ORIGINAL RESEARCH

DOI: 10.17944/interdiscip.1475704
Interdiscip Med J 2024;15(53):118-122

Use of crystallized phenol in pilonidal sinus in the pediatric age group: a 5-year single surgeon experience

Aybegüm Kalyoncu Ayçenk

Ordu University Faculty of Medicine Department of Pediatric Surgery, Ordu, Türkiye

Abstract

Objective: The Pilonidal Sinus (PS) is a pathology of the gluteal cleft that occurs with acute or chronic infection. This study aimed to report the evaluation of five-year experience with 50 patients' data outcomes of crystallized phenol in pilonidal sinus treatment (CP) pediatric age group.

Method: This retrospective study included 50 patients who underwent CP between 2017 and 2023 years. Patient demographics, operative data, follow-up findings, complications, and recurrence data were also evaluated.

Results: Fifty patients (female:31, male:19), mean of age 15,4 years. Hirsutism was diagnosed in 10 female patients (20%). Sixteen (32 %) patients had a family history of PS. Five patients had a smoking habit history (%10). The form of anesthesia was local anesthesia in eight patients (16%), sedation and local anesthesia in 27 patients (54%), and spinal anesthesia in 15 patients (30%). The average duration of the procedure was 13,8 min (10–22 minutes). The mean postoperative leakage time were 6,6 days. Complications were observed in five patients (10%). Recurrence was observed in three patients (6%). The overall cure rate is 94%.

Conclusion: The CP procedure should be used as the first choice, especially in adolescents, compared to the primary method in PS, such as total sinus excision, due to its minimally invasive, painless, low risk of recurrence, and very short postoperative recovery time.

Keywords: Pilonidal sinus, crystallized phenol, minimally invasive surgery, recurrence, complication

INTRODUCTION

Pilonidal sinus (PS) disease was firstly diagnosed by the finding of a characteristic epithelial tract situated in the skin of the natal cleft, a short distance behind the anus and generally containing hair by Hodges in 1880 (1). PS is an infectious and inflammatory disease frequently observed in young men. The disease is mostly seen in children who have hair on the gluteal sulcus, are obese, have poor hygiene, and spend most of their time sitting, like students (2). The incidence of PS is 0,26% (3). İn the pediatric age group incidence reported as 1,2-2/10,000 (4). The treatment of PS with primary and secondary flap methods is accompanied by local curettage, phenol application, electrocauterization, and total sinus excision. A treatment method with a shorter healing time, better cosmetic results, and lower recurrence rate has been discussed since the nineteenth century. In recent years, there has been a persistently high rate of recurrence and wound complications associated with PS, and there is still no universally agreed treatment. Crystallized phenol application is a minimally invasive treatment with no hospital stay and good cosmetic results (5).

In this study, we evaluated the minimally invasive treatment of PS with crystallized phenol in the pediatric population.

METHOD

This study included pediatric patients with PS who were treated with crystallized phenol. The patients' medical data were retrospectively analyzed. Written informed consent was obtained from the legal guardians of each child, and Ethical Committee Approval was obtained for the study (Ordu

Cite this article: Kalyoncu Ayçenk A. Use of crystallized phenol in pilonidal sinus, in the pediatric age group, 5-year single surgeon experience Interdiscip Med J. 2024;15(53):118-122. https://10.17944/interdiscip.1475704

Corresponding Author: Dr. Aybegüm Kalyoncu Ayçenk, Ordu University Faculty of Medicine Department of Pediatric Surgery, Ordu, Türkiye
E-Mail: aybegumkalyoncu@gmail.com
ORCID iD: https://orcid.org/0000-0002-9853-3803

Received: Apr 29, 2024
Accepted: Aug 25, 2024

University Clinical Research Ethical Committee -2021/78).

Patients data

Fifty patients diagnosed with pilonidal sinus disease between 2017 and 2023 were retrospectively reviewed. No patient was excluded from the study among the 50 patients followed up. The reviewed parameters included patients' demographic data, age, sex, presence of hirsutism in female patients, additional chronic diseases, family history, history of smoking, form of anesthesia, duration of the procedure, postoperative leakage duration, complications, and recurrence data (Table 1).

