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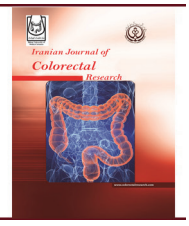

Pilonidal Disease Treatment with Pit Excision and Silver Nitrate (A Retrospective Study)

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Abstract

Introduction: Minimally invasive treatment approaches for pilonidal disease comprise controlling tissue damage of the sinus cavity via chemical agents or lasers. Although silver is a widely used chemical for healing wounds, there are limited studies about pilonidal disease management. We aimed to evaluate the efficacy of silver nitrate on pilonidal disease.
Methods: Patients who were diagnosed with pilonidal disease and were treated with silver nitrate application in Malatya, Turkey in 2018-2020 were evaluated. Silver nitrate was applied in the sinus tract following the excision of the sinus orifice with a small incision and debridement of the sinus cavity. Silver nitrate sticks were used to obtain controlled damage in the tissue of the sinus cavity for three sessions at baseline and on days one and seven. The obtained results were evaluated with the Mann Whitney U and chi-square tests.
Results: 42 patients with the pilonidal disease were included in this study, and silver nitrate treatment was applied in our institute. The median age of the patients was 24 (range: 16-56) years, and all of the treatment procedures were applied in the operating room. Thirthy-three of the patients (78.6%) were accepted as treated at the end of the 12-month follow-up duration.
Conclusion: Silver nitrate treatment is a simple, safe, and inexpensive minimally invasive treatment technique for pilonidal disease. This treatment can be an alternative treatment choice to other minimally invasive techniques. It is easy to perform in outpatient clinics, and the results of this study might be promising.
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Keywords: Pilonidal sinus, Silver nitrate, Phenol

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Introduction

Pilonidal disease (PD) can be described as a recurrent inflammatory process secondary to hair penetrating under the skin and accumulating in a cavity in the intergluteal cleft. PD is a benign subcutaneous pathology that occurs particularly in young men and may cause abscess formation or chronic infection (1, 2). Its treatment is still controversial, and a gold standard treatment should provide less hospital stay, minimal inconvenience, short time off work, and be cost-effective. All excisional surgical procedures, whether they close the cavity or leave it open, have a higher risk of

wound infection and a prolonged wound healing process (3-5). Thus, minimally invasive treatment modalities such as phenol or sealant have recently become more common (6, 7). Fibrin sealant was found to be effective in treating PD; however, it was not advisable because of its non-superiority to other cost-effective minimally invasive methods (7). Phenol was found to be a simple and inexpensive method that can be readily applied on an outpatient basis, decreasing both the recurrence and absence from work (6). However, phenol use is prohibited in some countries, such as Germany, Switzerland, and Austria (8). Phenol application can sometimes become difficult and risky for the healthcare provider (9). Therefore, searching for a good alternative phenol seems rational and useful.

Silver has widespread use in chronic wounds where infection control is difficult, such as burns and decubitus wounds (10). Studies about silver nitrate (SN) in PD treatment are limited. Therefore, there is not yet a standard treatment guideline for application. We aimed to evaluate the therapeutic effectiveness of SN in patients with PD.

Patients and Methods

53 patients were diagnosed with sacrococcygeal PD between December 2018 and May 2020 in the Malatya Inonu University Medical Faculty General Surgery outpatient clinic. Five patients were excluded because of surgical excision and six due to phenol application. Ultimately, 42 patients were enrolled in this study. Each patient was informed in detail about the procedure and the recovery process and informed consent was obtained. Demographic data such as age, sex, body mass index (BMI) (kg/m^2), profession, comorbidities, number of pits, number of applied SN sticks, duration of SN stick application, whole procedure time, postprocedural pain and analgesic usage, follow-up duration, wound healing status, and complications were recorded. The follow-up duration was planned as 12 months for all patietns at the begining of the study.

