

# Comparison of excision and primary closure vs. crystallized phenol treatment in pilonidal sinus disease: A comparative retrospective study

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## Ethics Committee Approval

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All procedures in this study involving human participants were performed in accordance with the 1964 Helsinki Declaration and its later amendments.

## Conflict of Interest

No conflict of interest was declared by the authors.

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## Abstract

**Background/Aim:** Pilonidal sinus is an inflammatory condition that affects the intergluteal sulcus. Since there is no standard treatment for pilonidal sinus, comparative studies are needed. Our study aimed to comparatively evaluate the treatment success, postoperative complications and recurrence in excision/primary repair surgery and crystallized phenol application in pilonidal sinus disease.

**Methods:** A total of 376 pilonidal sinus patients over the age of 18 years who visited our general surgery clinic between January 2017-January 2020 were included in this retrospective cohort study. They were divided into two groups based on whether they underwent phenol treatment or surgery. The patients' age, body mass index (BMI), gender, number of pits, length of stay in the hospital, return to normal life, mean follow-up times, complications, and satisfaction data were recorded. At the end of the follow-up period, all patients were contacted by telephone and the recurrence rates were noted.

**Results:** Both groups were similar in terms of age, gender, and BMI ( $P>0.05$  for all). The mean age of 374 patients included in the study was 23.38 (4.9) years. The mean follow-up time was 25.47 months. Patients in the crystallized phenol group did not require hospitalization. In the primary repair group, the median length of hospital stay was 1.15 days. Complications such as wound infection, hematoma, and wound dehiscence were significantly less in the phenol group. The recurrence rates in the phenol and primary repair groups were 8% and 10%, respectively ( $P=0.326$ ). Return to normal life was significantly faster in the phenol group. The success rate in the phenol group was 92%.

**Conclusion:** Although the recurrence rates are similar, crystallized phenol therapy is superior to primary repair due to better wound healing rates, ease of application, and fewer complication rates. More than one application is recommended in phenol treatment.

**Keywords:** Pilonidal sinus disease, Crystallized phenol, Primary repair

## Introduction

Treatments for pilonidal sinus disease (PSD) are generally insufficient. Although many treatment modalities have been described for PSD, rapid recovery, minimal patient discomfort, and low recurrence rates are still not achieved [1,2]. There are many studies comparing various treatment methods, but the results obtained are inconsistent [3-7].

Anderson was the first to perform surgery in 1847 [8]. The first phenol application was made with liquid phenol in 1964, and solid phenol was later considered more appropriate due to high recurrence rates with the use of liquid form [9, 10].

Crystalline phenol is a normally solid agent that becomes liquid with body temperature. Apart from sclerosing the pilonidal sinus tract, it also has anesthetic and antiseptic properties. After administration, it irritates the tissue, contributes to the formation of granulation tissue, and causes healing with fibrosis [11, 12]. Studies conducted in recent years showed that better results were obtained with the application of flap techniques in surgery compared to primary excision methods. However, primary excision continues to be performed frequently in most centers [11, 13].

The aim of our study is to show the usability of the easily accessible phenol treatment in centers that currently perform excision and primary closure surgery, as well as evaluate the results of primary closure.

## Materials and methods

After the approval of the Keçiören Training and Research Hospital Clinical Research Ethics Committee (08.12.2020) was obtained with the decision number 2012-KAEK-15/2201, our study was conducted retrospectively per the Helsinki declaration, and written informed consent was obtained from all patients. A total of 526 PDS patients over the age of 18 years who presented to the general surgery clinic between January 2017-January 2020 were included in the study. Patients with recurrent pilonidal sinus disease an unavailable data, those who underwent other surgical procedures for pilonidal sinus, patients with chronic diseases (diabetes, hypertension, etc.) that impair wound healing, a history of radiotherapy to the pelvic region, malignancy, those under steroid therapy, patients with coagulopathy, drug allergy, complicated PSD and abscess were excluded from the study. A total of 376 patients with complete data who fulfilled the criteria were included.

