

ORIGINAL ARTICLE

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Comparison of success rates of laser surgery and crystallized phenol treatment in pilonidal sinus treatment

 Bulent Halaclar*Algomed Hospital, General Surgery Department, Adana, Türkiye*

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Abstract

The main purpose of this study is to compare the efficacy of crystallized phenol and laser among treatment options in pilonidal sinus (SPS) discomfort in the sacrococcygeal region. A total of 190 patients were included in this retrospective archive research. Moreover, cases with missing or unclear data were not included in the study. Most patients were men [123 (64.3%) vs. 67 (35.3%); $p < 0.001$]. There was no difference between the two groups in terms of age [31.37 ± 8.92 vs. 31.20 ± 8.85 ; $p = 0.92$]. The majority of those who have applied laser were men [80 (80%) vs. 20 (20%); $p < 0.001$]. It was determined that the majority of those who underwent laser were smokers [38 (67.9%) vs. 18 (32.1%); $p < 0.007$]. The rate of phenol application was found to be slightly higher in females [47 (52.2%) vs. 43 (47.8%)]. In terms of comorbidity, there was no difference between the cases treated with phenol and laser [14 (40%) vs. 21 (60%); $p = 0.33$]. There was no statistically significant difference in terms of the 12th month [84 (46.4%) vs. 97 (53.6%); $p = 0.312$] or 24th month [82 (46.1%) vs. 92 (53.9%); $p = 0.167$] recurrence rates for cases treated with phenol and laser. Moreover, there was no statistically significant difference between the two groups for cases who had reoperation [phenol: 13 (61.9%) vs. laser: 8 (38.1%); $p = 0.157$]. Bleeding after the procedure was detected only in patients who underwent laser [0 (0.0%) vs. 6 (100%); $p < 0.03$]. There was no difference in terms of infection in both groups [3 (50%) vs. 3 (50%); $p = 1.00$]. With regard to the body mass index, no difference was found between the two groups that were treated with phenol or laser. However, regarding the visual analog scale (VAS), it was significantly lower in the phenol group [1.38 ± 1.63 vs. 0.87 ± 1.37 ; $p = 0.002$]. In conclusion, while phenol is more advantageous in terms of pain and bleeding complications, laser treatment is preferred in men and smokers.

Keywords: Pilonidal sinus, laser surgery, crystallized phenol treatment, surgical success

Introduction

Sacroccygeal pilonidal sinus (SPS) disorder is a common ailment, especially in men. It is more common in cases where there is excessive hair density in the intergluteal region, low socialability, insufficient self-care and sitting for a long time. SPS disease is more commonly observed in male and young population, three to four times higher than in female population [1-3]. In the literature, in the management of pilondal sinus; it has been reported that the pain situation after the application is low, the method can be applied with local anesthetics, and of course, it should include methods that have low recurrence rates and are advantageous in terms of cost [4,5].

In fact, both laser and phenol applications should include most of the above features in order to be performed as an official procedure. When the laser applications are examined, it is seen that the hair surrounding the pilonidal sinus is removed from the environment, thanks to laser epilation [6,7]. This will reduce the risk of recurrence, especially since it weighs an advantage in terms of hygiene [7]. Another method applied to remove hair in pilonidal sinus treatment is phenol application. One of the minimally invasive methods currently defined for pilonidal sinus in the literature is curettage of the sinus cavity and then filling with phenol or fibrin glue [8]. In this study, the results obtained by comparing the application of the laser probe combined with the endoscopic pilonidal sinus treatment with the application of

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Corresponding Author: Bulent Halaclar, Algomed Hospital, General Surgery Department, Adana, Türkiye
Email: halaclarbulent01@gmail.com

pilonidal sinus curettage and phenol are shared with the literature.

Material and Methods

A total of 190 patients were included in the research, which was planned as a retrospective archive search and approved by the ethics committee (decision number 134, dated June 2, 2023). Patients over 16 years old with primary PS cases were evaluated, while those who had chronic diseases such as cancer, dibetes mellitus, or chronic hipertension, as well as cases with missing or unclear data were not included in the study. All patients were hospitalized on the day of surgery. No patient was given prophylactic antibiotics. Local anesthesia was applied to all patients.

Complete wound healing was defined to be the complete closure of the wound, without any spontaneous or palpable discharge, any infections and VAS pain score. PS recurrence was compared for both methods separately at both 12th months and 24th months.

