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Comparison of Crystallized Phenol Treatment and Simple Primary Closure Methods for Pilonidal Sinus Disease

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The objective of the study was to compare the results of the patients treated with crystallized phenol treatment (CPT) or simple primary closure (SPC) for pilonidal sinus disease (PSD). For PSD treatment, both SPC and CPT have the advantages of rapid recovery, minimal pain, and short hospital stay. Even though these two techniques can be used interchangeably in uncomplicated cases, there is not enough evidence about which method is superior. A total of 102 patients who underwent CPT (n = 57) and SPC (n = 45) for uncomplicated PSD were included in the study. In all of the cases, data were recorded and compared between CPT and SPC groups, including age, gender, duration of the symptoms, hospital stay, complications, healing time, and recurrence. The mean age was 25.6 years and the male-to-female ratio was 93:9. The SPC and CPT groups were similar in terms of age, gender, duration of symptoms, complications, and healing time. The CPT group did not require hospitalization or anesthetic procedure in addition to local anesthesia, but the SPC group required a median of 1 day (range, 1–3 days) of hospitalization, and 3 patients (6.7%) needed spinal anesthesia. During a median of 27.5 months' follow-up, the recurrence rate in the CPT group (6 patients; 10.5%) was lower than in the SPC group (13 patients; 28.9%). Both hospital stay and recurrence rates were better in the CPT group. Healing time and complication rates were similar in both methods. Based on these results, we suggest that CPT should be preferred to SPC in uncomplicated cases.

Key words: Pilonidal sinus disease – Surgery – Crystal phenol – Simple primary closure

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Pilonidal sinus disease (PSD) is a common intergluteal region disease with no established standard method of treatment.[1] The ideal surgical treatment of PSD should be simple and easily applicable, with a short hospitalization requirement, fewer wound problems, low pain, low recurrence rate, and less time away from daily activities.[2,3] Several treatments procedures have been used for years, and their advantages and disadvantages have been discussed.[4]

In deciding the best operation technique, it is important to determine whether the case is uncomplicated or complicated. The frequently used techniques, such as flap reconstruction procedures and open wound management, in complicated cases have been debated as overtreatment for uncomplicated cases.[5] As in all fields of surgery, minimally invasive surgery methods have always been attractive for surgeons. However, minimally invasive methods often remain limited to uncomplicated cases. Crystallized phenol treatment (CPT) is one of the minimally invasive methods for the treatment of PSD. Although it has also been used for recurrent and complicated diseases, it is quite effective in uncomplicated cases.[6] CPT is simple and cost-effective, with a rapid return to work and a lack of hospital stay, and it has an acceptable recurrence rate.[7,8]

Simple primary closure (SPC) is another frequently preferred method for uncomplicated cases.[4] It has advantages similar to CPT. However, it may limit the postoperational activity of the patient because of tissue tension, and it may delay a return to daily routine. Moreover, PSD may reoccur because the depth of intergluteal sulcus may not be filled, and epulosis tissue may develop in the cleft.[1,9,10]

Although studies are focused on less invasive methods, such as CPT and SPC, and there are a sufficient number of studies comparing CPT and SPC with extensive techniques, we did not see any study designed to compare CPT with SPC. In this study, we compared the results of the patients who were treated with CPT or SPC for uncomplicated PSD.

Patients and Methods

Patients who received a diagnosis of PSD between June 2011 and September 2013 and treated with either SPC or CPT were examined retrospectively. Complicated cases were excluded from the study. Complicated pilonidal sinus was defined as chronic unhealed wounds, cases combined with abscess, recurrent cases, and multiple pits in the large area that make simple excision impossible. The following parameters were recorded for all cases: age, gender, duration of symptoms, length of hospital stay, postoperative complications (wound infection, seroma, hematoma, and skin abrasion), healing time of the wound, and recurrence.