Procedure

This procedure was performed in the lights of the previously performed treatment approaches for PD (10, 11). The procedure was performed in the prone position. No preprocedural preparation was performed. Antibiotic prophylaxis was not performed. PD area was shaved and cleaned with an antiseptic solution before the application. Local anesthesia was performed using Lidocaine HCL and NaHCO3 to reduce the pain of injection by neutralizing the acidity. SN was applied in three sessions. In the first session, the procedural steps were as follows: pit and external sinus orifice excision (by performing a 2- or 3-mm diameter circled incision with a number 11 scalpel), hair removal away from the sinus cavity if present with a sterile clamp, irrigation of the sinus tract (with normal saline and nothing was used for skin protection). Electrocautery was used for minimal bleeding. SN application was performed via SN sticks with 3 sticks for each pit. Each stick was applied for ten seconds. Then, the gauze was placed over the orifice. The sinus cavity was debrided properly for better results like previously was described (12, 13). Patients were asked to refrain from bathing for 24 hours. The second and third sessions were applied on the 1st and 7th days after the first session. In the second and third sessions, the gauze was removed, debridement or hair removal was performed if any necrotic tissue was observed or any hair had remained, and SN sticks were applied without local anesthesia (it was not used routinely but selectively if needed during the procedure). In the last session, the patients were told to remove the gauze 24 hours after application, and the orifice was left for secondary healing.

The patients were asked to fill out a questionnaire about pain status and analgesic usage after each session. After three sessions of SN applications, the closure of the external sinus orifice in the first month and the resolution of symptoms (pain, discharge, contamination) were accepted as "the cure". Persisting or unclosed external sinus orifices without any symptoms were accepted as "asymptomatic pilonidal disease". Persisting or unclosed external sinus orifice, with discharge or hair accumulation or inflammatory reactions, was accepted as "unhealing". Patients were called for a control examination in the first, sixth, and twelfth months beginning from the first session. To observe the efficacy of the treatment, the rate of recurrence, and the complications after treatment were planned by the control examination and the record of patients' complaints in those periods in the 6th and 12th months. However, the patient follow–ups were not regular and we did not reach most patients. Therefore, the follow–up patients' information is missing. So we accepted the follow–up duration as 1 month.

Statistical Analysis: We used the Shapiro-Wilk test to assess the normality of the distribution of continuous variables. Continuous variables were reported as median (range) and were compared with the MannWhitney U test. Categorical data were reported as frequencies (percentages) and were compared with the chi-square test, or the Fisher exact test, as appropriate. Analyses were conducted using SPSS version 17 for Windows (SPSS Inc., Chicago, Illinois, USA) with $P<0.05$ considered significant.

Results

The median age of the study group was 24 (range:16-56) years, and 81% (n=34) of them were men. The median BMI was 26.4 (20.5–40.9) kg/m^2. The median pit number was 2 (1-18) in cured patients, but it was 4 (2-18) in nonhealing patients (Table 1). Five (12%) of the patients had at least one comorbidity

(one diabetes mellitus, one asthma, one brucellosis, one scoliosis, and one lumbar disk herniation). The median number of applied SN sticks was 3 (range: 1–6). The median duration of SN stick application was 10.6 (10-30) seconds, and the median whole procedure time at the first session was 20 (range: 10-35) minutes. 31 (73%) patients needed analgesics on postoperative day one, compared with 27 (64%) on day two and 20 (47%) on postoperative day three. Local anesthesia was needed in 10 (23%) patients during the second or third sessions. Postoperative complications were observed in seven (16.7%) patients. Hypotension and presyncope occurred in four (9.5%) patients early after the procedure, and bleeding occurred in three (11%) patients on the third postoperative day. All of them were managed conservatively. At the end of the first months, 31 (73.8%) patients were accepted as "cured" as they symptomatically healed without a remaining orifice. Two (4.4%) patients were asymptomatic despite the remaining sinus orifices (asymptomatic PD). In total, 33 (78.6%) patients were asymptomatic and 9 (21.4%) were not healed (Table 1).