Table 1. Patients' demographics and results

Gender (n (%))	**Female**	31 (62%)
	Male	19 (38%)
Mean of age (years)		15,44
Hirsutism (n (%)) (Mean of Ferriman-Gallwey Score)		10 (20%), 16,7
Family history (n (%))		16 (32%)
Smoking habit (n (%))		5 (10%)
Form of anesthesia (n(%))	Only local anesthesia	8 (16%)
	Sedation and local anesthesia	27 (54%)
	Spinal anesthesia	5 (30%)
Average duration of the procedure (minutes)		13,8
Mean of postoperative leakage time (days)		6,6
Complication (n (%)		5 (10%)
Recurrence (n (%)		3 (6%)
Time of recurrence (months)		5,6

All patients were admitted to our clinic with a history of wound leakage, abscesses, and severe pain. Patients who had sinuses with purulent discharge and inflammatory signs or abscess formation were considered to have acute pilonidal disease. Active infections or abscesses were treated with antibiotics three weeks before the procedure. All procedures were performed by the same surgeon with the same technique. The anesthesia type (only local, sedation and local, spinal) of the procedure was argued and decided by the anesthesiologist and patient together.

Preparation and application of crystallized phenol

Regional hair cleaning was performed before the procedure as part of both preoperative preparation and treatment because of regional hair growth, which is the most important Reason for PS. Before the procedure, a single dose of prophylactic antibiotics was administered.

The patient was placed in a prone position and cleaned with an antiseptic solution. Subsequently, local/sedation/spinal anesthesia was initiated. Prior to the procedure, a local anesthetic (2% lidocaine solution) was injecte subcutaneously into the cavity. The sinus orifices were widened using a mosquito clamp (BH-109 Aesculap®, Aescuplap Werke AG, Tutlingen, Germany).

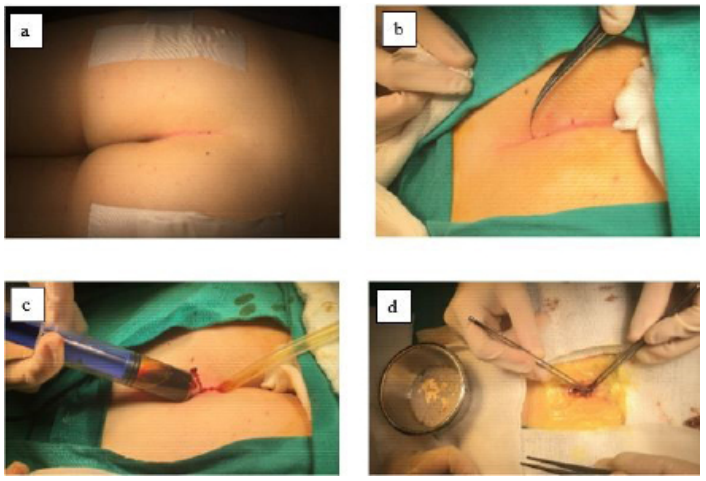

Figure 1. a, surgery field preparation, **b**, hair cleaning from inside the sinus. **c**, washing the sinus with povidone iodine. **d**, crystalline phenol application.

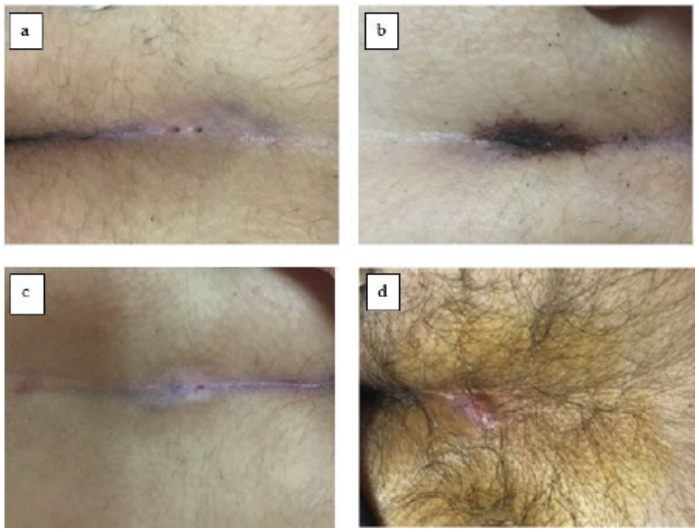

Fig.2. a, preoperative two fistula view. **b**, postoperative 1st day. **c**, postoperative 10th day. **d**, FG score-17, İdiopathic hirsutism patient.