Surgical procedure

Simple primary closure

The patients were placed in the jackknife position, and the area to be excised was marked on the skin. A rhomboid incision to the presacral fascia including the sinus and its extensions was made longitudinally from the superior to the inferior. A closed-suction drain was then placed in some patients. The skin edges were approximated without tension using interrupted sutures of nonabsorbable 3/0 suture.

Crystal phenol treatment

Local anesthesia was applied in all cases. The pit was widened via clamp, and the hair and debris were cleared after PNS was confirmed as uncomplicated through direct observation. The epithelial cyst was curated, and the crystal phenol was filled into the sinus with the help of a clamp after the pit edges were treated via nitrofurazone pomade (Fig. 1). The surgery was completed with the dressing of the wound. Patients were invited for control examination within 2 weeks. During control examination, all completely closed sinuses were considered healed and these patients were invited for control within 1 month. Sinuses that had not closed during control examination were treated again with the same CPT.

Statistical analysis

Statistical evaluation of data was performed using MedCalc software (licensed to MedCalc, Ostend, Belgium). Data were presented as mean ± SD, median (range), or n (100%). Continuous variables were evaluated by Student *t*-test or Mann-Whitney *U* test after checking for normality using the Kolmogorov-Smirnov test. Categorical data were evaluated with the χ^2 and Fisher exact test, with $P < 0.05$ being considered as significant.

Results

The mean patient age was 25.6 ± 5.8 years. On average, cases were monitored for 27.5 months

