

Case Report

Crystallized Phenol Application v/s Limberg Flap in the Treatment of Pilonidal Sinus- Our Experience

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Keywords

• Surgical site infection; Pilonidal Sinus; Block Randomisation; Limberg Flap; Crystalline Phenol
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Abstract

Background: Pilonidal sinus is a cavity in the subcutaneous tissue which is lined by granulation tissue contains hair and communicates with the surface by a track line usually by squamous epithelium continuous with the epidermis. It is a disease that most commonly arises in the hair follicles of the natal cleft of the sacrococcygeal area. Incidence is reportedly 26 per 100,000 populations, affecting males four times as often as females and predominantly young adults [1]. In this study we compared minimally invasive crystallized phenol application with modified Limberg flap reconstruction as the treatment strategies for pilonidal sinus in terms of length of hospital stay, rates of recurrence and infection, time taken for wound healing and complication rates.

Methods: A prospective study in which 22 patients undergoing treatment for pilonidal sinus were studied from December 2015 to November 2017. Block Randomisation applied. Post operative pain, duration of stay in the hospital, development of surgical site infections (SSI's) and other demographic data was analyzed.

Results: Out of 22 patients undergoing treatment for pilonidal sinus, 11 each were divided into 2 groups with group A, treated with Crystallized phenol application and group B treated with modified Limberg flap reconstruction. Crystallized phenol application is non invasive and patient friendly technique with less duration of stay in hospital and cost effective, only disadvantage is that it has high recurrence rate compared to Flap reconstruction.

Conclusion: Though there have been various other studies done recruiting patients in a bigger number, this study and the data obtained goes in favor of phenol treatment to be a convenient treatment of choice for pilonidal sinus disease because of its many advantages such as being a minimally invasive procedure, performed under local anesthesia, higher success rate after multiple applications, and decreased length of stay in hospital with minimal surgical scar formation.

INTRODUCTION

Pilonidal sinus is a cavity in the subcutaneous tissue which is lined by granulation tissue contains hair and communicates with the surface by a track line usually by squamous epithelium continuous with the epidermis. It is a disease that most commonly arises in the hair follicles of the natal cleft of the sacrococcygeal area. Incidence is reportedly 26 per 100,000 populations, affecting males four times as often as females and predominantly young adults [1]. Pilonidal sinus usually presents as an abscess or a chronically discharging, painful sinus tract. Irrespective of the mode of presentation the painful nature of the condition causes significant morbidity, often with a protracted loss of normal activity [2]. The management of chronic pilonidal disease is variable, contentious, and problematic. Principles of treatment require eradication of the sinus tract; complete healing of the overlying skin, and prevention of recurrence [3].

For patients who have chronic or recurring pilonidal sinus disease, definitive operative management is warranted. Numerous procedures have been described in literature, ranging

from simple incision and drainage to complex plastic flaps for cleft obliteration. Comparative studies in this field are rare. Most reports have been limited to single surgical approach with only few randomised controlled trials available in current literature [2].

Because there is no standard treatment, and it has a high recurrence rate, studies on pilonidal sinus have a potential value. Treatment options of pilonidal sinus vary from minimally invasive surgical interventions to complicated flap techniques; yet none of them were suggested as the most effective procedure so far. Although some studies report that flap techniques are associated with lower recurrence rates and higher patient satisfaction in comparison with other surgical procedures, there are several studies suggesting that flap techniques are extreme surgical procedures. The ideal treatment of pilonidal sinus disease should include minimum tissue excision with a lower recurrence rate. Additionally, the postoperative period should include short length of stay in the hospital, healing time as early as possible, minimal scar tissue formation, low recurrence and infection rates. Thus, easily performed treatments such as pit

excision, mechanical clearance of the sinus tract, and chemical therapies became popular.

Phenol, also known as carbolic acid, has antiseptic, anesthetic, and strong sclerotic features. Phenol treatment is one of the current popular conservative options to treat pilonidal sinus. It can be used both in liquid or crystallized form.