If the sinus could not be dilated sufficiently, a vertical incision was made with clamp orientation. The hair materials in the cavity were cleaned with the help of the forceps and the sinus size was revealed. Povidone iodine and saline washes were performed using an anjiocath catheter. A barrier of skin was

formed with an oily pomade to prevent burns on the skin of the sinus circumference, and the anus was protected with sterile gauze.

Crystallized phenol (Phenol, Emprove®, Merck, Darmstadt, Germany) is a white crystalline solid substance that should be kept in glass bottles, and sunlight should be avoided. Owing to the serious properties of the substance, a face mask, eyeglasses, gloves, and a surgical gown with long sleeves should be worn during use. Crystallized phenol is solid at room temperature, but becomes liquid when applied to the skin.

Phenol was filled into the sinus with the help of Volkmann's spoon. During the procedure, liquid phenol flowing into the surrounding area was aspirated. Crystallized phenol reacts with the sinus and creates a blackish–dark brown color on the sinus surface. After the process, the area was closed with nitrofurantoin ointment (Furacin® Eczacıbası Ilaç San. ve Tic. A.S., Istanbul, Turkey) dressing. After the procedure, the patient was kept in a prone position for observation until oral feeding was initiated (Figure 1).

Preoperative and postoperative images of phenol applied patients were shown in Figure 2 and depicts a girl with hirsutism.

Postoperative follow-up and care

Oral intake was started one and half hours postoperatively. The need for analgesia was not observed, but anti-inflammatory use for one day was recommended for patients who underwent spinal anesthesia. The patient was discharged the same day. The dressing was removed on the first postoperative day. In the postoperative period, we recommended nitrofurantoin ointment twice a day and daily area cleaning with soap until the wound was dry.

Patients were evaluated on the first postoperative day, week, and month.

Statistical Analysis

SPSS® 10.05 for Windows (SPSS, Inc., Chicago, IL) computer program was used for statistical analysis, which was then evaluated by the descriptive statistics.

RESULTS

The average age of the 50 patients was 15.44 (10-17 years old). The female/male ratio of patients was 31/19. Ferriman-Gallwey (FG) score was measured in 10 (20%) female patients because of pathological hair growth, and further evaluation was performed to diagnose hirsutism. The mean FG score was 15.44. Three patients had polycystic ovary syndrome. In the operative evaluation, one fistula was observed in 37 patients, two was in 10 patients and three fistulas in 3 patients. One patient had a history of ureteropelvic junction obstruction and one patient had moderate mitral valve insufficiency. Sixteen patients (32%) had a positive family history of PS. Five patients had a smoking habit history (%10). The form of anesthesia was local anesthesia in eight patients (16%), sedation and local anesthesia in 27 patients (54%), and spinal anesthesia in 15 patients (30%). Average duration of the procedure was 13.8 min (10 to 22 min). Mean of postoperative leakage time was 6.6 days.

The patients were followed-up for an average of 13 months postoperatively. During the postoperative period, gluteal sulcus hair cleaning and the importance of personal hygiene were explained to the patients and their families.

Complications were observed in 5 patients. (10%). Three patients had prolonged leakage (2 weeks), which was diagnosed as a secondary infection and treated with oral antibiotics. Two patients had headaches secondary to spinal anesthesia. No recurrence was observed during the follow-up of these patients.