Surgical procedure

In the surgical procedure, the sinus orifices of the patients in the prone position were revealed after the application of local anesthesia. Sinus extension was investigated with the aid of a flexibly thin probe. Afterwards, sinus cavities were evaluated by dilating the sinus opening so that the microprobe could pass through the endoscope. After the hairs in the pathways to the PS and in the PS were removed, curettage was applied to the remaining sinus floor. Subsequently, it was observed again with the endo camera, and if there was any residual hair, it was taken under direct vision. 1% glycine solution was preferred for washing the sinus cavity and endo camera. A radial laser probe with a wavelength of 1470 nm was placed on the cleaned pilonidal sinus floor and pathways, and an average of 100 joules of energy at 10 watts was applied to 1 cm long areas. The laser probe was withdrawn 1 cm and the process was terminated. In the phenol group, the procedure was terminated by cauterization of all walls with a monopolar cautery placed from the endo camera with direct visual support, and after this procedure, phenol was placed in all pilonidal sinus tracts and pilonidal sinus cavity.

Statistical analysis

Since the distribution in terms of continuous variables conforms to the normal distribution using the Kolmogrov-Smirnov test; Student's t test was used for independent groups for continuous variables. Binary variables were evaluated with the X2 test. In addition, binary variables were presented as percent (%) and continuous variables were presented as mean±standard deviation (SD) as well as minimal and maximal values.

Results

There was no age difference between the laser and phenol groups [31.37±8.92 vs. 31.20±8.85; p=0.92] (Table 1). In terms of VAS pain score, the pain score was significantly lower in the phenol group [1.38±1.63 vs. 0.87±1.37; p=0.002] (Table 2). The majority of those who underwent laser treatment were males compared to

females [80 males (80%) vs. 20 females (20%); p<0.001] (Table 1). Also, the majority of those who underwent laser were smokers, and it was statistically very significant [38 smokers (67.9%) vs. 18 nonsmokers (32.1%); p<0.007] (Table 1).

Table 1. Demographic data of the patients

	Treatment method		Total
	Laser	Phenol	
Mean age	31.37±8.92	31.20±8.85	–
Gender (female vs. male)	20 (20%) vs. 80 (80%)	47 (52.2%) vs. 43 (47.8%)	190 (100%)
Smokers	38 (67.9%)	18 (32.1%)	56 (100%)
Body mass index (30–40 vs. 25–30)	17 (17%) vs. 83 (83%)	8 (8.9%) vs. 82 (91.1%)	190

Table 2. The comparison of the age and VAS with regard to the treatment method

	Phenol vs. Laser	n	Mean±SD	p<0.005
Age	1.00 (Laser)	100	31.37±8.92	0.92
	0.00 (Phenol)	90	31,20±8.85	
VAS	1.00 (Laser)	98	1.38±1.63	0.002
	0.00 (Phenol)	87	0.87±1.37	

VAS: visual analogue scale, SD: standard deviation

In terms of comorbidity, there was no difference between the cases treated with phenol and laser [14 (40%) vs. 21 (60%); p=0.33] (Table 3). There was no statistically significant difference in terms of the 12th month pilonidal sinus recurrence rates of cases treated with phenol and laser [84 (46.4%) vs. 97 (53.6%); p=0.312]. That is, there was no difference between the two methods in terms of recurrence at 12 months. Similarly, there was no statistically significant difference in the rate of recurrence of pilonidal sinus at the 24th month of cases treated with phenol and laser [82 (46.1%) vs. 92 (53.9%); p=0.167]. In other words, there was no difference in terms of recurrence between both methods at the 24th month. On the other hand, although there is no statistically significant difference, the number of recurrences at both the 12th and 24th months was higher in cases treated with phenol than in cases treated with laser (Table 4).

Table 3. Comparison of the comorbidity with regard to the treatment method

Comorbidity status	Phenol vs. Laser		Total	p<0.05
	0.00	1.00		
–	76 (49%)	79 (51%)	155 (100%)	0.33
+	14 (40%)	21 (60%)	35 (100%)	
Total	90 (47.4%)	100 (52.6%)	190 (100%)	

Table 4. Comparison of the 12th and 24th month recurrences after procedures

Recurrence		Phenol vs. Laser		Total	p<0.05
		0.00	1.00		
12th month	–	84 (46.4%)	97 (53.6%)	181 (100%)	0.312
	+	6 (66.7%)	3 (33.3%)	9 (100%)	
	Total	90 (47.4%)	100 (52.6%)	190 (100%)	
24th month	–	82 (46.1%)	96 (53.9%)	178 (100%)	0.167
	+	8 (66.7%)	4 (33.3%)	12 (100%)	
	Total	90 (47.4%)	100 (52.6%)	190 (100%)	

While bleeding after the procedure was found to be statistically significant only in cases where laser was applied, no bleeding cases were detected in the phenol group [0 (0.0%) vs. 6 (100%); p<0.03] (Table 5). No statistically significant difference was found between the two groups in terms of cases who had reoperation [13 phenol (61.9%) vs. 8 laser (38.1%); p=0.157] (Table 5); however, as seen in Table 3, recurrence was more common in the phenol group. On the other hand, there was no

difference in terms of infection in both groups [3 (50%) vs. 3 (50%); p=1.00] (Table 5).

