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ORIGINAL ARTICLE

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Treatment of pilonidal sinus by phenol application and factors affecting the recurrence

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Abstract Background Phenol injection, a less invasive method, has become more popular for the treatment of sinus pilonidalis. Recurrence rates after the use of phenol have been reported to be less than those after other surgical methods. **Methods** In this study, we applied 80% phenol to 143 patients with sinus pilonidalis. Patients were re-evaluated at 1, 3, 6, 12 and 24 months after the phenolization procedure to search for any recurrences. Age, sex, skin color, occupation, hair distribution, complaints, macroscopic characteristics of the lesion, pouch volume, microbiological yield, complications of phenol injection, healing time, and recurrences were determined. **Results** The mean follow-up period was 24 months and the recurrence rate was 8.3% (12 of 143 patients). Volume of the sinus tract and number of sinus orifices were determined to be the factors significantly affecting recurrences ($p<0.05$). **Conclusions** Injection of 80% phenol is an ideal approach for the conservative treatment of sinus pilonidalis. This study confirms that this is an effective and costless method with low recurrence rates.

Key words Sinus pilonidalis • Phenolization • Recurrence

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Introduction

In 1833, Mayo was the first to report a hair-containing sinus. Since then, various treatment modalities have been advocated, including surgical and medical approaches, but none has been found to be superior. Radical excision has been the most preferred surgical procedure but the reconstruction step, which is closely related to postoperative morbidity and recurrence, is still controversial. High recurrence and high infection rates and long hospitalization periods appear to be the main problems with the primary closure technique, whereas marsupialization with secondary healing of the granulating wound takes time and requires regular outpatient dressing [1–5].

Phenol is a monosubstituted aromatic hydrocarbon commercially sold as a liquid product. It is naturally occurring in some foods, in human and animal wastes, and in decomposing organic material. Because of its anesthetic effects, phenol is used in medicines such as ointments, ear and nose drops, cold sore lotions, throat lozenges and antiseptic lotions. Conservative treatment of pilonidal sinus disease with phenolisation has been defined as a simple operation with similar results achieved by surgical procedures but has the advantages of a shorter inpatient stay and lesser productive power loss. Especially in view of the low costs and the high degree of patient comfort, sclerosing therapy with phenol is thus recommended as a successful treatment for complicated pilonidal sinus disease with lower recurrence rates [6–8].

Every method used in pilonidal sinus treatment has its own recurrence rate and many factors contribute to recurrence. In this study, as a less invasive method with comparable results to other techniques, sclerosing therapy with phenol was applied to 143 patients with pilonidal disease, and recurrence rates and possible risk factors affecting the recurrences were evaluated in a follow-up period of 2 years.

Materials and methods

During the period between November 1996 and August 2001, a total of 436 consecutive patients were treated for pilonidal sinus disease. Of these, 143 were treated with injection of 80% phenol in a prospective manner. Approval of the local ethics committee and written consent from the patients were obtained before the procedure. Patients with an acute pilonidal abscess or complex, multiple recurrent pilonidal disease were not included in the study and were treated with different types of surgery such as marsupialization with secondary healing, primary repair with excision, and Limberg flap reconstruction.

The procedure was done in an outpatient setting, using sterile equipment and aseptic conditions. We used an 80% phenol solution prepared from crystallized phenol (PHENOL, CRYSTALLINE, AMRE0126-100, Merck, Germany) by the Department of Pharmacological Sciences in our hospital.

Sex, skin color, occupation, hairy characteristics, complaints, microbiological yield, location and number of sinus orifices, volume of the sinus cavities, complications due to phenol application and recovery phase after the phenol application were recorded for each patient. Patients were placed prone in genupectoral position on the proctology table during the application. After an appropriate shaving of the gluteal region, taking care to include the lesion, the area was cleaned with polyvinyl pyrolidone and covered with a sterile dressing. Circumferential infiltration anesthesia using lidocaine HCl (2%) and epinephrine (0.00125%; Jetocaine) were applied locally. The sinus tracts were controlled with a slender guide. Linear incisions of 1 cm were made including the sinus orifices. From this incision, the subcutaneous hairy and infected tissues were curetted. The curettage materials were cultured for microbiological analysis. Minimal bleeding was stopped using sponges embedded in hydrogen peroxide. Volume of the cavity was estimated using normal saline. After removal of the sinus content, saline was injected into the cavity and the injected volume, when the saline came out from the opposite sinus orifice, was accepted to be the sinus volume. Protecting the edges of the cavity with sterile gauze pads, a sterile sponge was inserted in the cavity. A solution of 80% phenol with a ratio of 5% of approximate sinus volume was prepared and injected into the sinus cavity via a 16 F catheter. Volume of phenol used in the study varied between 0.2 and 3.0 ml (mean, 0.87 ml). After the injection, the catheter was removed and the sterile intracavitary sponge was left in place for 24 hours under sterile dressings. The patients were observed for 1 h after phenol application, and were then discharged to be followed on an outpatient setting.