Age, gender, number of pits, postoperative complications (wound dehiscence, infection, and hematoma), length of hospital stay, and body mass index (BMI) were recorded from the patient files and the hospital information system. The number of times the patients underwent phenol treatment was noted. Then, the 2-year recurrence rates of all patients were inquired via telephone, computer records, or during follow-ups. The patients were divided into two as those who received the phenol treatment or primary closure.

### Phenol treatment

After sterilization of the area around the pilonidal sinus, local anesthesia was achieved with peripheral nerve block and filtration anesthesia using lidocaine (concentration 20 mg/ml). All hairs in the sinus tract were removed.

The area to be treated and its surroundings were protected with an antibiotic cream so that it would not be damaged during the phenol application. In this process, antibiotic-free creams that reduce irritation and burning effect can also be used. The sinus opening was expanded with mosquito clippers if it was less than 3 mm wide. A surgical curette was used to clean the sinus tract. Then, approximately 5-6 grams of phenol was administered to the tract three times. The procedure was terminated by dressing. A follow-up clinical examination was performed 10 days later. No extra procedures were performed to the patients whose sinuses were completely closed. Phenol application was continued for a maximum of 3 times in patients with open sinus tracts. The closure of the cavity and the absence of discharge were considered cure. The creation of new sinus orifices after healing was defined as recurrence.

### Surgical procedure

The patients were operated in the prone position with local anesthesia under local operating room conditions. Local anesthesia was achieved with peripheral nerve block and filtration anesthesia using lidocaine (concentration 20 mg/ml). Methylene blue was injected into the tract to show the boundaries. After primary excision was completed, the layers were closed primarily. The closure of the cavity and the absence of discharge were considered cure. The occurrence of new sinus orifices after healing was defined as recurrence.

### Statistical analysis

Data analysis was performed using SPSS for Windows 22 (Chicago, IL, USA) package program. The Kolmogorov-Smirnov test was performed to test whether the data were normally distributed. Categorical variables were presented with frequency distribution (numbers and percentages) and descriptive statistics were used for numerical variables. The Mann-Whitney U test was used to assess differences in numerical variables between the groups, and the Chi-square test was used to compare categorical variables. A *P*-value of <0.05 was considered significant.

## Results

The mean age of 374 participants was 23.38 (4.9) years (range: 18-54 years). The average time of follow-up was 25.47 months (range: 20-35 months). Table 1 shows the demographic features of the patients.

Table 1: The demographic characteristics and findings according to the treatment groups

	Crystallized phenol group (n=187)	Simple primary closure group (n=188)	<i>P</i> -value
Age, y, mean (SD)	24.83(4.77)	24.44(3.91)	0.664*
BMI, kg/m <sup>2</sup>	23.21(3.14)	22.87(2.78)	0.316*
Gender, n, (%)			
Male	123(65.77%)	131(69.68%)	
Female	64 (34.23%)	57(30.32%)	
Length of hospital stay, d, median(range)	0	1.15(0-5)	<0.001*
Complications, n (%)			<0.001†
Wound infection	3(1.6%)	69(36.65%)	
Hematoma	3(1.6%)	32(17.02%)	
Wound dehiscence	0	23(12.23%)	
Back to normal life, d median (range)	0	14 (7.4%)	
Recurrence, n (%)	1(1-20)	5(1-40)	<0.001*
Follow-up, mean (range)	15 (%8)	19 (%10)	†0.326
Number of phenol applications	25.19(20-35)	25.75(22-30)	*0.110
1	69(36.89%)	0	
2	85(45.46%)	0	
3	33(17.65%)	0	

\*Mann-Whitney U test, †chi-square test, BMI: Body mass index

In terms of age, gender, BMI, recurrence, and follow-up duration, there was no significant difference between the groups (Table 1). In the primary closure group, the length of hospital stay was significantly longer ( $P<0.001$ ). Patients in the crystallized phenol group did not require hospitalization. In the primary closure group, the median length of hospital stay was 1.15 days (median, 0-5 days).

However, complications such as wound infection, hematoma, and wound dehiscence were significantly less common in the phenol group ( $P<0.001$ ). While complications were observed in 3 (1.6%) patients in the phenol group, wound infection also occurred in these three patients. Complications were observed in a total of 69 (36.65%) patients in the primary closure group. Wound infection was observed in 32 (17.02%) patients, hematoma in 23 (12.23%) patients, and wound dehiscence in 14 (7.4%) patients.