Finally, the results are compared in terms of the body mass index (BMI). The patients are divided into two groups as 30-40 kg/m2 and 25-30 kg/m2 and the results are reported in Table 6. Although there is no statistical significance, it was found to be close to the confidence interval.

Table 5. Comparison of the treatment methods with regard to post procedure bleeding and infection, and reoperation requirements after procedures

		Phenol vs. Laser		Total	p<0.05
		0.00	1.00		
Bleeding	0.00	90 (48.9%)	94 (51.1%)	184 (96.8%)	0.03
	1.00	0 (0.0%)	6 (100%)	6 (3.2%)	
	Total	90 (47.4%)	100 (52.6%)	190 (100%)	
Infection	–	87 (47.3%)	97 (52.7%)	184 (96.8%)	1.00
	+	3 (50%)	3 (50%)	6 (3.2%)	
	Total	90 (47.4%)	100 (52.6%)	190 (100%)	
Reoperation	–	77 (45.6%)	92 (54.4%)	169 (100%)	0.157
	+	13 (61.9%)	8 (38.1%)	21 (100%)	
	Total	90 (47.4%)	100 (52.6%)	190 (100%)	

Table 6. Comparison of the treatment methods with regard to body mass indexes

BMI	Phenol vs. Laser		Total	p<0.05
	0.00	1.00		
30–40 kg/m²	8 (32%)	17 (68%)	25 (100%)	0.09
25–30 kg/m²	82 (49.7%)	83 (50.3%)	165 (86.8%)	
Total	90 (47.4%)	100 (52.6%)	190 (100%)	

Discussion

Pilonidal sinus is a disturbing and quality-of-life disease. Besides, it is a surgical disease that is more common in the male population, usually between the ages of 15 and 30. Different methods are still being compared to achieve the best treatment results. Minimally invasive surgical methods are gaining more popularity and are favored by some authors [8-11].

The mean age of the patients in this study (31.29±8.36 years) was found to be higher than the literature (Tables 1 and 2), as the

mean values in similar studies are reported as 28±10 years and 22.5±6.4 years [1,7].

Dessily et al. (2017) reported that the pilonidal sinus may create a risk of pain and local sepsis [10]. While obesity, family history, diet, male gender, prolonged sitting and, poor hygiene are reported among the main risk factors in the formation of PSD, the most important risk factor is excessive hair growth in the birth cleft [7]. The results in this study indicate that smoking, gender, and high BMI are prominent in men, and additionally men are at the forefront in laser treatment (Tables 1-2).

In terms of pain, laser treatment has been stated to be superior in the literature [1,12]. In our study, especially the VAS pain score had been found to be significantly lower in the laser group (Table 2). This study also suggests that the gender in more cases are males and the preference of men for laser treatment is due to excessive hair density in the sacrococcygeal area, which is more common especially in men, as stated above. No difference was found between the phenol and laser groups in terms of comorbidity in this study, which is consistent with the literature (Table 3).

Although Uzunoglu and Yalkin (2022) stated that they did not find a difference between phenol and laser application in terms of recurrence, they furthermore stated that a one-unit increase in the recurrence risk, especially in the number of sinus tracts, reduces the recurrence risk by 65%, whereas a one-unit increase in the distance to the orifice increases the recurrence in the midline 1.22 times [13]. No significant difference was found between the literature [1,12] and our study in terms of recurrence (Table 4). However, although it was not statistically significant, the recurrence rate was higher in the phenol group at both 12 and 24 months.

In this study, bleeding complications were observed in laser applied cases, while no bleeding complications were found in phenol applied cases (Table 5), unlike the literature [1].

The need for reoperation was similar to the literature [1], with recurrence rates in both the phenol and laser groups. On the other hand, although it was not statistically significant, the number of reoperated cases was higher in the phenol group than in the laser group (Table 5).

Finally, no difference was found in this study between crystallized phenol or laser treatment in terms of both infection and body mass index (Tables 5 and 6), in accordance with the literature [13].

Conclusion

Phenol application is found to be the more advantageous method in terms of both pain and bleeding when compared to laser application. On the other hand, the laser therapy is a current application that is more frequently preferred by smokers and men. As a final statement, multicenter prospective studies are recommended to be performed at a later stage.

Conflict of Interests

The authors declare that there is no conflict of interest in the study.

Financial Disclosure

The authors declare that they have received no financial support for the study.

Ethical Approval

Ethical approval for this study was obtained from Cukurova University Ethical Committee (Meeting ID: 134, Date: 02 June 2023).

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