Application of crystal-line phenol in pilonidal sinus disease

A single-center and single-surgeon experience.

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Application of crystal-line phenol in pilonidal sinus disease. A single-center and single- surgeon experience.

AIM: *Various surgical and minimally invasive treatment options are available in the treatment of pilonidal sinus. In our study, we aimed to retrospectively analyze the results of crystalline phenol application in patients who applied to our clinic with pilonidal sinus.*
MATERIAL AND METHOD: *Patients who were applied crystalline phenol due to pilonidal sinus disease between 2018-2019 were included in the study. The patients were evaluated in terms of demographic characteristics, pit count, surgical treatment history, abscess drainage history, number of repeated applications, complication status, recovery rate in the first month, success rate in the first year, and recurrence.*
RESULTS: *209 patients participated in our study. The average age of patients was 25.5, and the number of male patients was 4 times that of women. The patients had an average of 2.13 pits. Twenty-two patients had a history of abscess drainage. Thirteen patients had a history of surgical treatment. The recovery rate was 89.3% in the 1-month controls and 93.7% in the 1-year controls. Repeated application was performed to 11% of the patients. Seventeen patients had recurrence after wound healing. The most common complications were skin burn (1.4%) and wound infection (1.4%).*
CONCLUSION: *In the treatment of pilonidal sinus disease, crystalline phenol can be safely applied with a high success rate, low recurrence rate and an acceptable percentage of complications.*

KEY WORDS: Crystalline phenol application recurrence, Pilonidal sinus, Minimally invasive

Introduction

Pilonidal disease (PD) is a common disease that generally affects the young population and usually appears in the intergluteal region. Its incidence is 26/100,000 and is more common in men (1.3%) than women (0.11%) [1,2]. Its etiology is controversial, but it is generally considered an acquired condition.
Although many surgical and non-surgical methods have been proposed in the treatment of pilonidal disease, there is no clear consensus in the literature for the optimal treatment of pilonidal disease. Although there are many different opinions about the surgical treatment of pilonidal sinus disease in the literature, the common purpose is a simple and easily applicable treatment method, with a shorter hospital stay, less postoperative wound care and pain, and low recurrence rates and earlier return to daily activity.
The search for minimally invasive intervention in surgical treatments has also found its place in the treatment of pilonidal sinus [4,5].
Phenol (C_6H_6O) is an aromatic compound formed by bonding the hydroxyl group to the benzene ring and has acidic properties. It has antiseptic, anesthetic and strong sclerosing properties. It is white crystalline solid at room temperature; it can change to liquid form at higher temperatures [6,7]. In the treatment of pilonidal sinus disease, phenol can be used in liquid or crystalline forms. Phenol

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application has been defined as a conservative method in the treatment of pilonidal sinus and has been accepted as the first treatment option in some clinics. Although the success rate in the series in the literature varies between 64-95%, in many studies, more successful results were obtained in both the pediatric and adult groups compared to excision and flap repair [6,8,9]. In addition, the application of crystalline phenol for recurrence in patients undergoing repair with flap has yielded successful results [10,11].
In this study, we aimed to present the results of patients who were applied crystalline phenol due to pilonidal disease in our clinic.

Material - Method

Patients who were treated for pilonidal sinus disease in the Erciyes University proctology unit between 2018-2019 were included in our study. Patients who underwent flap repair and primary repair were excluded from the study. Patients who were applied crystalline phenol in our unit were followed up by filling in the follow-up forms in the proctology unit. Patients' information was evaluated retrospectively from this prospectively created database. The data of the patients with missing information were completed by phone calls. Patients treated with crystalline phenol were evaluated in terms of age, sex, pit number, pilonidal sinus type, history of surgical treatment, abscess drainage history, number of applications, complication status, recovery rate in the first month, and recurrence. The study was designed in conformity with the Declaration of Helsinki. There was no need for ethical approval because this is a retrospective study.
Tezel E. classification was used for the classification of pilonidal sinus [12] (Table I).
The healing criterion was evaluated as a complete closure of the wound, cessation of drainage from the wound, and disappearance of the pain with the disappearance of the induration.
After complete recovery, the re-emergence of complaints and the detection of sinus formation on physical examination were accepted as "recurrence".

