Tech Coloproctol (2009) 13:189–193
DOI 10.1007/s10151-009-0519-x

REVIEW

Review of phenol treatment in sacrococcygeal pilonidal disease

Cuneyt Kayaalp · Cemalettin Aydin

Received: 17 January 2009 / Accepted: 20 April 2009 / Published online: 5 August 2009

Abstract
Background Investigating minimally invasive methods for treatment of pilonidal disease, we reviewed the techniques and the results of phenol treatment of pilonidal disease in the medical literature.
Methods A Pubmed search for all English language written papers and abstracts published between January 1964 and September 2007.
Results Mean time to return to work is 2.3 ± 3.8 days and mean healing time is 20 ± 14 days. Overall success rate is 87 ± 10% with a mean follow-up of 2.0 ± 1.1 years. The most common postoperative complications after phenolization are development of abscesses and cellulites. The incidence of morbidities was mean 8.9 ± 4.7%.
Conclusions Success rate looks better particularly in the cases that have 1–3 sinus orifices and comparable with the surgical methods. Though healing time of the wound is long, the procedure apparently lessens the time off work. Although results of this review indicate that phenol treatment may be beneficial for pilonidal disease, the lack of randomized studies results in only weak evidence. There is also the need for longer-term follow-up data.

Keywords Pilonidal disease · Phenol · Day case surgery

Introduction

Sacrococcygeal pilonidal disease is a chronic discharging wound in the natal cleft. It can cause pain and impact on quality of life and social function. The estimated incidence is 26 per 100,000 people, and most patients are men aged between 20 and 30 [1]. In a population-based study on soldiers who presented for their first medical examination, the incidence was found to be 8.8% [2]. In England, more than 11,000 admissions were recorded for pilonidal disease during 2000–2001 and the mean length of hospital stay was 4.3 days with a median of 1.5 days and this has accounted for more than 17,000 bed days [3]. The cost for inpatient pilonidal sinus surgery was estimated as £2,400 for an average hospital stay of 3 days [4]. Pilonidal disease is usually accepted as a minor surgical problem, particularly by the patients, however, it is a common health problem causing considerable loss of productive man-hours and hospital resources.

Surgery is a well described treatment for chronic pilonidal disease. Surgical methods generally center on excision of the sinus tracts followed by primary midline and off-midline closure or leaving the wound open to heal by secondary intention [1]. Ideal treatment of pilonidal disease should be simple, cost effective, preferably be done in outpatient settings under local anesthesia, cause minimal discomfort and time off work, and have a low recurrence rate. Surgical methods are still far from being an ideal treatment. They are usually performed under regional or general anesthesia, require hospital stays, and cause considerable loss of working time for the patients and the health professionals [5].

Non-operative treatments for pilonidal disease include phenolization of the sinuses or depilation of the buttocks by regular shaving, laser or depilatory creams [6–8]. Both methods are closer to the ideal treatment by application under local anesthesia in outpatient clinics with minimal discomfort and disability. They are simple and cost effective; however, they have not been practised extensively.

C. Kayaalp (✉) · C. Aydin
Department of General Surgery, Turgut Ozal Medical Center, Inonu University, 44280 Malatya, Turkey
e-mail: cuneytkayaalp@hotmail.com; ckayaalp@inonu.edu.tr

Table 1 Phenol treatment methods for pilonidal disease

Author	No of patients	Study protocol	Inpatient/outpatient	Anesthesia	LOS (day)
Kaymakcioglu (2005) [9]	143	Prospective	Outpatient	Local	0
Doğru (2004) [10]	41	Retrospective	Outpatient	Local	0
Schneider (1994) [11]	45	Retrospective	Outpatient	Local	0
Vara-Thorbeck (1990) [12]	67	Retrospective	Inpatient	General	1–3
Stansby (1989) [13]	104	Retrospective	Inpatient	General	1.8
Kelly (1989) [14]	44	Retrospective	Inpatient	General	1
Hegge (1987) [15]	48	Retrospective	Outpatient	Local	0
Blumberg (1978) [17]	8	Retrospective	NA	General[a]	NA
Shorey (1975) [18]	23	Retrospective	Inpatient	General	1
Rickles (1974) [19]	227	Retrospective	Outpatient	Local	0
Stephens (1969) [20]	30	Retrospective	Inpatient	General	0–1
Stewart (1969) [21]	30	Retrospective	Inpatient	General	2.9
Maurice (1964) [23]	21	Retrospective	Inpatient	General	1

LOS length of stay in the hospital, *NA* not available

[a] One patient under local anesthesia

Potential advantages of non-operative conservative methods led us to look into them and we aimed to compile the techniques and the results of phenol treatment of pilonidal disease in the medical literature.

