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BACKGROUND: Pilonidal sinus is a common disease. Curative treatment is surgical excision. However, minimally invasive surgery is preferred day by day. Our study aimed to compare the effects of phenol and excision on postoperative results and quality of life in the treatment of pilonidal sinus.

METHODS: The patients who underwent surgery with the diagnosis of the pilonidal sinus in our clinic between June 2019 and June 2021 were examined. Demographic data, anthropometric measurements, clinical information, treatment, and postoperative data of the patients were recorded. Daily pain follow-up with daily visceral pain scale (VPS) was performed in the first ten days postoperatively, and a short form 36 (SF-36) questionnaire was used in the first and fourth weeks. The patients were grouped as phenol and excision groups and compared.

RESULTS: The study included 145 patients. Phenol was applied to 83 (57.2%) patients, and excision was applied to 62 (42.8%) patients. There was no statistically significant difference between the groups regarding age, gender, BMI, number of pilonidal sinuses, and family history ($p>0.05$). Return to work, painless walking and sitting on the toilet, and mean daily VPS values in the phenol group were significantly shorter than the excision group ($p<0.05$). All subscale values in the postoperative first week SF-36 results were significantly higher than in the excision group ($p<0.001$) in the phenol group.

CONCLUSION: Phenol is effective in the treatment of pilonidal sinus. Despite excision, treatment with phenol affects the patient's quality of life less in the early postoperative period.

KEY WORDS: Minimally invasive surgery, Pilonidal sinus, Phenol, Quality of life

Introduction

Pilonidal sinus is a suppurative disease located in the subcutaneous adipose tissue in the sacrococcygeal region, primarily seen in young men. Its treatment is primarily surgical, but there is no consensus on the ideal treatment and surgical technique ¹.

Surgical excision is the standard definitive treatment. However, postoperative pain, infection, prolonged wound healing, and prolonged return to work are undesirable

problems in treating pilonidal sinus. Because of these postoperative problems, new and minimally surgical techniques are being developed and researched ².

The ideal treatment desired in the pilonidal sinus is simple, practical, fast to be applied, and has minimal adverse postoperative effects. Recently, minimally invasive surgical interventions have been preferred, and research in this direction has increased ^{3,4}.

With the development of medical technology, new instruments (laser, video camera) and techniques are used in the pilonidal sinus ⁵. One of the minimal treatment methods used in the treatment of pilonidal sinus is the application of phenol. Phenol is a cheap and readily available chemical. Therefore, phenol is a practical and straightforward technique in treating pilonidal sinus ⁶.

Our study aimed to compare the effects of surgical excision and phenol on postoperative outcomes and quality of life in pilonidal sinus disease.

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Materials and Methods

Patients who were operated on for pilonidal sinus in the General Surgery Department of our hospital between June 2019 and June 2021 were examined. Patients who underwent primary closure after the sinus tract was removed after the diagnosis of pilonidal sinus and only phenol was administered were included in the study. Patients with recurrent pilonidal sinus, abscess, and active infection and those who underwent Karydakos or Limberg flaps were excluded from the study.

PATIENT DATA

Demographic (age, gender) data of the patients, anthropometric measurements (weight, height), body mass index, number of pilonidal sinuses, treatment applied, duration of operation, postoperative follow-up period, and data on recurrence of the disease during the follow-up were recorded. Postoperative return to work, pain-free walking, and pain-free toilet sitting time were recorded. In the first ten days postoperatively, daily pain was followed up with the daily visceral pain scale (VPS) and recorded. Short Form 36 (SF-36) and quality of life questionnaire was administered face to face in the first week and the fourth week postoperatively.

PHENOL AND SURGICAL EXCISION TECHNIQUE

Before the treatment, the patients were informed about the treatment. Phenol was administered under local anesthesia and sedation. It was entered through the mouth

of the pilonidal sinus located in the sacrococcygeal area. Remains and hair in the cavity were cleaned with a mosquito clamp. Depending on the size of the cavity, 150 to 250 mg of crystalline phenol was placed without contacting the skin. After waiting three minutes, the crystallized phenol solution and residues were removed by applying pressure with dry gauze. The skin was washed with an antiseptic solution and covered with a dressing. Surgery was performed under spinal anesthesia and sedation. At least 5 mm of the cyst, including the pilonidal sinus orifices, was excised with clean tissue. The defect area was left for secondary healing.

ETHICS COMMITTEE APPROVAL

The study was presented to the Mersin University Faculty of Medicine Clinical Research Ethics Committee, and ethics committee approval (ethics committee no: 2021/628) was obtained.