In this study we compared minimally invasive crystallized phenol application with Limberg flap reconstruction as the treatment strategies for pilonidal sinus in terms of length of hospital stay, rates of recurrence and infection, time taken for wound healing and complication rates.

METHODS

A prospective randomized controlled trial with data collected from R.L JALAPPA HOSPITAL, TAMAKA, KOLAR, in between the study period of December 2015 to November 2017. 22 patients undergoing treatment for pilonidal sinus in the Department of General Surgery were included.

11 patients were in group A who were treated with Crystallized Phenol application. 11 patients in group B treated with Limberg Flap reconstruction.

The primary purpose of the study was to provide the minimally invasive treatment to the patients.

Randomisation followed was Block Randomisation.

The subjects will be divided into subgroups called blocks, such that the variability within the blocks is less than the variability between blocks. Then, subjects within each block are randomly assigned to treatment conditions. This is called Block randomisation.

Objectives

- 1) To know the incidence of pilonidal sinus in R.L Jalappa Hospital
- 2) To know the incidence of pilonidal sinus based on occupation.
- 3) Comparison of incidence of pilonidal sinus among gender.
- 4) Comparison of conservative versus surgical management
- 5) To analyze, time for wound healing, surgical site infection, recurrence rate and other complications and morbidities.

Inclusion criteria

- 1) Age Group- all patients in between 25-60 years.
- 2) All patients willing to give informed and written consent.
- 3) All patients who have not undergone any prior treatment.

Exclusion criteria

- 1) Immuno compromised individuals (diabetics, HIV, bleeding disorder, patients on steroid and immunosuppressive therapy).
- 2) Patients allergic to phenol.
- 3) Patients with pre-existing SSI.
- 4) Patient presenting with conditions mimicking pilonidal sinus.

Surgical procedures

Crystallized phenol application: Crystallized phenol application was performed as described by Akin et al, [5]. After the application of local anesthetic, a mill metric circumferential incision was made to excise the pits with a fine blade. With the help of a curved clamp hair, debris and granulation tissue were removed from the sinus tract and the tract is curetted. Prior to crystallized phenol application (Figure 1), a pomade containing nitrofurantoin was applied in order to protect the surrounding tissue, and after that crystallized phenol particles were inserted to the tract with the help of a clamp.

Limberg flap reconstruction: The skin incision was first marked out with a sterile pen and ruler, then a rhomboid excision including post sacral fascia was performed to excise all of the sinus tracts. A fascio cutaneous flap was prepared from the right or the left side of the gluteal region including gluteal fascia, then the flap was placed over a removal drain and sutured to the pre sacral fascia (Figures 1A, 1B and 1C).



Figure 1a Prior to crystallized phenol application. A) Marking of the skin incision.

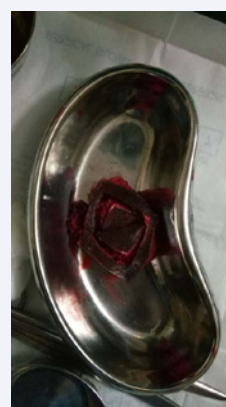


Figure 1b Rhomboid shaped flap.



Figure 1c Flap reconstruction with drain.

RESULTS

Patients were similar in both groups with respect to socio demographic and tumor characteristics. There were no significant differences for the type of treatment, the rate of drainage placement and duration, and the antibiotic prophylactic treatment.

In the present study patients with pilonidal sinus were aged between 3rd and 6th decade of life. The youngest was 25 years and oldest 58 years. Majority (63%) were in age group of 30 to 39 yrs (Table 1).

DISCUSSION

Pilonidal disease consists of a hair-containing sinus or abscess that involves the skin and subcutaneous tissues in the postsacral intergluteal region. In 1833 Herbert Mayo described a hair-containing sinus but not until 1880 did Hodge suggest the term "pilonidal", to indicate a disease consisting hair-containing sinus in the sacrococcygeal area [6].

