaction Score	8.1±0.1	7.8±0.1	0.06

notably low in the sense of patient screening criteria and the distribution of patient groups. Our study is the first prospective randomized clinical research to date, and it can be seen that it is free of bias.

Badawy and Kanawati applied laser epilation after surgical wound healing to 15 of their patients, while 10 patients were in the control group in their 25 patient study. They reported no relapses in the laser epilation group, while 7 relapses were seen in the control group after a 12-23 month follow-up period. The surgical procedure in the study was reported to be excision + primary closing or excision + secondary recovery [10].

Another retrospective study by Conroy *et al.* applied 3 or more sessions of laser epilation to 12 patients for 6 months. They reported no relapses after a 1 year follow-up [11]. Lukish *et al.* applied Nd-YAG laser epilation in addition to surgery in 28 patients and reported 1 relapse in a 24 month follow-up period in their retrospective study [12]. Oram *et al.* applied epilation with an alexandrite laser device to 60 pilonidal sinus patients after different surgical procedures in their retrospective study. They reported starting the laser epilation 4 weeks after the surgery and applied the procedure 2-5 times in a 6-8 week period. The relapse rates were 13.3% after 4.8 years of follow up, and the lowest relapse rate was seen in the excision + flap reconstruction group (7.3%) [13].

Peterson *et al.* discharged the operated patients with the suggestion of razor epilation. They reached 504 of the patients, and 113 of

them applied razor epilation, for which the relapse rates were 30%. Of the 391 patients that did not apply razor epilation, postoperative relapses were seen in 19.7% of the patients. Therefore, razor epilation is thought to increase the relapse rates in these patients [14]. Ghnnam and Hafez applied 4 sessions of laser epilation after wound healing to 45 patients and razor epilation or a depilatory to 41 patients. The study was a prospective randomized study of 86 patients, who were subjected to excision and secondary healing. No relapses were seen in the laser epilation group, while 2 relapses were detected in the other with statistically insignificance [15].

These studies show that the relapse rates in laser epilation patients are 0-13%, while it was approximately 19-70% in patients to whom laser epilation was not applied. In our prospective randomized study, the relapse rates in the surgery-only group and the surgery + laser epilation group were 4% and 20%, respectively. Our results are completely dissimilar from those of all the retrospective studies concerning the relapse rates after laser epilation following pilonidal sinus surgery. A 4% relapse rate was detected in the surgery-only group, which was similar to the reported relapse rates of excision + flap reconstruction surgical procedures in the literature. However, in our study, increased relapse rates in the group in which laser epilation and surgery were performed can be clearly seen, but it is not clear by which mechanism the relapse rates are increased and what sort of damage it causes in the surgical site.

Oram *et al.* emphasized that applying laser epilation has a negative effect on postoperative epithelialization and completion of wound healing. They suggested the application of laser epilation at least 4 weeks following surgery [13]. Badavy and Ghnnam also reported that it is wise to wait for wound healing to be completed before starting laser epilation [10, 15]. No consensus can be seen in other studies regarding the timing of laser epilation and whether to do it before or after the surgery. On the other hand, differences are seen in regard to different surgical procedures and their relapse rates [16,

17]. Oram *et al.* found that the recurrence rates of laser depilation performed after various surgical procedures are dissimilar [13]. A lack of multi-directional prospective randomized trials in this subject and the low significance of retrospective studies prevent us from respectable interpretation of their results.

As a conclusion, there are many different outcomes reported regarding relapse rates after pilonidal sinus surgery in the literature. Many surgical techniques have been developed to reduce these relapse rates, and many retrospective studies have examined the effect of laser epilation on relapse rates in recent years. Our results show that laser epilation does not reduce the relapse rates in pilonidal sinus surgery, as expected. Still, it is obvious that prospective randomized studies need to be held on this subject.

Disclosure of conflict of interest

None.

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