Table I - *Classification of Pilonidal Sinus Disease.*

Type 1	Asymptomatic pit(s) without a history of abscess and/or drainage
Type 2	Acute pilonidal abscess
Type 3	Pit(s) with a history of abscess and/or previous drainage
Type 4	Extensive disease where 1 sinus opening lies outside the natal cleft area. Such patients usually have a history of multiple abscess formation and drainage without definitive pilonidal surgery
Type 5	Recurrent pilonidal sinus following any surgical treatment

All procedures were done by a single surgeon(EMS).
In the statistical analysis of the data, IBM SPSS Statistics for Windows, version 24 (IBM Corp., Armonk, N.Y., USA) package program was used. Categorical measurements were summarized as numbers and percentages, and continuous measurements as mean and standard deviation (median and minimum-maximum where necessary).

Crystalline Phenol Application Method

All patients were evaluated in the outpatient clinic before the procedure. Patients with abscess formation were treated with crystalline phenol after abscess drainage and antibiotherapy. They were asked to shave the treatment area the day before the procedure. Before applying lidocaine, nitrofurazone ointment and crystalline phenol, patients were questioned about their allergies and chemical sensitivity. Peripheral vascular access was established before the procedure. The patients were placed on the operating table in the prone position. The operation area was wiped with povidone iodine and covered in a sterile manner (Fig. 1). Local anesthesia was performed with 2% lidocaine (Fig. 2) . Sinus openings were widened in patients with small sinus openings using a mosquito clamp (BH-109 Aesculap, Aescuplap Werke AG, Tutlingen, Germany) (Fig. 3). The pits that were close to each other were combined. Hair inside the sinus was cleaned. The sinus tract was curetted through the use of a biopsy curette (ER015R Aesculap®, Aesculap Inc, Center Valley, USA) (Fig. 4). After the edge of the sinus orifice is protected with nitrofurantoin ointment (Furacin, Eczacibasi Ilaç San ve Tic AS, Istanbul, Turkey) (Fig. 5), crystalline phenol (Rasel Chemicals and Laboratory Materials Trade Co. Ltd. Kayseri, Turkey) is applied enough to fill the sinus cavity with the help of

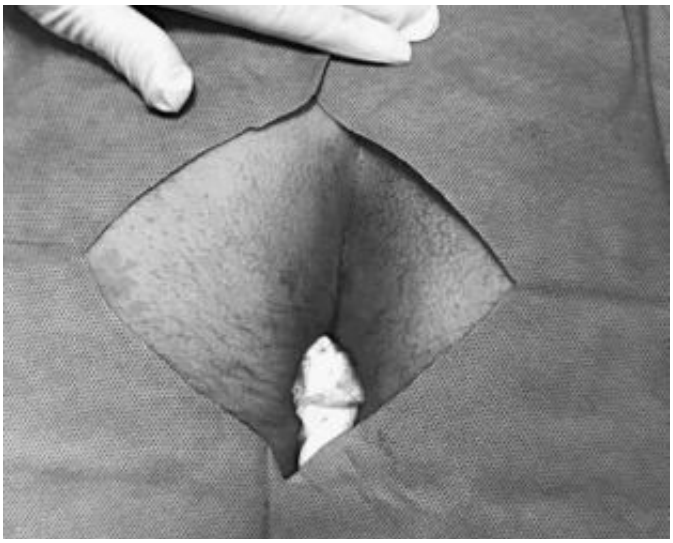

Fig. 1: The operation area was wiped with povidone iodine and covered in a sterile manner.

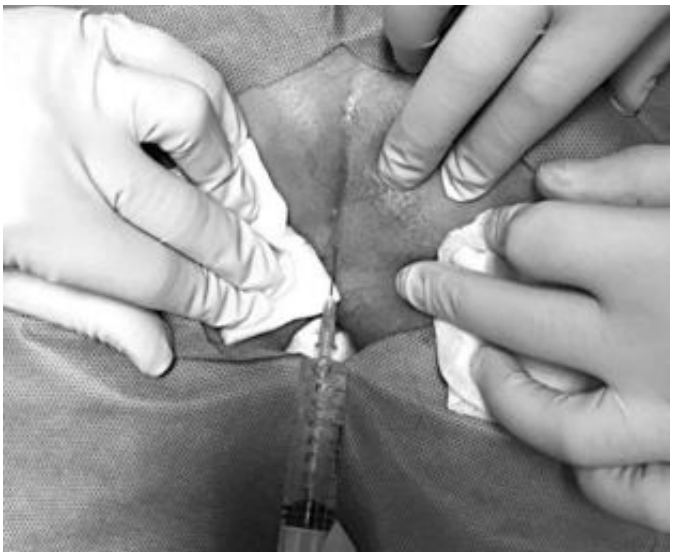

Fig. 2: Local anesthetic (2% lidocaine solution) is applied subcutaneously.