Methods

In September 2007, a PUBMED search for all English written articles listing the keywords [("pilonid*" OR "sinus*") AND phenol*"] was performed. The resulting publications were searched and the references of all articles were cross-checked to decrease the possibility of missing relevant publications. The PUBMED search revealed 15 [9–23] publications, of which 13 included suitable data. One excluded publication mentioned phenolization, but it did not include any patient with phenol application [16]. Another article was excluded since the data was published twice [22].

Publications were between 1964 and 2005. There was no prospective randomized study and no case reports. Study designs were prospective cohort or retrospective. Most studies originated from Europe, only one from North America [19]. Patient demographics, selection criteria, preparation of the patients, application techniques and results were evaluated. Data were tabulated in tables, and sum of the columns in the tables and the means were calculated.

Patient demographics and patient selection

There are total 831 patients with a mean age 27 (range 14–67). There is a male preponderance of 83%. Patient selection criteria are not mentioned in some studies but generally acute pilonidal abscesses are excluded. If there is an abscess, first surgical incision with drainage and later phenol application is performed. Previously treated recurrent cases are usually included in the studies. Number of the sinus openings (ranging between 1 and 10) is not a limitation for the technique, however some studies exclude the cases with complex multiple lateral openings [9]. Number of the sinus openings is reported as an important factor in the results. Stansby and Greatorex [13] advocated phenol application for uncomplicated pilonidal sinuses with one or two openings, but consider excision more suitable for complicated sinuses with three and more openings. In the study of Kaymakcioglu and co-workers [9], recurrence was higher in the sinuses with 4–8 openings (37.5%) than with the 1–3 openings (4.7%). Dogru et al. [10] demonstrated that healing time was shorter with 1–3 openings than 4 or more openings.

Preparation of the patient

The initial procedures have been performed in inpatient clinics under general or regional anesthesia with 1 or 2 days hospitalization (324 cases, 39%) (Table 1). Afterwards, phenol application is usually done in outpatient settings under local anesthesia (507 cases, 61%). Procedures are performed with the patient in a prone Jack knife position. Buttocks are held apart by the use of a strapping, thus exposing the natal area and anal verge in the cases under general or regional anesthesia. In the cases under local anesthesia, buttocks are not stretched laterally by the strapping. After shaving of the operative area, skin is

cleaned with an antiseptic solution. Only Dogru and associates [10] suggest antibiotics for the patients with diabetes mellitus, patients receiving immunosuppressive agents, and patients with cardiac pathologies requiring antibiotic prophylaxis.

Preparation of the sinuses before phenol application

Probing the openings after anesthesia with slender guides or forceps is done in every patient to determine the directions and the communications of the sinuses. Methylene blue is not used routinely except in doubtful cases in which the opening communicates with the rectum or anal canal [11].

Surgical techniques were classified into two groups according to entrance into the sinuses: entrance from the sinus openings with or without dilatation, or entrance from a small incision. One study suggested that orifice dilatation was necessary if the orifice was smaller than 3 mm [10]. Incision techniques are generally preferred to make a better cleaning and for more controlled phenol application. Incisions are generally small (1 cm) and including the openings to communicate with them [9, 17, 19]. Minimal bleeding is stopped using compression, sponges embedded in hydrogen peroxide or diathermy. In both techniques hairs and debris in the sinuses are removed by curettage before phenol application.

Phenol application

Phenol is a necrotizing material and causes burns on mucosa and skin. Care is taken to avoid phenol from trickling down the natal cleft towards the anus. Therefore, a protective gauze is used for anus and the rest of the area was liberally coated with ointments (usually vaseline). The preferred phenol is liquid (pure or 80%) or crystallized. The crystallized phenol turns into liquid form quickly at body temperature [10]. Application tool is different according to the entrance technique. In the incision techniques, usually a swab cotton saturated with phenol is moved in the cavity and changing of the cavity color to whitish is observed. In the techniques without incision, one of the sinus openings are cannulated with a venous catheter or a blunt-ended metal trocar and phenol is injected into the sinus without pressure till phenol issues from the other openings and the edge of the orifices are blanched by the phenol. The injected volume of phenol is mean 1.7 ± 1.9 ml. The phenol is left for 1–3 min. The procedure is repeated 2–3 times in some studies [12–14]. In the end, the excess phenol is mopped away with the debris. The sinus is washed out with normal saline to prevent phenol leakage out to healthy skin and mucosa. No special dressing is necessary in most cases and a light dressing of gauze is sufficient.

Strict precautions are necessary throughout the procedure, especially in the handling of the phenol and it should not come into contact with the skin or eyes [9–14, 18, 21]. Thus, it is suggested that the operator and the assistant should wear glasses or eye protective masks against any splash of phenol. [11, 12, 18]. Other reported precautions are injection without pressure, fit the catheter snugly into the sinus opening, fix the bulb-headed cannula in the orifice with a purse-string suture or estimate the cavity volume with normal saline before the injection to prevent the inadvertent phenol overflow [9, 10, 14].

