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Minimally Invasive Treatment of Pilonidal Disease: Crystallized Phenol and Laser Depilation

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Pilonidal disease has been treated surgically and by various other methods for many years. The most important problem associated with such treatment is recurrence, but cosmetic outcome is another important issue that cannot be ignored. Today, crystallized phenol is recognized as a treatment option associated with good medical and cosmetic outcomes. We hypothesized that the addition of laser depilation to crystallized phenol treatment of pilonidal disease might increase the rate of success, and this study aimed to determine if the hypothesis was true. Patients who were treated with crystallized phenol and 755-nm alexandrite laser depilation were retrospectively analyzed. In total, 42 (31 male and 11 female) patients were treated with crystallized phenol and alexandrite laser depilation and were followed up between January 2009 and January 2012. In all, 38 patients (90.5%) had chronic disease and 4 (9.5%) had recurrent disease. Among the patients, 26 (61.9%) recovered following 1 crystallized phenol treatment, and the remaining patients had complete remission following repeated treatment. Some patients needed multiple treatments, even up to 8 times. None of the patients had a recurrence during a mean 24 months

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(range, 6–30 months) of follow-up. Whatever method of treatment is used for pilonidal disease, hair cleaning positively affects treatment outcome. The present results support the hypothesis that the addition of laser depilation (which provides more permanent and effective depilation than other methods) to crystallized phenol treatment (a non-radical, minimally invasive method associated with very good cosmetic results) can increase the effectiveness of the treatment and also reduce the recurrence rate of the disease.

Key words: Pilonidal disease – Laser depilation – Crystallized phenol

Andersson was the first to describe pilonidal sinus disease in 1847,[1] but pilonidal sinus disease—as currently understood—was first described by Hodges in 1880.[2] Many etiologic theories of the disease have been posited, leading to considerable debate. Once considered to be congenital, pilonidal disease is now considered an acquired dermatologic disease.[3,4] Etiology is not the only contentious issue concerning pilonidal disease, as there is currently no consensus concerning the optimal treatment method. Numerous surgical and nonsurgical techniques have been suggested for the treatment of pilonidal sinus, including the application of crystallized phenol.[5,6] Recurrence remains a significant problem associated with surgical and nonsurgical treatments. Reported recurrence rates are inconsistent, and the recurrence rate is the most important indicator of treatment success.

Karydakis[7] reported that the primary factor associated with recurrence is hair reentering the skin. He suggests that prevention of hair reentry into the skin, via daily bathing and regularly shaving for instance, can prevent recurrence. The wound should be well protected and monitored during the posttreatment period, and hygiene must be meticulous in the long term. As such, for a period of at least 2 years post treatment, patients are required to clean the treatment area of hair.

Laser depilation is the most common form of depilation and is one of the most effective. The duration of therapy varies according to the quantity and density of hair to be removed, and the treatment continues until the region is thoroughly cleaned. Laser depilation removes hair from the region surrounding a pilonidal sinus, improving the hygienic environment and reducing the risk of recurrence.[8] The present retrospective study aimed to investigate the effect on the recurrence rate of the addition of laser depilation to crystallized phenol treatment of pilonidal sinus disease.

Materials and Methods

The study retrospectively evaluated 42 cases treated for pilonidal sinus at Firat University Hospital, General Surgery Department, Elazig, Turkey, between January 2009 and January 2012. Hair removal was performed in all of the patients by the same technician using a 755-nm alexandrite laser (GentleLASE, Candela Laser Corp, Wayland, MA). Each patient underwent 6 to 8 laser depilation sessions at 6-week intervals. Laser depilation was performed in all patients 1 week before the first crystallized phenol treatment.

Local anesthesia was administered to the pilonidal sinus opening and sinus tract prior to cleaning and curetting the tract. In patients with a sinus too small for entry of a mosquito clamp (BH-109 Aesculap, Aescuplap Werke AG, Tutlingen, Germany), the sinus was expanded to permit its entry. In patients with more than one sinus opening, the same procedure was performed separately for each opening. Skin tissue surrounding the sinus opening was protected with nitrofurantoin ointment (Furacin, Eczacibasi Ilaç San ve Tic AS, Istanbul, Turkey) against the caustic and irritant effects of pure crystallized phenol. When crystallized phenol reaches body temperature as during administration into the sinus pouch, it becomes a liquid. In total, 3 to 5 g crystallized phenol was administered to the opening of each sinus.

Patients were advised to return to work and daily activities after treatment. Bathing after 48 hours was recommended to all patients. Patients were followed up every 3 weeks. At the end of the 3-week follow-up, all completely closed sinuses were considered healed, and these patients were called for the last control after 3 weeks. Sinuses that had not closed after 3 weeks were treated again with the same crystallized phenol method.