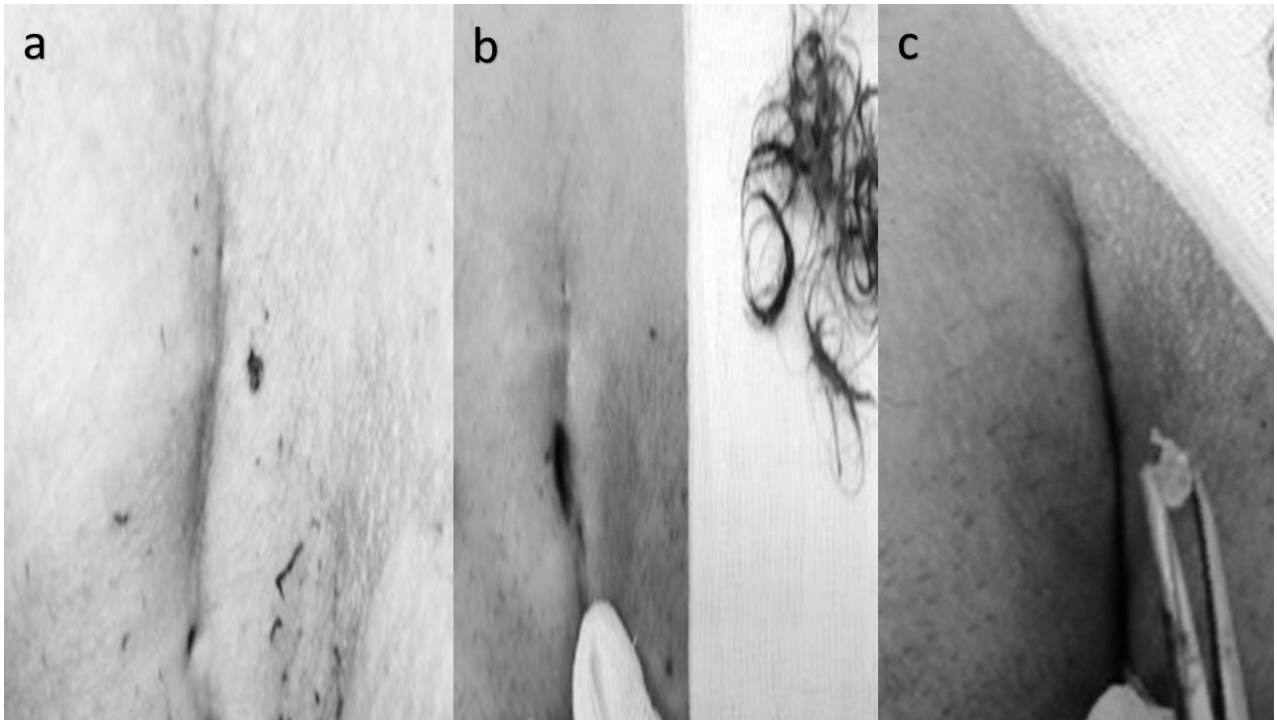

Fig. 1 (a) Appearance of an uncomplicated pilonidal sinus. (b) The pit is widened by a clamp after local anesthesia, and the hair is taken out. (c) The crystal phenol is filled into the sinus with the help of a clamp after the epithelial cyst was curated.

(range, 12–42 months). The demographic characteristics of the groups are given in Table 1. The groups were similar in terms of age, gender, duration of the symptoms, the healing time of the wound, and overall complications. However, length of hospital stay and recurrence rate were significantly lower in the CPT group. Although all patients in the CPT group received local anesthesia, 3 patients in the SPC group received spinal anesthesia. Patients in the CPT group did not require hospitalization, whereas patients in the SPC group required a median hospitalization length of 1 day (range, 1–3 days).

Although the overall complication rate was lower in the CPT group, it was not statistically significant ($P = 0.12$). Wound infection was the most common complication in both groups: 4 patients (8.9%) and 2 patients (3.5%) in the SPC and CPT groups, respectively. Other observed morbidities were seroma, hematoma, and skin abrasion. Seroma and hematoma were observed in 3 cases (6.7%) and 1 case (2.2%), respectively, in the SPC group, although neither was observed in the CPT group. Frequency of the skin abrasion was 3.5% (2 cases) in the CPT group. Specimens from the simple primary closure group were sent for histopathologic examination, which confirmed all samples to be benign.

Among the CPT patients, 38 (66.7%) recovered after single CPT, and the remaining recovered following repeated treatment. Recurrence rates were 28.9% (13 cases) and 10.5% (6 cases) in the SPC and CPT groups, respectively. We found the recurrence

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

	Simple primary closure group	Crystallized phenol group	*P*
Age, y, mean ± SD	26.6 ± 5.7	24.9 ± 5.9	0.13
Gender, n (%)			0.74
Male	42 (93.3)	51 (89.5)	
Female	3 (6.7)	6 (10.5)	
Duration of symptoms, mo, mean ± SD	11.2 ± 5.9	12.8 ± 5.1	0.15
Length of hospital stay, d, median (range)	1 (1–3)	0	<0.0001
Complications, n (%)	8 (17.8)	4 (7.0)	0.17
Wound infection	4 (8.9)	2 (3.5)	
Seroma	3 (6.7)	0	
Hematoma	1 (2.2)	0	
Skin abrasion	0	2 (3.5)	
Healing time, d, median (range)	20 (11–41)	21 (14–47)	0.17
Recurrence, n (%)	13 (28.9)	6 (10.5)	0.03

rate significantly lower ($P = 0.006$) in the CPT group compared with the SPC group by statistical analysis (Table 1).

Discussion

PSD has multiple methods of treatment, including the minimally invasive methods and complicated flap reconstruction procedures.[10–12] Although open wound healing and flap reconstruction procedures have been the preferred method for complicated cases,[12,13] CPT and SPC are alternative techniques to extended procedures for the treatment of uncomplicated cases.[7,8,10,14] However, the comparative advantages of these two methods have not been reported in the literature. The SPC and CPT methods are both practical, have faster wound healing, and have a shorter surgery time.[15–18] In our study, healing times were about 3 weeks in both the CPT and the SPC groups. Some clinicians do not prefer SPC because of unacceptable recurrence rate. However, it does not pose a challenge for flap reconstruction or open wound method if there is a requirement for reoperation.[16,19]

Some healthy tissue is also excised while removing the sinus and curating debris as well as the granulated tissue during SPC, as in our cases. Therefore, tissue defect is lower in CPT than in SPC. Furthermore, CPT is more cost-effective becaise it does not require hospitalization,[8,16,20] unlike SPC.[1,16] In our case series, patients in the SPC group were hospitalized for 1 to 3 days, but no hospitalization was required for patients who received CPT.