Protocols after application

The patients treated under local anesthesia are able to leave the hospital immediately after the procedure. Hospitalized patients who are treated under general or regional anesthesia are usually discharged the following day. After the first dressing, there is no longer need for regular dressings and ordinary sanitary napkins over the wound are enough to prevent soiling the clothes. Postoperatively, patients are informed to be meticulous in keeping the area clean and free from hair. Personal hygiene of the area is encouraged by frequent bathing and by not wiping toward the open wound after bowel movements. Keeping the area free from hairs can be done either by shaving or with a depilatory cream. Stephens and Sloane [20] mentioned that keeping the area free from hair was a mandatory step of phenolization of pilonidal sinuses. This almost certainly had been a beneficial influence on the number of cured cases. They suggested application of a depilatory cream over the sacrococcygeal area about once every 2 or 3 weeks.

Postoperative complications

The area is frequently (84% of the patients) dull for a few days after the injection, but the procedure was generally well tolerated by the patients [9]. During the healing time, there is usually little discharge from the sinuses and this discharge gradually diminishes before healing is complete. The most common postoperative complications after phenolization are development of abscesses and cellulites (8.7%) (Table 2). Authors attributed leakage of phenol into the surrounding tissues due to either too much pressure at the time of injections, or to opening up of a false tract by the preliminary probing [9, 11–13]. Dogru et al. [10] suggested crystallized phenol application without pressure and they did not report any abscess or cellulites. The abscesses are all cured by surgical drainage and the cellulites are

Table 2 Results of phenol treatment of pilonidal disease

Author	No of patients	Morbidities	Mean time to return work	Healing time	Success rate (%)	Follow-up time [mean (range)]
Kaymakcioglu (2005) [9]	143	23 (16.1%)	NA	3–7 days, 36 pts 8–12 days, 95 pts 13–18 days, 25 pts	92	2 years
Doğru (2004) [10]	41	0	0 day	42.7 days	95	2 years (6–98 days)
Schneider (1994) [11]	45[a]	6 (13.3%)	NA	43.4 days	60	3.5–7.5 years
Vara-Thorbeck (1990) [12]	67	5 (7.5%)	8.3 days	NA	91	1–3 years
Stansby (1989) [13]	104	8 (7.7%)	NA	8.7 days	75	8 months (3–48 months)
Kelly (1989) [14]	44	2 (4.5%)	NA	60 days	70	NA
Hegge (1987) [15]	48	0	NA	NA	94	3 (1–6) years
Blumberg (1978) [17]	8	NA	NA	14–21 days	100	22 (6–55) months
Shorey (1975) [18]	23	NA	0 day	NA	91	NA
Rickles (1974) [19]	227	NA	0 day	14–21 days	96	NA
Stephens (1969) [20]	30	3 (10%)	4 days	21–28 days	83	6–36 months
Stewart [21]	30	1 (0.3%)	11.6 days	21–28 days	73	18 months
Maurice (1964) [23]	21	3 (14.3%)	1 day	<21 days, 5 pts 21–42 days, 8 pts >42 days, 4 pts	81	18 months
Total	831	8.9 ± 4.7% (mean ± SD)	2.3 ± 3.8 days (mean ± SD)	20 ± 14 days (mean ± SD)	87 ± 10% (mean ± SD)	2.0 ± 1.1 years (mean ± SD)

pts patients, *SD* standard deviation

[a] 37 patients replied to the questionnaire

treated by antibiotic treatment. As morbidity, in one case (0.17%), splash of phenol was reported due to the separation of needle from the syringe [20].

Healing time

Patients lost minimal time off work and most of them are able to return to their normal routine immediately. There is no consensus on the definition of the treatment success. Some studies accept successful results with regard to cessation of symptoms which are pain, swelling, or discharge. In those studies, asymptomatic small orifices that do not allow probing are not accepted as treatment failure. Others accept successful treatment as anatomical healing with complete skin epithelization together with symptomatic relief. Different definitions cause variable results of treatment successes and the healing times. The healing time is completely variable but the majority of the cases result symptomatic improvement within 3 weeks.

Success rate

Wounds are inspected usually between 1–3 weeks intervals until the sinus heals and phenol treatment is repeated if necessary. Despite repeated applications, continuation of purulent discharge is accepted as resistant cases and prolonged discharge is treatment failure. Recurrence is regarded as occurrence of the same complaints after an asymptomatic period and a second cause of treatment failure. Most studies mentioned that repeated applications were done if necessary (continuation of purulent discharge). Time interval between the repeated applications were variable among the studies (1–6 weeks). Satisfactory results with no evidence of recurrence or prolonged discharge are obtained in 60–100% of the patients. The length of the follow-up period in these series is over 18 months for the majority. Recurrences are in the same location or in different locations. Recurrence times are usually in the first year after application. Age, skin color characteristics, location of the sinus orifices or occupations of the patients are not found as important in recurrence. Kaymakcioglu and associates [9] found that number of sinus orifices ($\geq$3, 5.5% vs. <3, 37.5%) and the cavity volumes ($\geq$12 ml, 5.6% vs. <12 ml, 71.4%) were significant for recurrence.