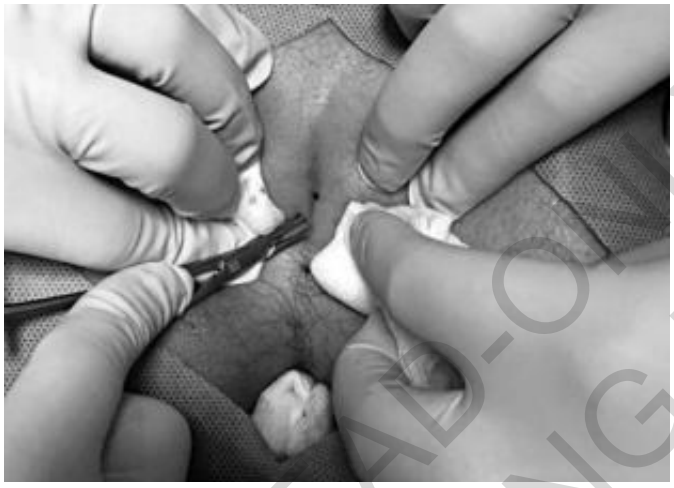

Fig. 3: Sinus openings were widened in patients with small sinus openings using a mosquito clamp.

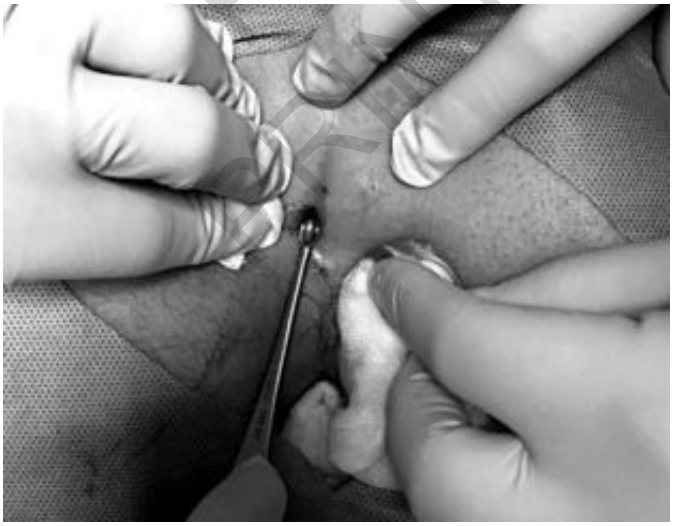

Fig. 4: The sinus tract was curetted through the use of a biopsy curette.

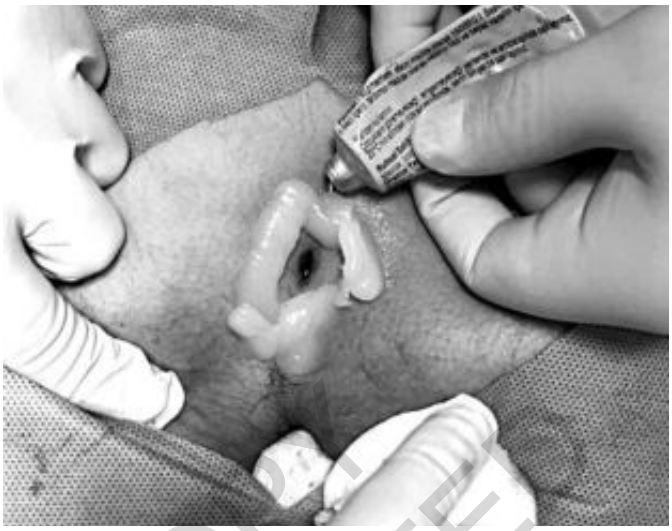

Fig. 5: After the edge of the sinus orifice is protected with nitrofurantoin ointment.

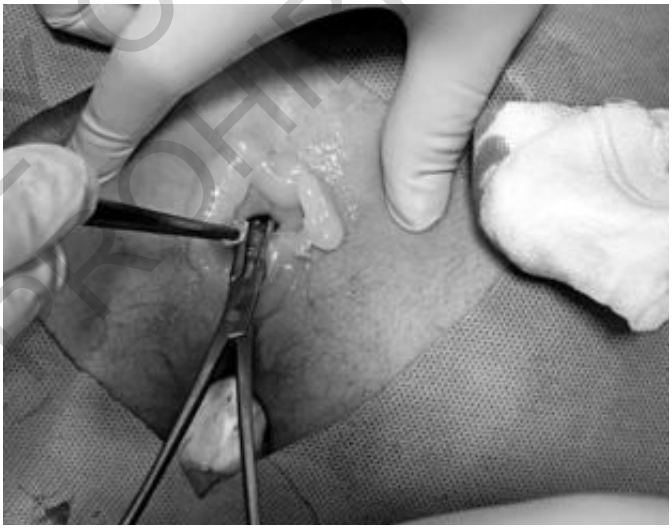

Fig. 6: Crystallized phenol is applied gently through the sinus opening.

a clamp (Fig. 6). Since the liquid phenol could leak into the anus, this area was covered with a gauze and protected. The process was terminated by applying dressing on the sinus. The patients were discharged on the same day. Twenty-four hours later and in the first week, they were called for control, and their dressings were applied, and the patients were called to the outpatient clinic for control of recovery in the first month.