Recurrence was observed in 3 patients (6%). One male patient presented to the clinic three months postoperatively because of a sinus originating from a different location. This patient had a history of smoking. The patient was excluded from follow-up at his request. A female patient with hirsutism presented to the clinic with an abscess during the postoperative 1st year. The patient's hirsutism continued, and she did not undergo hair cleaning or laser hair removal. The patient was treated with antibiotic therapy, followed by drainage. After 3 weeks, the CP procedure was repeated. No recurrence was observed at postoperative 1-year follow-up. A male patient presented to the clinic with PS, which had the appearance of two fistulas. After the operation, protruding scar tissue developed at the orifice of one of the fistulas, and resistant leakage occurred. Two months after the operation, a secondary session was planned with excision of the scar tissue. No recurrence was observed in the postoperative 1-year follow-up. The overall cure rate was 94%.

DISCUSSION

As in the entire pediatric surgical approach, minimally invasive treatment protocols stand out in pilonidal sinus treatment. Pilonidal sinus surgery options have recently been used in pediatric surgeries, such as excision and primary closure, rhomboid excision and Limberg flap, marsupialization, and cleft lift procedures. Maurice and Greenwood first described local injection of liquid phenols in 1964 (6). This technics success rate was reported to be

between 59 and 93 percent (7, 8). The use of crystallized phenol was first published in the literature in 2004 by Dogru et al. (9), and its success rate was found to be much higher (95%) with crystallized phenol than with liquid injection. Reason why the crystallized phenol technique has been frequently preferred in recent years with no incision, no surgical procedure requiring suture, good pain control, easily accessible material, low cost, postoperative same-day return to active life, and recurrence rate is not different from open surgery.

Hirsutism is an important factor in the etiology of PS. Pilonidal disease often occurs after the onset of puberty when sex hormones stimulate pilosebaceous glands and body hair growth. Entrapped hair follicles become infected and require antibiotic treatment, with a recurrence rate of >30% (10). The American Society of Colon and Rectal Surgeons published in 2017 about pilonidal sinus in the literature; In order to prevent pilonidal diseases, it is recommended that hairs in the gluteal sulcus should be shaved or chemically depilated every 2-3 weeks until 30 years of age (11). In our study, 20% of the female patients were diagnosed with hirsutism. In the evaluation of this symptom, idiopathic results were determined and associated with ethnic and genetic factors. Gluteal sulcus hair removal was performed in 8 of the 10 patients with idiopathic hirsutism at the postoperative 3-year follow-up, and no recurrence was observed in any of these patients. Recurrence was observed in one patient because of not paying attention to hair cleaning and poor personal hygiene and was treated with the secondary CP method. No recurrence was observed during the 2-year follow-up. The recurrence rate was 10% in the patients diagnosed with idiopathic hirsutism.

It has been shown in the literature common PS risk factors such as gender, smoking, obesity, family history, excessive hairiness, diabetes mellitus, hair color, sweating, dermatological diseases and personal hygiene.

Family history was a risk factor for PS. Yildiz et al. published a risk factor for PS in teenagers, and 52% of the patients had a family history of PS disease (12). In our study, we found that family history posed a high risk (32%) of PS development.

In a study by Ates et al., excision, primary closure, and phenol application were compared. Complications (10.4% vs. 2.5%) and recurrence rates (13% vs. 2.5%) have also been reported (13). In Dogru et al.'s phenol application study of 41 patients, the recurrence rate was 17.1% (9). In our study, success and recurrence rates were 94% and 6 %, respectively. We would like to emphasize that the slightly higher complication rate in our study was due to the side effects of spinal anesthesia. As observed from the study data, we believe that spinal anesthesia is unnecessary in this group of patients. Additionally, in our study, a persistent discharge duration of longer than 2 weeks was considered a complication. However, in a similar series, this period was accepted as 30 days (14). Therefore, we believe that our complication rate is lower than that reported in the literature.

In this study, patients admitted to our clinic with PS were discharged on the same day. On the first postoperative day, the dressings were opened, and the patients were able to return to their active lives. We observed that patients who applied to our clinic with a diagnosis of PS preferred the CP procedure over other methods and were satisfied in the postoperative period.

Limitations of the study

The limitations of the study include the partially low number of patients and the fact that the study method was based on data from a single center and a single technique.