Discussion

The result of this study evaluated that over %75 of the patients were healed symtomatically with the treatment of silver nitrate application. PD was first described in a young woman by Herbert Mayo in 1833 (12, 14). Although PD is commonly diagnosed in the sacrococcygeal region, it can also occur in other parts of the body, such as the umbilicus, forehead, scalp, clitoris, interdigital area, penis, abdomen, neck, and axilla (15). Previously, it was thought that PD was a congenital disease. Although the pathophysiology of PD has not yet been identified, it is currently considered an acquired disease (12, 16, 17). PD is thought to originate from a granulomatous reaction caused by hair penetrating the subcutaneous tissue (10, 15, 18). According to Karydakis procedure, three major factors contribute to the penetration of hair into subcutaneous tissue: (i) the substance that penetrates, which consists of loose hair; (ii) a certain force that causes the penetration of hair; and (iii) the susceptibility of the skin in a specific area (13). The etiological factors of PD can be listed as deep natal cleft, prolonged sitting (including traveling or driving), excessive body hair, poor local hygiene, and obesity (10, 18, 19).

There are several treatment methods for PD, but there is not a single definitive treatment modality (20). Each treatment modality has its advantages and disadvantages. The gold standard treatment method should provide less pain, a shorter hospital stay, low complication and recurrence rates, and a quicker return to daily life (10, 21). Surgical techniques involve skin closure after surgical resection of the sinus cavity from the presacral fascia layer. Various techniques have been performed for skin closure, including Z-plasty, W-plasty, V-Y plasty, the Karydakis technique, the Bascom flap, the Limberg flap, and marsupialization. These surgical techniques are often associated with increased morbidity, high recurrence rates, and long hospital stays (16, 19). In addition, tissue loss after these surgical interventions complicates the management of recurrent disease (20).

Excision of the sinus cavity and associated tracts followed by primary closure or secondary wound healing is the most preferred method for surgical treatment. Surgical procedures require general anesthesia and hospital stay as a disadvantage (22). In addition to classical surgical techniques, minimally invasive techniques such as sinotomy, sinusectomy, laser cauterization, fibrin sealant, and endoscopic video-assisted treatments are currently performed as the primary treatment options (7, 16, 23).

Phenol treatment, the injection of 80% phenol into the sinus tract, was described by Maurice and Greenwood in 1964 and is the most performed local treatment option (24). Controlled chemical destruction of the sinus epithelium is aimed via phenol injection. SN usage is another chemical cauterization technique with the same treatment principles as phenol injection. SN causes destruction, stimulates fibrosis, and closes the sinus tract via granulation with no need for excision. It also reduces the microbial burden inside the tract through its antimicrobial effect. SN has no proven, serious, permanent side effects. While silver metal combinations are toxic to pathogens, their toxicity

Table 1: Comparison of demographic variables according to patient groups

Variable	All patients (n=42)	Symptomatic healing (n=33)	Unhealing (n=9)	P value
Sex, n (%)				>0.99*
Women	9 (21.43)	7 (21.21)	2 (22.22)	
Men	33 (78.57)	26 (78.79)	7 (77.78)	
Age (year), median (range)	24 (16-56)	23.5 (16-56)	22 (19-40)	0.99§
Body mass index (kg/m^2), median (range)	26.4 (20.5-40.9)	26.2 (20.5-40.9)	26.6 (21-31.3)	0.31§
Number of pits, median (range)	2 (1-18)	4 (1-7)	4 (2-18)	0.003§
Hair presence in the pit (n)	29	21 (63.00)	8 (88.00)	0.23*
Duration of procedure, minute median (range)	20 (10-35)	20 (10-30)	20 (10-35)	0.16§
Irrigation with isotonic fluid (n)	16	12 (36.00)	4 (44.00)	0.71*
Too much hair (n)	21	19 (57.00)	2 (22.00)	0.13*

Data were analysed using Fisher exact test (*) or MannWhitney U test (§). P-value < 0.05 considered significant.

is lower in healthy tissues (11, 24).

Sözen (15) and Kurt (25) and their co-workers showed that treatment with SN application was effective on umbilical PD. Kanat and colleagues (10) reported a study with a single-session application of SN in 45 patients. In this study, monthly follow-up of patients was performed, and if any orifices were observed during the follow-up, the application was repeated. Complete wound healing with no discharge and no pain at the end of 12 months was considered a cure. The results showed a success rate of over 90% in a median 29-month follow-up. Another study (11) compared the results of phenol application (50 patients) and SN application (40 patients). Similar to another study (10), in the SN group, a single session SN application was performed for each patient, monthly routine follow-up was performed, and the cure was described as complete wound healing with no discharge, pain, or complaints at the end of the 12-month follow-up. The success rate of the SN application was 95%, which was the same as that of the phenol application.