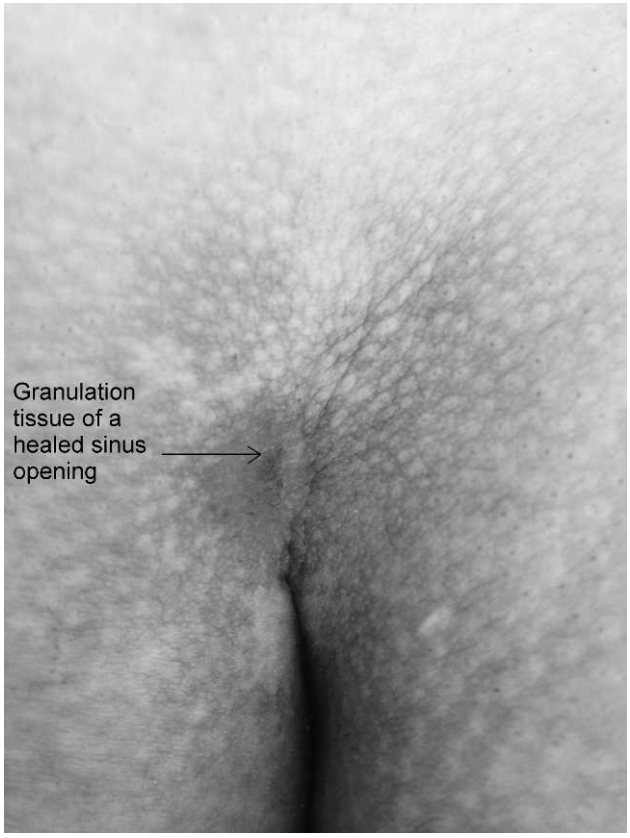

Fig 1. A patient that applied crystallized phenol two times and laser depilation five times.

Statistical analysis

Statistical analysis was performed using SPSS Version 10.05 for Windows (SPSS Inc, Chicago, IL) and the Kruskal-Wallis test.

Results

In total, 42 patients with pilonidal sinus were treated by two surgeons at the same hospital between January 2009 and January 2012. Mean follow-up was 24 months. Thirty-one patients (73.8%) were male and 11 (26.2%) were female. The mean age of the patients was 22.5 ± 6.4 years (range, 13–39 years). Crystallized phenol treatment and laser depilation were performed in all patients. In all, 90 phenol treatments were administered to the 42 patients: 26 patients (61.9%) had 1 treatment, 4 (9.5%) had 2 treatments, 3 (7.1%) had 3 treatments, 5 (11.9%) had 4 treatments, 2 (4.5%) had 6 treatments, 1 (2.3%) had 7 treatments, and 1 (2.3%) had 8 treatments.

The mean number of sinus openings in each patient was 2.4 ± 1 (range, 1–12). Thirty (71.4%) of the patients had midline orifices, and the remaining 12 had lateral orifices. In total, 270 laser depilation sessions were performed at 6-week intervals (range, 6–8 sessions per patient). In all, 4 (9.5%) sinuses were recurrent and 38 (90.5%) were chronic. All patients were managed using local anesthesia. None of the patients had a recurrence during follow-up (mean, 24 months; range, 6–30 months). Figure 1 shows a patient that applied two times crystallized phenol treatment with five times laser depilation and Fig. 2 shows a patient that had 3 orifices, 2 sinuses recovered after only one time crystallized phenol treatment.

Discussion

Effective treatment of pilonidal disease should be simple, painless, cost-effective, and performed with local anesthesia. It should not require hospitalization and a long time off work, and it should have a low recurrence rate.[9,10] Many surgical and nonsurgical techniques have been suggested for the treatment of pilonidal sinus, but none can prevent the risk of recurrence.[11,12] In general, wound-healing problems and a high recurrence rate occur following surgical treatment. Numerous surgical procedures have been described, but the optimal surgical treatment remains unknown. Currently, the best treatment option for pilonidal sinus disease is crystallized phenol treatment with laser depilation, which is considered to be minimally invasive and continues to find more support.[6,13]

The most common conservative treatment is administration of phenol to the sinuses. Many researchers use 2 to 3 mL of 80% liquid phenol.[14] In the present study, crystallized phenol was used, which differs from the liquid form. We used 3 to 5 g crystallized phenol for each sinus orifice. Crystallized phenol becomes liquid when it reaches body temperature, and in this respect it is somewhat similar to liquid phenol; however, the purity of crystallized phenol is higher than that of the liquid form. The aim of our method was to irritate the inner wall of the pilonidal sinus cavity with phenol (a sclerosing agent) and to fill the sinus cavity with granulation tissue. This procedure offers important advantages: it does not require operating room conditions; it can be performed under local anesthesia in an outpatient clinic; the treatment is well tolerated by all patients; and it is more cost-effective than other methods.[6,12] The only disadvantage of