Spinal anesthesia may be required for a few patients during SPC. Onder *et al*[1] reported the use of spinal anesthesia in 8.0% of patients. A total of 3 patients (6.7%) required spinal anesthesia in our case series. All patients in the CPT group were anesthetized locally as described in the literature.[21] Spinal anesthesia is more invasive and expensive than local anesthesia and may cause complications like headache and urinary retention.[22]

Complication rates of both SPC and CPT were shown to be lower than flap reconstruction procedures; however, there is no direct comparison between SPC and CPT in the literature. Complication rates of 15.8% to 31.0% (for SPC) and 10.0% (for CPT) have been documented by different reports.[1,14–16,23,24] The complication rates in our case series were higher in the SPC group (17.8%) than in the CPT group (7.0%), but the difference did not reach statistical significance. Seroma and hematoma were observed only in the SPC group, skin abrasion was observed only in the CPT group, and wound infection was observed in both groups.

Doğru *et al*[15] reported a 95.1% success rate in 41 patients with repeated crystal phenol applications at the end of 24 months. Kayaalp *et al*[21] reported a 70.0% success rate with liquid phenol. Aygen *et al*[24] treated 36 patients who had recurrent PSD following primary closure or flap reconstruction with crystallized phenol and reported a 13.9% recurrence rate at the end of 54-month follow-up. The recurrence rate was reported to be between 5% and 40.5% in different reports.[7,15,24] In this study, we found a recurrence rate of 10.5% in the CPT group, whereas the SPC group had 28.9% recurrence in a median of 27.5 months of follow-up, which was statistically significant.

Limitations of the study

The limitations of this study can be explained as being its retrospective nature and relatively short monitoring length (27.5 months), as well as the limited number of patients. It may be considered as another limitation that there are similar papers already published in the literature; however, there is no report directly comparing the results of SPC with CPT.

Conclusion

CPT is advantageous for a shorter return to daily activity time and its nonrequirement of hospitalization. It has a lower recurrence rate compared with SPC. Although not statistically significant, it also has a lower complication rate compared with SPC. Therefore, CPT should be preferred over SPC for noncomplicated PSD cases.

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References

1. Onder A, Girgin S, Kapan M, Toker M, Arikanoglu Z, Palanci Y *et al*. Pilonidal sinus disease: risk factors for postoperative complications and recurrence. *Int Surg* 2012;**97**(3):224–229
2. Chintapatla S, Safarani N, Kumar S, Haboubi N. Sacrococcygeal pilonidal sinus: historical review, pathological insight and surgical options. *Tech Coloproctol* 2003;**7**(1):3–8