In our study, we performed SN application in three sessions, different from the literature, and the number of patients was parallel to the literature. While the duration of SN stick application was not specified by the mentioned study (10), Kocamaz and colleagues (11) reported this as one to two minutes. This was approximately 10 seconds in our study. Postprocedural pain status and analgesic usage were not mentioned in other studies. The reason for the high analgesic usage rates in our study was the shorter SN stick application time on tissue or the lack of local anesthesia usage at the second and third sessions.

The importance of orifice dilatation or the excision of the pit was emphasized and recommended to clean the hair in the sinus and to perform the treatment without damaging the skin around the orifice in some other chemical cauterization studies (22, 26). without any preoperative testing, colon cleansing, prophylactic antibiotics or sedation. A pit excision (mean length 1.3±0.5 cm Hair removal is a common point of all PD treatment options, and it is important for preventing recurrence. This can be done with creams, waxing, epilators, shaving, and laser depilation (22).

The limitations of this study were the limited number of patients short follow-up, and not having a control group.

Conclusion

SN stick application with a minimally invasive technique is simple and has similar results to other nonsurgical treatment options. SN application can be an alternative treatment choice for PD owing to the advantages of acceptable wound healing, quicker return to work, and fast and easily applicable. In addition, this cheap and simple treatment method can be easily performed in outpatient clinics without the need for preoperative preparation and a long postoperative recovery period, as in complex surgical interventions. Although the success rate is not satisfactory enough, we consider this treatment can be performed for most cases. We recommend SN application as an alternative treatment method for patients with PD who expect less postoperative pain, a shorter return to work, and acceptable wound healing. However, further research with larger populations and longer follow-ups is required to determine this as a standard treatment.

Ethics Approval

We have received the ethics committee approval for this retrospective study from the Inonu University Ethics Committee with the 2019/37 protocol code.

Conflict of interest: None declared.

References

1. Bolandparvaz S, Moghadam Dizaj P, Salahi R, Paydar S, Bananzadeh M, Abbasi HR, et al. Evaluation of the risk factors of pilonidal sinus: A single-center experience. Turk J Gastroenterol. 2012;23:535–7.
2. Akinci ÖF, Bozer M, Uzunköy A, Düzgün ŞA, Coşkun A. Incidence and Aetiological Factors in Pilonidal Sinus Among Turkish Soldiers. Eur J Surg. 1999;165:339–42.
3. Füzün M, Bakir H, Soylu M, Tansug T, Kaymak E, Harmancioglu Ö. Which technique for treatment of pilonidal sinus—Open or closed? Dis Colon Rectum. 1994;37:1148–50.
4. Dağlar G, Yüksek NY, Gözalan U, Murat A, Kama NA. Comparison of Primary Closure and Rhomboid Flap Transposition Techniques in the Treatment of Pilonidal Sinus Disease. Turk J Surg. 2004;20:127–31.
5. Kayaoğlu HA, Özkan N, Ersoy ÖF, Çelik A. The effect of hydrogel use on wound healing in pilonidal sinus patients undergoing surgical therapy by lay open technique. Turk J Surg. 2006;1:26–9.
6. Dogru O, Camci C, Aygen E, Girgin M, Topuz Ö. Pilonidal Sinus Treated With Crystallized Phenol: Dis Colon Rectum. 2004;47:1934–8.
7. Kayaalp C, Ertugrul I, Tolan K, Sumer F. Fibrin sealant use in pilonidal sinus: Systematic review. World J Gastrointest Surg. 2016;8:266.
8. Yuksel ME. Comparision of American, German and Italian guidelines for the treatment of pilonidal disease with phenol. Tech Coloproctology. 2020;24:91–2.
9. Kayaalp C, Tolan K. Crystallized or Liquid Phenol Application in Pilonidal Sinus Treatment. Indian J Surg. 2015;77:562–3.
10. Kanat BH, Yazar FM, Kutluer N, Solmaz ÖA, Bozan MB, Çay F, et al. Use of silver nitrate application as mini-invasive treatment of pilonidal sinus disease. Chir [Internet]. 2021 [cited 2022 Dec 10];115(6):775–82.
11. Kocamaz AH. Pilonidal sinüs hastalığının tedavisinde kristalize fenol ve gümüş nitrat uygulamasının karşılaştırılması. 2021 [cited 2022 Dec 10].
12. Girgin M, Kanat BH. The Results