Results

209 patients participated in our study. The average age of patients was 25.5, and the number of male patients was 4 times that of women. The patients had an aver-

TABLE II - *Demographic and Clinical Characteristics*

Variable		(n=209)
Mean age (years)	25.5+8.08 (12-61)	
Sex	Male	168 (%80.3)
	Female	41 (%19.7)
Pit Number		2.13+1.005 (1-5)
Type	1	102 (%48.8)
	2	57 (%27.2)
	3	30 (%14.3)
	4	15 (%7.2)
	5	5 (%2.4)
Abscess drainage history		22 (%10.5)
Surgical history	Excision, primary repair	9 (%4.3)
	Excision, flap repair	4(%1.91)

TABLE III - *Treatment outcomes*

Variable		(n=209)
Control (1-month)	Successful	187 (%89.3)
	No heal	22 (%10.7)
Control (1-year)	Successful	196 (%93.7)
	No heal	13 (%6,3)
Repeated application		23 (%11)
Recurrence		17 (%8.1)
Complication	Skin burn	3 (%1.4)
	Wound site infection	3 (%1.4)
	Hematoma	1 (%0.47)

age of 2.13 pits. The most common types were Type 1 (48.8%) and Type 2 (27.2%). Twenty-two patients had a history of abscess drainage. Thirteen patients had a history of surgical treatment. Details of demographic and clinical features are given in Table II.

The recovery rate was 89.3% in the 1-month controls and 93.7% in the 1-year controls. Repeated application was performed to 11% of the patients. Seventeen patients had recurrence after wound healing. The most common complications were skin burn (1.4%) and wound infection (1.4%). Treatment outcomes are shown in Table III.

Discussion

Pilonidal sinus disease is a subcutaneous lesion, usually filled with hair and debris, which mostly occurs in the sacrococcygeal region, and in different areas of the body, such as between the fingers or toes, and the navel [7].

Infected pilonidal disease affects about 0.7% of the population, the incidence is 25/100,000. It is two to four times more common in men than women, usually occurs between the ages of 15 and 30; the disease occurs very rarely before puberty or after the age of 60[13,14]. In accordance with the literature, the patients in our series were 80% male and the mean age was 25.

In the literature, many different flap techniques, minimally invasive interventions, laser therapy and crystalline phenol have been tried in the treatment of pilonidal sinus. Comparative series have varying results. Each technique has advantages and disadvantages compared to other techniques and minimally invasive approaches [14-20]. As a minimal approach, phenol treatment can be applied alone or it can be applied after primary excision [4].

If we look at the studies on the comparison of crystalline phenol with other that it can be safely applied in cases with recurrence after flap [10]. In the literature, crystalline phenol application has also been studied in the pediatric age group. U. Ates et al compared the crystalline phenol application with primary repair in the pediatric age group. In their study, they claimed that crystalline phenol application may be a minimally invasive alternative suitable for primary closure of PS with lower recurrence and complication rates in children (8 treatment methods, Akan et al. compared Limberg flap with crystalline phenol in their study. While infection, hematoma and wound degradation were significantly lower in the crystalline phenol group than the Limberg group ($p < 0.05$), no significant difference was found between the groups in terms of seroma ($p > 0.05$). In a twenty-six-month follow-up, recurrence was detected in four (8%) patients in the Limberg group and in six (12%) patients in the crystallized phenol group. There was no statistically significant difference between groups in terms of recurrence development ($p > 0.05$). Cosmetically, crystalline phenol group was evaluated as better ($p = 0.003$) [6]. When Akıcı, M et al. applied crystalline phenol in the recurrence group after Limberg flap, they found the success rate to be 90.7% and suggested).[8]

There are discussions about the definition of treatment success in the series in the literature. Some studies have considered results related to cessation of pain, bloating, or discharge symptoms to be successful. In these studies, asymptomatic small holes are not considered treatment failures. In some studies, successful treatment is considered as an anatomical improvement with full skin epithelialization, along with symptomatic relief. Different definitions cause variable results for treatment successes and recovery times [5]. According to the current literature, regardless of the characteristics of the patient, the overall success rate in pilonidal disease is reported to be 62-95% [9]. When we look at the literature, our series was one of the studies that were satisfying in terms of results. Our recovery rate in the first month was 89% and our rate in the first year was 93.7%. Repeated applications were made to patients who had failed treatment and those who had recurrences.