STATISTICAL ANALYSIS

In the data analysis, the mean, standard deviation, and median values were used while making the statistics of the continuous data in the scales. Frequency and percentage values were used to define categorical variables. Chi-square test statistics were used to evaluate the relationship between categorical variables. Independent samples t-test statistic was used to compare the means of two independent groups. Paired samples t-test was used to compare the measurements of two dependent groups

TABLE I - Demographic and clinical data of the patients

	All patients (n=145) x±SD	Phenol (n=83) x±SD	Excision (n=62) x±SD	p value
Age	25.1±5.7	24.4±5.7	25.9±5.6	0.11*
BMI	25.31±3.96	24.82±4.31	25.96±3.37	0.09*
Pilonidal sinus number	1.92±0.64	1.86±0.67	2.02±0.59	0.13*
Operation time	21.72±8.57	16.69±5.08	28.47±7.61	<0.001*
Postoperative follow-up time	18.48±3.42	18.18±3.63	18.87±3.09	0.23*
Return to work time	4.62±2.42	2.98±1.65	6.82±1.25	<0.001*
Pain-free walking	4.35±2.78	2.28±1.52	7.13±1.21	<0.001*
Pain-free toilet sitting	5.43±3.11	3.11±1.57	8.55±1.51	<0.001*
	n (%)	n (%)	n (%)	
Gender				
Male	129 (89)	11 (13.3)	5 (8.1)	0.32**
Female	16 (11)	72 (86.7)	57 (91.9)	
Family history				
Yes	25 (17.2)	14 (16.9)	11 (17.7)	0.89**
No	120 (82.8)	69 (83.1)	51 (82.3)	
Recurrent disease				
Yes	8 (5.8)	7 (8.4)	1 (1.6)	0.08**
No	137 (94.2)	76 (81.6)	61 (98.4)	

*Independent t-test, **Chi-square test

at two times. The statistical significance level of the data was taken as $p < 0.05$. In evaluating the data, www.e-picos.com New York software and MedCalc statistical package program were used.

Results

During the study, 169 patients were operated on with the diagnosis of the pilonidal sinus in our clinic. Eight patients diagnosed with recurrent pilonidal sinus, 13 patients with flaps (Karydakis, Limberg, and Rhomboid), and three patients with abscess or active infection were excluded from the study. Thus, 145 (85.8%) patients were included in the study.

The patients were divided into two groups as phenol and excision treated and compared according to the treatment applied. The mean age of the patients in the phenol group was 24.4 ± 5.7 years, while it was 25.9 ± 5.6 years in the excision group. While BMI was 24.82 ± 4.31 in the phenol group, it was 25.96 ± 3.37 in the excision group. While the mean of the pilonidal sinus was 1.86 ± 0.67 in the phenol group, it was 2.02 ± 0.59 in the excision group. A family history of the pilonidal sinus was present in first-degree relatives in 14 (16.9) patients in the phenol group and 11 (17.7%) patients in the excision group. There was no statistically significant difference between the groups regarding age, gender, BMI, number of sinuses, and family history ($p > 0.05$) (Table I).

When the groups were compared in terms of the operation time, it was 16.69 ± 5.08 minutes in the phenol group and 28.47 ± 7.61 minutes. The postoperative follow-up period was 18.18 ± 3.63 months in the phenol group, while it was 18.87 ± 3.09 months in the excision group. The mean time to return to work postoperatively was 2.98 ± 1.65 days in the phenol group, while it was 6.82 ± 1.25 days in the excision group. Patients were able to walk without pain postoperatively, on average 2.28 ± 1.52 days in the phenol group and 7.13 ± 1.21 days in the excision group. They could sit on the toilet without pain in 3.11 ± 1.57 days in the phenol group and 8.55 ± 1.51 days in the excision group. While pilonidal sinus recurrences were detected in 7 (8.4%) patients in the phenol group, they were detected in 1 (1.6%) patient in the excision group (Table I).

There was no difference between the groups regarding postoperative follow-up time ($p = 0.23$). However, there was a statistically significant difference between the groups regarding duration of operation, time to return to work postoperatively, pain walking, and sitting on the toilet ($p < 0.05$) (Table 1). The groups were compared according to the evaluation of pain in the sacral area by VPS in the first ten days postoperatively. On the first day of the patients in the phenol group, the mean pain was 3.2 ± 1.1 and gradually decreased. In the excision group, the mean pain on the first day was 4.6 ± 2.1 and decreased. According to the daily VPS averages, there was a statistically significant difference between the

TABLE II - Quality of life measurements of the patients in the postoperative first and fourth weeks