After 24 hours, sponge with phenol was removed and the intracavitary brownish, dense, necrotic debris was removed. The sinus cavity was irrigated using normal saline to recalculate the volume. Irrigation and calculation procedure was applied during the follow-up visits. Recovery was evaluated on days 1, 3, 5, 7, and 15, and recurrences were looked for at 1, 3, 6, 12 and 24 months after the phenol application. Treatment was accepted as successful if the patient had no manifestation of pus or purulent discharge without any signs of infection. Recovery was also considered when the sinuses did not allow the probe or when there were only small holes and scars that could not be probed.

Recurrence of symptoms such as pain, purulent discharge and severe itching within the first month after the treatment was accepted as unsuccessful treatment. After a no-complaint period (which was defined as recovery), occurrence of the same complaints was regarded as recurrence.

Data derived from this study were analyzed using SPSS for Windows with *t* test, chi-square test, Npar test and Kruskal-Wallis test.

Results

Of the 143 patients, 137 were males (95.9%) and 6 (4.1%) were women (Table 1). Mean age was 26.3 years (range, 16–55 years). Most patients were young adults, between 20 and 30 years of age (70.7%). Age as a risk factor was not found to be statistically significant (p=1.230).

During the follow-up, recurrence was observed in 12 patients (8.3%). Recurrent lesion was in the same location in 10 patients (6.9%) and in different locations in 2 patients (1.4%). These recurrences occurred in the third month in 2 patients, sixth month in 6 patients, first year in 2 patients and second year in 2 patients (Table 3).

Skin color characteristics of patients were analyzed as a risk factor for recurrence: 97 patients (68%) were brunette, 32 were auburn (22%), 24 were light colored (10%). These results failed to show any statistical significance (p=0.211). Patients were analyzed according to their occupation: 35

Table 1 Characteristics of 143 patients with pilonidal sinus, and relationship with recurrence

	Patients, n	Recurrence, n
Sex		
Male	137	12
Female	6	0
Age, years		
15–25	46	4
26–36	64	5
37–47	22	2
48–55	11	1
Skin color		
Brunette	97	8
Auburn	32	2
Light colored	24	2
Occupation		
Office workers	35	3
Soldier drivers	22	2
Students	15	1
Medical staff	9	1
House wife	4	–
Others	58	5
Complaints prior to phenolization		
Local inflammation and purulent staining	87	–
Purulent staining only	30	–
Pain	22	–
Severe itching	4	–

Table 2 Factors evaluated for recurrences and complication of the phenolization procedure

	Patients, n	Recurrence, n	*p*
Location of sinus orifices			>0.05
Midline	110	10	
Midline and right lateral	4	–	
Midline and left lateral	8	1	
Right lateral to natal cleft	7	–	
Left lateral to natal cleft	14	1	
Number of orifices			<0.05
1	31	1	
2	60	3	
3	36	2	
4	12	3	
5	2	1	
6	1	1	
7	0	0	
8	1	1	
Cavity volume, ml			<0.05
2–4	15	0	
4–8	20	2	
8–12	90	5	
12–16	5	3	
16–20	2	2	
Recovery phase, days			>0.05
3–7	36	2	
8–12	95	9	
13–18	25	1	
Complications of phenolization			–
Chemical skin irritation	16	1	
Sterile liquid formation	7	1	
Local pain and itching	120	10	

Table 3 Time for recurrence in the follow-up period

Months	Patients, n (%)
1	0 (0.0)
3	2 (1.4)
6	6 (4.1)
12	2 (1.4)
14	1 (0.7)
16	1 (0.7)
Total	12 (8.3)

patients (24.4%) were office workers, 22 (15.4%) soldier drivers, 15 (10.4%) students, 9 (6.4%) medical staff, 4 (2.8%) housewives and 58 (40.6%) pertained to other occupation groups (soldiers, lawyers, butchers, greengrocers, musicians etc.). We found no statistical significance for the recurrence rates in these occupation groups (p=1.204); 110 patients (76.9%) had widespread hairy skin of the gluteal region, and 33 patients (23.1%) were sparsely haired. These properties were analyzed for recurrence rates and we found no statistically significant difference (p=0.225). Primary complaints of patients on admittance were local inflammation and purulent staining of the underwear in 87 patients (61%), only purulent staining in 30 patients (21%), pain in 22 patients (15.3%), and severe itching of the pilonidal sinus area in 4 patients (2.7%). When these complaints were compared for recurrence rates, there were no statistically significant differences (p=1.204).