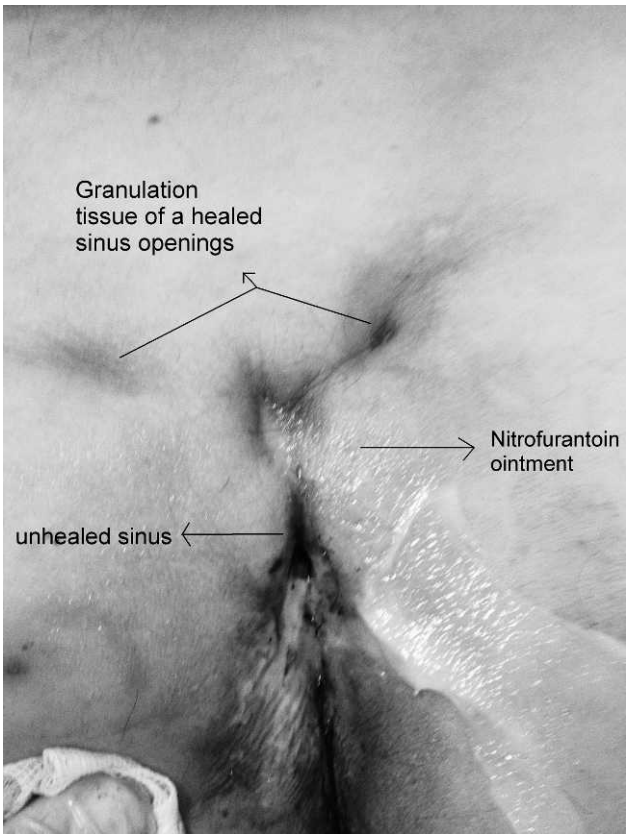

Fig 2. A patient that had 3 orifices, 2 sinuses recovered after only a one-time phenol cure.

this technique was that the success rate of one-time application was 61.9% (n = 26), with the other patients requiring repeated phenol treatments in 3-week intervals for cure.[12]

The treatment of pilonidal disease is associated with the risk of recurrence, regardless of whether conservative or the most extensive surgical methods are used.[15] According to most researchers, the primary cause of recurrence is the formation of scar tissue in the midline of the sinus cavity.[16] Karydakis reported that the primary factor related to recurrence is hair reentering the sinus.[7] Currently, the generally accepted notion is that pilonidal disease is acquired and that the main problem is hair, but there are 2 different theories. One theory is that the main factor is free hairs; for example, Patey reported that it could be seen between the barber's fingers,[17] and De Wilde *et al*[18] and Palmer[19] reported localizations on the hand. A second theory, according to Bascom,[20] is that hair follicles are the primary cause of the disease. First, the orifice of the follicle closes, and then the follicle swells. Next, the follicle becomes tense with inflammation, bursts under the skin, and a pilonidal abscess occurs. Subsequently, the pilonidal abscess is drained, and a chronic sinus develops.

Although the primary etiologic factor is free hairs according to both theories, the effect of hair near the sinus and the surrounding region cannot be ignored. As such, removing hair from the region of the sinus opening is a sound practice. The hair can be removed using creams, waxing, epilators, shaving, and laser depilation. There are some factors that contribute to hairs accumulating in that area, the most important of which are having a hairy body, losing too much hair, having a narrow and deep natal cleft, skin remaining moist for a long time, having scar tissue in the natal cleft or local trauma, and having poor hygiene.[20,21] All of these factors can be prevented, except for a narrow and deep natal cleft, which is an anatomic problem.

Removal of hair is important for preventing recurrence, as it facilitates good local hygiene and prevents free hair loss in the region. Mechanical methods of hair removal are associated with foci of infection and local trauma to the skin, therefore we consider laser depilation to be the most ideal method for hair removal. Some side effects can occur during laser hair removal, such as itching, inflammation, and swelling, which are due to the effects of laser energy on hair roots. Another adverse effect is the sensation of burning—a minor burning sensation similar to sunburn may occur within a few hours of laser treatment; however, it is of short duration. These side effects are temporary and usually resolve within 3 to 4 days.[22,23] Not all patients experience adverse effects, and when calculating the benefit–risk ratio, they can be ignored. Shaving or other methods of hair removal do not ensure permanent hair removal; long-term or permanent (70%) hair removal is provided by laser treatment,[24] which is very effective in preventing the recurrence of pilonidal sinus disease.

Owing to the small number of patients in the present study and the short follow-up period, definitive conclusions cannot be made; however, none of the present study's 42 patients had recurrence during mean follow-up of 24 months. The long-term outcome of the method described herein remains unknown. Additional comparative and prospective studies are needed to more definitively determine the effectiveness of laser hair removal on the recurrence of pilonidal sinus. We think surgeons should use laser hair removal, regardless of which method is used for pilonidal sinus treatment. Removal of hair is essential for

preventing recurrence, and hair removal can prevent the disease from developing. It is a known fact that the disease occurs in the presence of hair. As such, hair removal should be an integral part of pilonidal disease treatment. In addition, mechanically cleaning the coccyx region during bathing is important for removing hair that gathers in that region. In conclusion, the most important benefits of crystallized phenol treatment, as compared with classic surgery, are more rapid return to work and lack of hospital stay. We think that the success rate of crystallized phenol treatment may be increased with the addition of laser depilation.

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