	Phenol		p-value*	Excision		p-value*
	First week	Fourth week		First week	Fourth week	
Physical functioning	71.3±14.5	84.6±9.9	<0.001	52.8±6.9	81.4±18.9	<0.001
Role limitations due to physical health	68.7±13.9	80.4±14.1	<0.001	53.8±6.8	75.7±20.1	<0.001
Role limitations due to emotional problems	64.3±20.1	87.6±17.2	<0.001	55.4±15.4	83.4±17.9	<0.001
Energy/fatigue	68.6±4.4	72.7±9.2	<0.001	55.3±8.9	71.2±11.6	<0.001
Emotional well-being	75.2±11.7	77.9±11.9	<0.001	58.8±5.9	71.9±13.4	<0.001
Social functioning	73.2±4.4	85.1±13.5	<0.001	54.1±5.8	84.9±17.7	<0.001
Pain	66.5±3.1	84.1±17.2	<0.001	59.4±9.7	77.4±20.6	<0.001
General health	66.3±6.3	74.5±11.8	<0.001	55.6±8.1	71.1±17.1	<0.001

*Paired sample t-test

TABLE III - Comparison of quality of life measurements in the first and fourth weeks of the patients in the phenol and excision group

	First week		p-value*	Fourth week		p-value*
	Phenol	Excision		Phenol	Excision	
Physical functioning	71.3±14.5	52.8±6.9	<0.001	84.6±9.9	81.4±18.9	0.18
Role limitations due to physical health	68.7±13.9	53.8±6.8	<0.001	80.4±14.1	75.7±20.1	0.94
Role limitations due to emotional problems	64.3±20.1	55.4±15.4	<0.001	87.6±17.2	83.4±17.9	0.15
Energy/fatigue	68.6±4.4	55.3±8.9	<0.001	72.7±9.2	71.2±11.6	0.39
Emotional well-being	75.2±11.7	58.8±5.9	<0.001	77.9±11.9	71.9±13.4	0.005
Social functioning	73.2±4.4	54.1±5.8	<0.001	85.1±13.5	84.9±17.7	0.94
Pain	66.5±3.1	59.4±9.7	<0.001	84.1±17.2	77.4±20.6	0.04
General health	66.3±6.3	55.6±8.1	<0.001	74.5±11.8	71.1±17.1	0.16

*Independent t-test

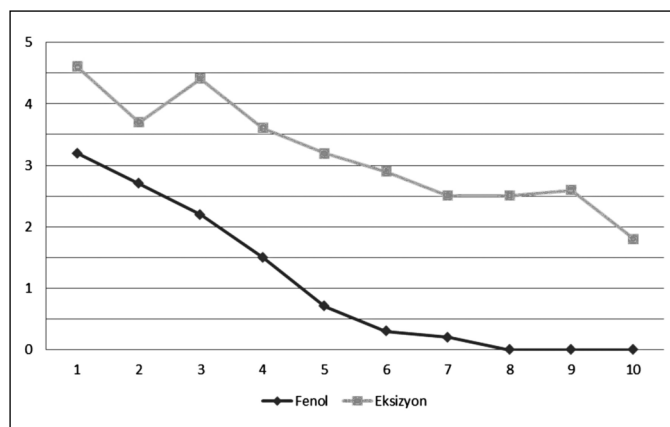


Fig. 1: Mean postoperative 10-day visceral pain scale scores of the patients according to the groups.

groups ($p < 0.001$) (Fig. 1). The SF-36 questionnaire was applied in the first and fourth weeks postoperatively. The groups were evaluated among themselves and mutually. Patients were evaluated according to weeks and groups. In all sub-evaluations of SF-36 in both the phenol group and the excision group, the fourth-week measurements were statistically significantly higher than the first-week measurements ($p < 0.001$) (Table II).

In the SF-36 survey results performed at the first postoperative week, all subscale values in the phenol group were statistically significantly higher than in the excision group ($p < 0.001$). While there was a significant difference in emotional well-being and pain results between the groups at the fourth postoperative week, there was no statistically significant difference between the groups in terms of other subscales ($p = 0.005$, $p = 0.04$, and $p > 0.05$, respectively) (Table III).

Discussion

Pilonidal sinus is a common disease. It is mainly seen in young men between the ages of 15–35. Pilonidal sinus may cause pain, sepsis, and decreased quality of life (5–5). Risk factors for pilonidal sinus are young age, male gender, hairiness, deep antenatal sulcus, poor hygiene. The etiology of pilonidal sinus is not definite. However, it is clinically detected with sinus opening or infected abscess in the sacrococcygeal area (7).

Clinical manifestations are pain, tenderness, and foul-smelling discharge. The definitive treatment of pilonidal sinus is wide excision. However, the disadvantages of wide excision are also quite numerous. Examples include pain, infection, being away from work, depression, and staying away from social life until full recovery (8).