of a One-Time Crystallized Phenol Application for Pilonidal Sinus Disease. Indian J Surg [Internet]. 2014 Feb 1 [cited 2022 Dec 10];76(1):17.
13. Emiroğlu M, Karaali C, Esin H, Akpinar G, Aydin C. Treatment of pilonidal disease by phenol application. Turkish J Surg [Internet]. 2017 [cited 2022 Dec 10];33(1):5.1.
14. Kalaiselvan R, Bathla S, Allen W, Liyanage A, Rajaganeshan R. Minimally invasive techniques in the management of pilonidal disease. Int J Colorectal Dis [Internet]. 2019 Apr 1 [cited 2022 Dec 10];34(4):561–8.
15. Sözen S, Kanat BH, Kanat Z, Namık IB, Üniversitesi K. Effective conservative treatment of umbilical pilonidal sinus disease: Silver nitrate? Salt? Breast View project Grynfelt Hernia Presenting with Left Side Pain: An Unusual Case View project. [cited 2022 Dec 10].
16. Pappas AF, Christodoulou DK. A new minimally invasive treatment of pilonidal sinus disease with the use of a diode laser: a prospective large series of patients. Color Dis [Internet]. 2018 Aug 1 [cited 2022 Dec 10];20(8):O207–14.
17. Mayo H. Observations on injuries and diseases of the rectum. Burgess Hill. 1833.
18. Metzger GA, Apfeld JC, Nishimura L, Beyene TJ, Lutz C, Deans KJ, et al. Room for Improvement: The Trephination Procedure for Pediatric Patients with Pilonidal Disease. J Surg Res. 2021 Nov 1;267:605–11.
19. Piskin T, Olmez A, Mecit EA, Unal B, Aydin C, Kayaalp C. Orifice Location Guided Excision and Flap Procedures for Treatment of Sacrococcygeal Pilonidal Disease. Adv Clin Exp Med [Internet]. 2011 [cited 2022 Dec 10];20(4):481–8.
20. Topuz Ö, Sözen S, Tükenmez M, Topuz S, Vurdem ÜE. Crystallized Phenol Treatment of Pilonidal Disease Improves Quality of Life. Indian J Surg [Internet]. 2014 Feb 1 [cited 2022 Dec 10];76(1):81.
21. Kayaalp C, Olmez A, Aydin C, Piskin T, Kahraman L. Investigation of a one-time phenol application for pilonidal disease. Med Princ Pract [Internet]. 2010 Mar [cited 2022 Dec 10];19(3):212–5.
22. Olmez A, Kayaalp C, Aydin C. Treatment of pilonidal disease by combination of pit excision and phenol application. Tech Coloproctol [Internet]. 2013 Apr 1 [cited 2023 Jan 8];17(2):201–6.
23. Velotti N, Manigrasso M, Di Lauro K, Araimo E, Calculli F, Vertaldi S, et al. Minimally invasive pilonidal sinus treatment: A narrative review. Open Med [Internet]. 2019 Jan 1 [cited 2022 Dec 10];14(1):532–6.
24. Girgin M, Kanat BH, Ayten R, Cetinkaya Z, Kanat Z, Bozdağ A, et al. Minimally Invasive Treatment of Pilonidal Disease: Crystallized Phenol and Laser Depilation. Int Surg [Internet]. 2012 Dec 1 [cited 2022 Dec 10];97(4):288–92.
25. Kurt F. Efficacy of silverdin nitrate in patients with umbilical pilonidal sinus: a retrospective clinical study. Esperienze Dermatologiche [Internet]. 2021 Jul 13 [cited 2022 Dec 26];21(2–4).
26. Emiroğlu M, Karaali C, Esin H, Akpinar G, Aydin C. Treatment of pilonidal disease by phenol application. Turkish J Surg [Internet]. 2017 [cited 2022 Dec 10];33(1):5.1.