CONCLUSION

PS is frequently observed in adolescents. Although there are various treatment methods, a definitive treatment algorithm is not yet available. We believe that the crystallized phenol method should be used as the first choice, especially in adolescents, compared to primary methods such as total sinus excision because of its minimal invasiveness, painlessness, low risk of recurrence, and short postoperative recovery time.

ACKNOWLEDGEMENT

Peer-Review

Both externally and internally peer reviewed.

Conflict of Interest

The authors declare that they have no conflict of interests regarding content of this article.

Financial Support

The Authors report no financial support regarding content of this article.

Ethical Declaration

Ethical permission was obtained from the Ordu University Clinical Research Ethics Committee for this study with date April 4, 2021 and number 78, and Helsinki Declaration rules were followed to conduct this study.

REFERENCES

1. Hodges RM. Pilonidal sinus. Boston Med Surg J. 1880;

103: 485-586.

2. Tezel E., Bostancı H., Azılı C., Kurukahvecioğlu O., Anadol Z. A new perspective for pilonidal sinüs disease and its treatment. Marmara Medical Journal. 2009;22:85-9.
3. Sondenaa K, Andersen E, Nesvik I, Soreide JA. Patient characteristics and symptoms in chronic pilonidal sinus disease. Int J Colorectal Dis. 1995;10(1):39-42.
4. Nasr A, Ein SH. A pediatric surgeon's 35-year experience with pilonidal disease in a Canadian children's hospital. Can J Surg. 2011;54(1):39-42. doi: 10.1503/cjs.028509.
5. Akan K, Tihan D, Duman U, Özgün Y, Erol F, Polat M. Comparison of surgical Limberg flap technique and crystallized phenol application in the treatment of pilonidal sinus disease: a retrospective study. Ulus Cerrahi Derg. 2013;29(4):1626. doi:10.5152/UCD.2013.2457.
6. Maurice BA, Greenwood RK. A conservative treatment of pilonidal sinus. Br J Surg 1964;51:510-2. doi: 10.1002/bjs.1800510711.
7. Doll D, Orlik A, Maier K, Kauf P, Schmid M, Diekmann M, Vogt AP, Stauffer VK, Luedi MM. Impact of geography and surgical approach on recurrence in global pilonidal sinus disease. Sci Rep. 2019;22;9(1):15111. doi: 10.1038/s41598-019-51159-z.
8. Stauffer VK, Luedi MM, Kauf P, Schmid M, Diekmann M, Wieferich K, Schnüriger B, Doll D. Common surgical procedures in pilonidal sinus disease: A meta-analysis, merged data analysis, and comprehensive study on recurrence. Sci Rep. 2018;15;8(1):3058. doi: 10.1038/s41598-018-20143-4.
9. Dogru O, Camci C, Aygen E, Girgin M, Topuz O. Pilonidal sinus treated with crystallized phenol: an eight-year experience. Dis Colon Rectum. 2004;47(11):1934-8. doi: 10.1007/s10350-004-0720-y.
10. Fahrni GT, Vuille-Dit-Bille RN, Leu S, et al. Five-year follow-up and recurrence rates following surgery for acute and chronic pilonidal disease: A survey of 421 cases. Wounds. 2016;28:20-6.
11. American Society of Colorectal Surgeons. Pilonidal disease. Available from: https://www.fascrs.org/patients/diseasecondition/pilonidaldisease.
12. Yildiz T, Elmas B, Yucak A, Turgut HT, Ilce Z. Risk Factors for Pilonidal Sinus Disease in Teenagers. Indian J Pediatr. 2017;84(2):134-8. doi:10.1007/s12098-016-2180-5.
13. Ates U, Ergun E, Gollu G, et al. Pilonidal sinus disease surgery in children: the first study to compare crystallized phenol application to primary excision and closure. J Pediatr Surg 2017;53(3):452-5.
14. Yuksel ME. Pilonidal sinus disease can be treated with crystallized phenol using a simple three-step technique. Acta Dermatovenerol Alp Pannonica Adriat. 2017;26:15-7.