It is thought that the main reason for failure in phenol treatment depends on the remaining hairs in the sinus and the sinus walls that are not noticeable. Age, skin color characteristics, occupation of the patient or loca-

tion of the sinus holes were not significant in terms of recurrence. However, cases with many sinus tracts may not be suitable for this treatment. It has been argued that excluding complicated cases with many sinus tracts of will increase the success rate of phenol treatment [5,21,22]. In their study, Kaymakçıoğlu et al found the number of sinus orifices (> 3, 5.5% vs. <3, 37.5%) and the cavity volumes (> 12 ml, 5.6% vs. <12 ml, 71.4%) to be associated with recurrence [22]. The recurrence rate in the literature was found to be 0-13.9%, but the follow-up times were shorter in many series in the literature [9]. There are studies showing that 5 to 10 years of monitoring is the gold standard to evaluate the results [23,24]. Doll et al. argued in their series that 60% of relapses develop in the two-year follow-up period, therefore, long-term follow-up is required for the definitive detection of relapses [23].

Our recurrence rate was lower than the literature average. In our series,

application are reported to be approximately 0-15.2%, within acceptable limits [9,25]. The most common morbidity of phenol application is contact dermatitis and superficial cellulite. The exfoliation rate in the literature was found to the average number of pits was 2.03, and the most common was Type 1. We think that the low number of pits affected the recurrence rate in our series. In addition, our follow-up time ranged from 12 months to 24 months. This short follow-up period may also affect recurrence rates. 8.1% of patients developed recurrence. These patients were treated with repeated phenol applications and various flap methods.

In crystalline phenol application, minor complications compared to surgical methods and more tolerable complications for both patient and surgeon can be encountered. Although there are side effects of local anesthesia, there are also complications specific to crystalline phenol application. These are mostly local side effects. Complication rates of phenol be 8.3%. The rate of wound infection and hematoma at the wound site were reported to be 8% and 4%, respectively [26,27]. In our series, the complication rate was 3.27% and it was less than the literature, however our most common complications were related to the wound, similar to the literature.

One of the most important advantages of crystalline phenol application is that patients can return to routine life early and do not require hospitalization. Applications in our series were performed daily, no hospitalization was required.

The most important limitation of our study was its retrospective nature and short follow-up period. However, if we look at the number of cases, it was one of the large series of literature. In addition, performing all procedures by a single surgeon prevented heterogeneous results that may occur depending on the person who performed the procedure.

In conclusion, crystalline phenol application can be safely performed in the treatment of pilonidal sinus, with a high recovery rate and a low percentage of complications. We believe that recurrence rates may be reduced depending on patient selection and the experience of the practitioner of the treatment.

Riassunto

Sono disponibili varie opzioni per il trattamento chirurgico e mini-invasivo del seno pilonidale. Nel nostro studio, abbiamo analizzato retrospettivamente i risultati dell'applicazione del fenolo cristallino in pazienti con seno pilonidale che si sono rivolti alla nostra clinica tra il 2018 e il 2019. Tali pazienti sono stati valutati in termini di caratteristiche demografiche, numero di fistole, storia di trattamento chirurgico, storia di drenaggio di ascesso, numero di applicazioni ripetute, stato di complicanze, tasso di recupero nel primo mese, tasso di successo nel primo anno e recidiva.

I pazienti hanno partecipato al nostro studio sono 209, di età media di 25,5 anni e il numero di pazienti maschi quadruplo rispetto a quello delle donne. I pazienti presentavano una media di 2,13 fistole. Ventidue pazienti avevano una storia di pregresso drenaggio di ascesso. Tredici pazienti avevano una storia di precedente trattamento chirurgico. Il tasso di guarigione è stato dell'89,3% nei controlli a 1 mese e del 93,7% nei controlli a 1 anno. L'applicazione ripetuta è stata eseguita all'11% dei pazienti. Diciassette pazienti hanno avuto recidiva dopo la guarigione della ferita. Le complicanze più comuni sono state ustioni cutanee (1,4%) e infezione della ferita (1,4%).

Si conclude che per il trattamento del sinus pilonidalis, il fenolo cristallino può essere utilizzato in modo sicuro con un alto tasso di successo, un basso tasso di recidiva e una percentuale accettabile di complicanze.

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