3. Milone M, Di Minno MN, Bianco P, Coretti G, Musella M, Milone F. Pilonidal sinus surgery: could we predict postoperative complications? *Int Wound J* 2016;**13**(3):349–353
4. Enriquez-Navascues JM, Emparanza JI, Alkorta M, Placer C. Meta-analysis of andomized controlled trials comparing different techniques with primary closure for chronic pilonidal sinus. *Tech Coloproctol* 2014;**18**(10):863–872
5. Oncel M, Kurt N, Kement M, Colak E, Eser M, Uzun H. Excision and marsupialization versus sinus excision for the treatment of limited chronic pilonidal disease: a prospective, randomized trial. *Tech Coloproctol* 2002;**6**(3):165–169
6. Kaymakcioglu N, Yagci G, Simsek A, Unlu A, Tekin OF, Cetiner S *et al*. Treatment of pilonidal sinus by phenol application and factors affecting the recurrence. *Tech Coloproctol* 2005;**9**(1):21–24
7. Dag A, Colak T, Turkmenoglu O, Sozutek A, Gundogdu R. Phenol procedure for pilonidal sinus disease and risk factors for treatment failure. *Surgery* 2012;**151**(1):113–117
8. 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* 2012;**97**(4): 288–292
9. Mahdy T. Surgical treatment of the pilonidal disease: primary closure or flap reconstruction after excision. *Dis Colon Rectum* 2008;**51**(12):1816–1822
10. Tavassoli A, Noorshafiee S, Nazarzadeh R. Comparison of excision with primary repair versus Limberg flap. *Int J Surg* 2011;**9**(4):343–346
11. Yalcin S, Ergul E. A single-surgeon, single-institute experience of 59 sinotomies for sacrococcygeal pilonidal disease under local anesthesia. *Bratisl Lek Listy* 2010;**111**(5):284–285.
12. Karakayali F, Karagulle E, Karabulut Z, Oksuz E, Moray G, Haberal M. Unroofing and marsupialization vs. rhomboid excision and Limberg flap in pilonidal disease: a prospective, randomized, clinical trial. *Dis Colon Rectum* 2009;**52**(3):496–502
13. Yıldız MK, Ozkan E, Odabaşı HM, Kaya B, Eriş C, Abuoğlu HH *et al*. Karydakis flap procedure in patients with sacrococcygeal pilonidal sinus disease: experience of a single centre in Istanbul. *ScientificWorldJournal* 2013;**2013**:807027
14. Hosam R, Yasser A, Waleed A, Ibrahim A, Mokhtar F, Mohammed F. Rhomboid flap versus primary closure after excision of sacrococcigeal pilonidal sinus (a prospective randomized study). *Egypt J Surg* 2012;**74**(4):305–308
15. Doğru O, Camcı C, Aygen E, Girgin M, Topuz O. Pilonidal sinus treated with crystallized phenol: an eight-year experience. *Dis Colon Rectum* 2004;**47**(11):1934–1938
16. Khaira HS, Brown JH. Excision and primary closure of pilonidal sinus. *Ann R Coll Surg Engl* 1995;**77**(4):242–244
17. Morell V, Charlton BL, Deshmukh N. Surgical treatment of pilonidal disease: comparison of three different methods in fifty-nine case. *Mil Med* 1991;**156**(3):144–146
18. Obeid SA. A new technique for treatment of pilonidal sinus. *Dis Colon Rectum* 1991;**34**(8):649–652
19. Al-Jaberi TMR. Excision and simple primary closure of chronic pilonidal sinus. *Eur J Surg* 2001;**167**(2):133–135
20. Gülpınar K, Pampal A, Ozis SE, Kuzu MA. Non-operative therapy for pilonidal sinus in adolescence: crystallised phenol application, "report of a case". *BMJ Case Rep* 2013;**2013**:pii: bcr2012008382
21. Kayaalp C, Ölmez A, Aydın C, Pişkin T, Kahraman L. Investigation of a one-time phenol application for pilonidal disease. *Med Princ Pract* 2010;**19**(3):212–215
22. Sungurtekin H, Sungurtekin U, Erdem E. Local anesthesia and midazolam versus spinal anesthesia in ambulatory pilonidal surgery. *J Clin Anesth* 2003;**15**(3):201–205
23. Gilani SN, Furlong H, Reichardt K, Nasr AO, Theophilou G, Walsh TN. Excision and primary closure of pilonidal sinus disease: worthwhile option with an acceptable recurrence rate. *Ir J Med Sci* 2011;**180**(1):173–176
24. Aygen E, Arslan K, Dogru O, Basbug M, Camci C. Crystallized phenol in nonoperative treatment of previously operated, recurrent pilonidal disease. *Dis Colon Rectum* 2010;**53**(6):932–935