Microbiological tests failed to show anaerobic organisms; 101 patients (71%) had negative and 42 patients (29%) had positive culture tests, mostly consisting of *Enterococcus feacium*, *Escherichia coli* and *Proteus mirabilis*. In those with positive tests, the recovery phase was longer. When compared for recurrence rates, we found no statistically significant difference (p=0.946).

The locations of sinus orifices were also examined (Table 2). They were in the midline on the natal cleft in 110 patients (77%), on the natal cleft midline plus right lateral location in 4 patients (2.8%), on the natal cleft midline plus left lateral location in 8 patients (5.6%), on a location right lateral to natal cleft in 7 patients (4.9%) and on left lateral location to natal cleft in 14 patients (9.7%). When these locations were analyzed for recurrence rates, we found no statistically significant difference (p=0.899). When sinus orifices were evaluated, 31 patients (21.6%) had 1, 60 patients (41.9) had 2, 36 patients (25.1%) had 3, 12 patients (8.4%) had 4, 2 patients (1.4%) had

5, one patient (0.6%) had 6, and one patient (0.6%) had 8 sinus orifices. Number of sinus orifices was found to be a statistically significant factor for recurrence (p=0.048). Volume of the cavities, reflected by subcutaneous curettage, varied from 1 to 20 ml (mean, 4.77 ml). Patients with a larger cavity volume had a longer recovery period and there were statistically significant differences between the cavity volume calculations and recurrence rates (p=0.001). Complications due to phenol application were chemical irritation of the surrounding skin in 16 patients (11.1%) and sterile abscess formation in 7 patients (4.9%). The remaining 120 patients (84%) had no complications except for local pain and itching complaints which never required any medical intervention. Recovery phase after the application was between 3 and 18 days (mean 8.1 days). Patients with a longer recovery phase had a higher risk for recurrence. When recovery phases were compared in terms of recurrence, no significant difference was found (p=0.126).

Discussion

Acquired and environmental factors have been more likely to take role in the etiology of sinus pilonidalis than congenital factors. Thus, less invasive and aggressive treatment regimens have become more popular [6–8]. Advocates of phenol application in the treatment of sinus pilonidalis depend on the fact that it has similar results when compared with surgical procedures, a shorter hospital stay, and less loss in work power.

Recurrences after the treatment cause physiological compromise and lead to various degrees of debilitation. Several studies reported different recurrence rates. Vara-Thorbeck et al. [8] studied 67 patients with sinus pilonidalis treated with 80% phenol with a follow-up of 1–3 years and found a recurrence rate of 16.1%. Results of other studies have also been similar; they have a follow-up period of 5 months to 6 years with recurrence rates of 1%–27% [7–9]. In our study, the recurrence rate was 8.3% with a follow-up of 24 months, and we found there was a statistically significant tendency to recurrence as the volume of the sinus pouch and number of the orifices increases. Recurrence of sinus pilonidalis occurs mostly in first 9 months after the treatment [10, 11]. In our study, follow-up was 24 months, and 10 of 12 recurrences occurred in the first year of treatment. Every method used in the treatment of sinus pilonidalis has its own recurrence rate [2, 12–14]. Surgical methods also have different recurrence rates [15–19]. Duchateau et al. compared excision, marsupialization and phenol application in the treatment of sinus pilonidalis and reported that results were not better than marsupialization and excision [16]. Use of phenol in the treatment of sinus pilonidalis has similar success rates with the various other surgical procedures. Shorter hospitalization period results in less loss in work power. Volume of the sinus tract and the number of sinus orifices were determined to be the factors significantly effecting recurrences.

In conclusion, injection of 80% phenol is an ideal approach for the conservative treatment of sinus pilonidalis. This study confirms that it is an effective and costless method with low recurrence rates.

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