Surgical methods include the opening closure formed after excision of pilonidal sinus treatment with secondary healing, primary or flap closure. The desired ideal treatment is minimally invasive, inexpensive, simple, and easy

to apply. The goals after treatment are rapid recovery, early return to work, less pain, limitation, and recurrence (9,10).

In the treatment of pilonidal sinus, the postoperative effects of minimally invasive treatments are quite satisfactory compared to wide excision. In the study of Giuseppe et al., the results of excision and diathermy excision were compared. It has been reported that diathermy is better than excision in terms of postoperative pain, recovery, and quality of life (11). Furthermore, Ertan et al. reported in a study evaluating the quality of life that the flap used in pilonidal sinus surgery is better than primary closure (12).

There is also a minimally invasive method used for pilonidal sinuses, such as phenol. Less invasive and aggressive treatment regimens have become more prevalent in the treatment of pilonidal sinus. Since phenol is fast, simple, and applicable, its use is widespread (13). Arslan et al. state that phenol treatment can be easily applied in the pilonidal sinus of children, and there is no need for pre-procedural preparations. In the treatment of pilonidal sinus, phenol application shortens the hospital stay after the procedure and provides less labor loss than surgical treatments (14).

Minimally invasive procedures in the treatment of pilonidal sinus negatively affect life less in the postoperative period than wide excision. Furnée et al. showed in a randomized controlled study that phenol application in the treatment of pilonidal sinus could return to work earlier than excision treatment and increase the quality of life (15). Topuz et al. reported in a prospective randomized clinical study that pilonidal sinus phenol therapy was better than other excision therapy in terms of postoperative pain, being away from school and social life, and quality of life (16). In our study, the duration of the operation, returning to work, walking without pain, and sitting on the toilet was shorter in the phenol group. Therefore, it has been interpreted that phenol treatment has fewer postoperative adverse effects and provides faster recovery compared to the operation.

Henry et al. stated in their study that pilonidal sinus has a profound effect on the quality of life and that minimally invasive treatment removes the adverse effects on quality of life (17). Pronk et al. stated in their randomized controlled clinical study that the application of phenol in the pilonidal sinus resulted in a faster return to normal daily activities, less pain, and faster wound epithelialization (18). Our study observed that the patients' quality of life in both the phenol and excision groups increased over time in the postoperative period. Therefore, it has been interpreted as increasing the patients' quality of life after wound healing.

Patient satisfaction is better than after minimally invasive surgery compared to extensive surgical procedures. In the study conducted by Giarratano et al., it was stated that the long-term results of a video-assisted minimally invasive technique in the pilonidal sinus would

result in an early return to daily activities, good aesthetic results, and a low recurrence rate. The overall satisfaction rate of the patients was 97%¹⁹. In the study of Milone et al, the video-assisted minimally invasive surgical technique had less time to return to work and less recurrence rate than traditional surgical treatment. In addition, they stated that while the operation time was longer in video-assisted minimally invasive surgery, patient satisfaction was higher²⁰. Postoperative negative results of minimally invasive surgical techniques are low, and patient satisfaction is high.

It is aimed to increase the success rate after minimally invasive interventions are used together. The combined use of video-assisted minimally invasive intervention and phenol application is a new technique that has been investigated recently. The study conducted by Gecim et al. stated that endoscopic pilonidal sinus treatment combined with crystallized phenol treatment is safe and tolerated. Furthermore, it was stated that there was no recurrence during the follow-up period and provided rapid and permanent recovery²¹. The combined use of minimally invasive interventions reduces failure and increases patient satisfaction.

The use of phenol in the treatment of pilonidal sinus has better aesthetic results than other treatments. Demirel et al. applied topical crystalline phenol to the pilonidal sinus under local anesthesia and published its early and late results. They stated that the esthetic results were quite good in the early and late results of the study. A close correlation was found in the early and late results in terms of recurrence²². In our study, aesthetic results after treatment were not evaluated. When evaluated in terms of recurrence, the recurrence rate in the phenol group was relatively high in the excision group, but the difference between the groups was not statistically significant ($p=0.08$). Although the recurrence rate of the phenol method is high, it is an option that should be considered in treatment, as it can be applied with local anesthesia, treated as an outpatient, and without occupying the operating room.

Conclusion

Pilonidal sinus treatment is surgery. While wide surgical excision is the curative treatment, minimally invasive surgery is preferred. Phenol is effective in the treatment of pilonidal sinus disease. However, treatment with phenol affects the patient's quality of life less in the early postoperative period despite excision.

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