Overview

Success rate looks better particularly in the cases that contain 1–3 sinus orifices and comparable with the surgical

methods. Healing time of the wound is long but it looks like to provide less time off work. Although results of this review indicate that there may be benefits of phenol treatment at pilonidal disease, the lack of randomized studies including phenol and other treatments results in only weak evidence. There is also the need for longer-term follow-up data. At present it is difficult to recommend phenol treatment instead of standard surgery for pilonidal disease. But it is clear that it works in large group of patients with low morbidity and low work off time. In the future, this minimal invasive treatment can be a reasonable attempt before surgical excision of sinus. Prospective randomized studies comparing phenol and standard therapy (excisional surgery) can clearly answer the question whether phenol can be a viable alternative to excisional surgery. This review can be the evidence of necessities of the future prospective randomized studies about this topic.

References

1. McCallum I, King PM, Bruce J (2007) Healing by primary versus secondary intention after surgical treatment for pilonidal sinus. Cochrane Database Syst Rev. 17;CD006213
2. Akinci OF, Bozer M, Uzunkoy A, Duzgun SA, Coskun A (1999) Incidence and aetiological factors in pilonidal sinus among Turkish soldiers. Eur J Surg 165:339–342
3. Pilonidal sinus: is surgery alone enough? (2003) Colorectal Dis 5:205 (Editorial)
4. Abdul-Ghani AK, Abdul-Ghani AN, Ingham Clark CL (2006) Day-care surgery for pilonidal sinus. Ann R Coll Surg Engl 88:656–658
5. Petersen S, Aumann G, Kramer A, Doll D, Sailer M, Hellmich G (2007) Short-term results of Karydakis flap for pilonidal sinus disease. Tech Coloproctol 11:235–240
6. Armstrong JH, Barcia PJ (1994) Pilonidal sinus disease. The conservative approach. Arch Surg 129:914–917
7. Odili J, Gault D (2002) Laser depilation of the natal cleft—an aid to healing the pilonidal sinus. Ann R Coll Surg Engl 84:29–32
8. Schulze SM, Patel N, Hertzog D, Fares LG 2nd (2006) Treatment of pilonidal disease with laser epilation. Am Surg 72:534–537
9. Kaymakcioglu N, Yagci G, Simsek A et al (2005) Treatment of pilonidal sinus by phenol application and factors affecting the recurrence. Tech Coloproctol 9:21–24
10. Dogru O, Camci C, Aygen E, Girgin M, Topuz O (2004) Pilonidal sinus treated with crystallized phenol: an eight-year experience. Dis Colon Rectum 47:1934–1938
11. Schneider IH, Thaler K, Köckerling F (1994) Treatment of pilonidal sinuses by phenol injections. Int J Colorectal Dis 9:200–202
12. Vara-Thorbeck R, Mekinassi K, Berchid S (1990) Phenol treatment of pilonidal sinuses. Zentralbl Chir 115:777–780
13. Stansby G, Greatorex R (1989) Phenol treatment of pilonidal sinuses of the natal cleft. Br J Surg 76:729–730
14. Kelly SB, Graham WJ (1989) Treatment of pilonidal sinus by phenol injection. Ulster Med J 58:56–59
15. Hegge HG, Vos GA, Patka P, Hoitsma HF (1987) Treatment of complicated or infected pilonidal sinus disease by local application of phenol. Surgery 102:52–54
16. Duchateau J, De Mol J, Bostoen H, Allegaert W (1985) Pilonidal sinus. Excision–marsupialization–phenolization? Acta Chir Belg 85:325–328
17. Blumberg NA (1978) Pilonidal sinus treated by conservative surgery and the local application of phenol. S Afr J Surg 16:245–247
18. Shorey BA (1975) Pilonidal sinus treated by phenol injection. Br J Surg 62:407–408
19. Rickles JA (1974) Ambulatory surgical management of pilonidal sinus. Am Surg 40:237–240
20. Stephens FO, Sloane DR (1969) Conservative management of pilonidal sinus. Surg Gynecol Obstet 129:786–788
21. Stewart TJ, Bell M (1969) The treatment of pilonidal sinus by phenol injection. Ulster Med J 38:167–171
22. Stephens FO, Sloane DR (1968) Management of pilonidal sinus—a modern approach. Med J Aust 1:395–396
23. Maurıce BA, Greenwood RK (1964) A conservative treatment of pilonidal sinus. Br J Surg 51:510–512