The recurrence rates in the phenol and primary closure groups were 15 (8%) and 19 (10%), respectively ( $P=0.326$ ). Return to normal life was significantly faster in the phenol group ( $P<0.001$ ).

## Discussion

PDS is frequently observed in the sacrococcygeal region. Having a hairy body structure, excessive daily hair loss, deep and narrow gluteal cleft, the long stay of the hair in this cleft, humidity, weight, sitting for a long time and poor hygiene are predisposing factors for PDS [14]. There are many treatment methods for pilonidal sinus disease, which range from a minimally invasive method to complex flap reconstruction. In complex cases, open wounds left to secondary closure and flap methods are preferred. For patients with uncomplicated pilonidal sinus, crystallized phenol and primary closure methods can be used. Although there are not many comparative studies in the literature for these two methods, they are considered advantageous in terms of practicality, fast recovery times, and short operation times [15-17]. In our study, return to normal life was faster in the phenol group. This was thought to be due to the higher rate of wound infection, hematoma, and wound dehiscence in the primary closure group.

Some clinicians do not prefer the open method because of the high recurrence rates. Complications in PDS are important in determining the ideal treatment. However, primary excision and closure can be attempted, as it does not pose a challenge for flap reconstruction in case of reoperation in patients [15, 18]. Significant complications after the primary closure method are wound infection and wound dehiscence. Wound healing problems have been reported at a rate of 11-34% after the primary closure technique [18, 19]. In our study, this rate was 36.65%.

Local anesthesia was administered to all patients in our case series as described in the literature. Spinal anesthesia is required for other complex procedures. Spinal anesthesia is more invasive and expensive and can cause complications such as headache and urinary retention [12].

Different studies in the literature have shown the success rates of crystalline phenol treatment to range from 60% to 100%. [20]. It was discovered that the success rate rose as the phenol treatment was repeated. In the study of Attaallah et al.

[21], they showed that complete recovery rate after 16 months of follow-up increased to 76% when phenol was applied once and to 86% with multiple applications. Akan et al. [22] followed 42 patients who underwent phenol treatment once for 26 months and reported a success rate of 88%. This rate ranged between 70-77.7% in the studies of Kayaalp et al. [23] and Sakçak et al. [24]. In addition, as a result of a 54-month follow-up, Aygen et al. [25] found a recovery rate of 91.7% in the phenol treatment, which they applied an average of 3.7 times. In the study of Yuksel, the success rate after 40 months of follow-up was 88% [26]. In our study, the success rate of phenol treatment was 92% after 25 months of follow-up. In some circumstances, it appears that administering two or more phenol treatments is critical to the treatment's success.

In our study, wound site infection was observed in 3 (1.6%) cases. The reason for this is considered to be phenol leakage into the adjacent tissues and the obstruction of the sinus tract [27]. Wound site infection was seen in 69 (36.65%) patients in the surgery group. In terms of complications, the phenol group was superior to the open surgery group.

Even though the two techniques had resembling recurrence and complication rates in prospective randomized controlled research conducted by Sengul et al. [3], crystalline phenol treatment is advised due to advantages such as shorter procedural time and less analgesia requirement. In our study, the recurrence rates were similar, but the phenol group was superior to the surgical group in terms of complications.

## Limitations

The retrospective design of our study, short period of follow-up (25 months), and the inclusion of only primary cases can be considered limitations. However, the number of patients is higher than most studies in terms of decision making. It is important that similar techniques are used in a single center and by the same surgeons. Future studies with larger series and more homogeneously paired groups are needed.

## Conclusion

In our study, the recurrence rates of phenol treatment and excision/primary closure procedures in PDS were similar. However, phenol treatment has the advantage of low complication rates, easy application, and the advantage of being a minimally invasive method that provides an early return to normal life. In addition, both methods can be used in primary cases under local operating room conditions, since they do not affect subsequent surgical treatments. Although excision/primary repair is an easy-to-apply method under local anesthesia in pilonidal sinus patients, the superiority of phenol application was demonstrated in our study. Prospective randomized controlled studies are needed for more conclusive results.

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