- Pilonidal sinus developed from the cystic remnants of medullary canal persisting in the sacro-coccygeal region "-Tourneaux and Herrmann in 1887 [5].
- "Faulty development of median raphe in sacrococcygeal region leads to dermal inclusion which later become a sinus "- Fe're (1878) Lanne longue (1882) Bland Sutton (1922) and Fox (1935) [6,7].
- "Pilonidal sinus is a vestigial structure homologous with preen gland of the bird "- stone (1931) [8].
- "Vestigial sex gland" Kallet (1936) [9].

These theories were postulated based on the site of the pilonidal sinus and management was thought to be fundamental by excising and removing all embryologic remnants.

In early 20th century pilonidal sinus was hypothesized by Patey and Scarf as acquired by penetration of hair into the subcutaneous tissue with constant granulomatous reaction. During World War II pilonidal sinus gained prominence amongst soldier with high incidence so much so it came to be known as jeep disease [10].

Karydakis describes three factors that are involved in the hair insertion process: (1) the invader, consisting of loose hair; (2) a force that causes hair insertion; and (3) the vulnerability of the skin to the insertion in the depths of the natal cleft. Loose hair, leading with the root end, collects in the natal cleft. Friction

forces the hair to insert at the depth of the cleft, not at the sides. With the insertion of one hair, others can more easily follow, provoking the foreign body reaction and infection of pilonidal disease. Karydakis felt that the primary sinuses are the portals of entry of the hair and the secondary fistulas are the portals of hair exit [11]. Other factors like age, familial history, gender, trauma, poor personal hygiene, may also be involved to explain the occurrence of the disease in hairless people.

Although usually seen in the sacrococcygeal region, interdigital pilonidal sinus disease has been described in the hands of hairdressers and barbers sheep shearers (from the wool) [12], milkers (from the cow's hair) , dog groomers , and a man who worked in a slaughterhouse .Additionally, the disease has been described in the umbilicus , chest wall, anal canal , ear , and scalp . It is associated with indolent discharge, malodorous smell, pain.

Patients with pilonidal sinus often present with an acute painful swelling in the natal cleft associated with an abscess with, or without, the drainage of bloody purulent material (pus) from the sinus opening. Alternatively, they may present with a chronically discharging, and often painful, sinus tract. Irrespective of the mode of presentation, the painful nature of the condition causes significant morbidity and, although many tolerate symptoms for up to one year before seeking treatment, there is often a protracted loss of normal activity for these patients [6].

Primary sinus is found in the midline between Sacrococcygeal joint and the tip of coccyx. Secondary tracks spread laterally which emerge at skin as granulation tissue lined, subcutaneous, chronically infected, discharging sinuses [13].

Complications of pilonidal sinus include, sacral osteomyelitis, Necrotising Fascitis, Meningitis, Malignant transformation is rare but cases of squamous cell carcinoma and verrucous carcinoma have been reported [14].

Reason for recurrence could be

1. Improper removal
2. Overlooking of existing diverticulum
3. Entry of new tuft of hair.
4. Breakage of scar [14]

Recurrences commonly develop in the inferior midline of the scar. And is common in 3 years from the time of operative intervention [14].

In recent years, minimally invasive procedures have been suggested for the treatment of pilonidal sinus, including the application of crystallized phenol. Because the effective treatment of pilonidal disease should be simple, painless, cost-effective, performed with local anesthesia, and should not require hospitalization, a long time off work, and should have a low recurrence rate, the aim of the present study was to compare Limberg flap reconstruction (1) of the most convenient surgical procedures) with phenol application for the treatment of pilonidal sinus disease [15].

Phenol is a mono substituted aromatic hydrocarbon that has

acidic properties. It is in the state of crystalline solid at room temperature and turns to liquid form at higher temperatures. It can be used as liquid or in its crystallized form. Crystallized phenol has several advantages over the liquid format has better purity and handling properties than the liquid variant. The most common postoperative complications after liquid phenol treatment have been reported as skin and fat tissue necrosis due to high phenol concentration or high-pressure injection. Crystallized phenol becomes liquid at body temperature; it irritates the inner wall of the pilonidal sinus cavity, induces granulation and contraction, and then results in closure of the cavity [16]. This procedure has important advantages as it does not require operating room conditions and can be performed under local anesthesia in an outpatient clinic. The procedure has been reported to be well tolerated and cost-effective, and to result in quicker return to daily activities. Phenol treatment has several advantages: it is a minimally invasive and outpatient procedure, does not require hospital stay, and leaves a minimal postoperative incision scar. Therefore, this procedure has been suggested to increase the quality of life of patients with pilonidal disease. The only disadvantage of this technique is its higher recurrence rates when compared with those obtained with flap surgery. However, most of the high recurrence data of phenol treatment have been derived from one application; subsequent phenol applications could be easily done and improve success rate.

In our study patients with one sitting of crystalline phenol application had recurrence, and consecutive 3 sittings with a 21 day gap in between each sitting, proved effective in avoiding recurrence. We recorded a success rate of 93.6% with repeated applications. The rates of wound dehiscence and the length of stay

Table 1: Age Distribution of Patients.

AGE GROUP (In Years)	NUMBER OF CASES
<30	4
30-39	14
40-49	3
50-59	1
>=60	0

21 patients who were diagnosed and included in the study were males. Only 1 being female

Table 2: Male v/s Female.

Total Cases	Male	Female
22	21	1

Table 3: Occupational Distribution.

Student	1
Agriculture	6
Barbers	2
Drivers	6
Daily Wage Labour	5
Sitting For Long	2

27% of the patients in the study had Driving and Agriculture as occupation. 23% were Daily wage labourers. Again adding to the fact that friction, increasing sweat and poor hygiene has significance as a causative factor.

Table 4: Post Operative Course.

All Complications	Group A;n=11	Group B;n=11
Hematoma	4	8
Seroma	2	8
Suture material related	0	8
Fever	3	6
Discharge	0	2
Cutaneous complications	8	3
Wound Dehiscence	1	4
Surgical site Infection	4	3
Necroses	0	0
Wound healing delay	5	2
Allergy	0	1
Recurrence	3	0

Table 5: Post Op Pain Assessment.

	TOTAL	MILD	MODERATE	SEVERE
GROUP A	44	42	2	----
GROUP B	30	24	6	----

Pain assessment was done using the visual analog scale.

in hospital were significantly decreased in the group treated with phenol application. Our data supported the findings previously reported in several studies.

Flap treatment of pilonidal sinus disease is mostly performed under general or spinal anesthesia, whereas in crystallized phenol application local anesthetics are used. In patients who underwent crystallized phenol treatment, local anesthesia was used and these patients were discharged on the same day [17].

A large scar was observed after flap reconstruction, which generally causes an unpleasant aesthetic look, whereas the scar left following phenol application is almost unremarkable.

The major aim of the flap surgery in pilonidal sinus is to prevent recurrence by excising maximum tissue as needed and lateralizing or flattening the midline [18].

In our part of the world where ignorance masks reality, and in the modern materialistic world, as a surgeons prospective it would be correct to support the flap reconstruction, but as we follow what is called as the Evidence based medicine, and patient's safety and compliance and willing to follow up is at most important it is the duty of every professional to respect the patients decision and offer the best possible.

CONCLUSION

This study being a single center trial and our attempt to study the comparison between an operative and non operative procedure, it is to our knowledge the first study in a rural set up. There have been various other studies done recruiting patients in a bigger number, this study and the data obtained goes in favor of phenol treatment to be a convenient treatment of choice for pilonidal sinus disease because of its many advantages such as being a minimally invasive procedure, performed under local anesthesia, higher success rate after multiple applications, and decreased length of stay in hospital with minimal surgical scar formation.

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