

Original research article

## Surgical and Non-Surgical Management of Pilonidal Sinus

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### Abstract

**Introduction:** Pilonidal disease is now considered an acquired dermatologic disease. Numerous surgical and non-surgical techniques have been suggested for the treatment of pilonidal sinus. It usually requires a radical surgical procedure with a long stay in hospital, discomfort and loss of earning. The purpose of this study was to observe the outcome of surgical and non-surgical management of pilonidal disease.

**Material and methods:** The present prospective observational study was carried out from November 2014 to October 2016 in Tertiary Care Hospital. It describes the clinical profile and outcome of sacrococcygeal pilonidal sinus managed by surgical methods and non-surgical method. The study included a total of 46 patients out of which 24 underwent surgical management and 22 underwent management by non-surgical technique.

**Results:** The majority of patients in both groups were in the age group 15 to 35 years. Students were more affected with Pilonidal disease in both groups. (54.54% & 50 % respectively). Discharge followed by pain was the most common presenting complaint seen in both the groups. 54.54 % (12) cure rate was seen with single sitting whereas 27.27% (06) with two sittings and 18.18% (04) with three sittings. Wound dehiscence was seen as early complication in surgical group whereas skin ulceration was seen one case in non-surgical group. **Conclusion:** To conclude, non-surgical management of pilonidal sinus (Crystallized phenol injection) is an effective, feasible, low cost, simple, minimally invasive outpatient procedure with early recovery and return to work, better cosmetic outcome, less peri-operative pain and gives acceptable results.

**Key words:** Pilonidal, Sinus, crystallised phenol, Limberg flaps, Rhomboid flaps

### Introduction

In Latin, Pilus means 'hair' and nidus means 'nest'. Pilonidal sinus consists of a sinus in the intergluteal (natal) cleft which generally contains hairs hence the inflammation is a combination of an infection and foreign body reaction. Men are more commonly affected than women. It was so common among jeep drivers in 1935 to 1945 war that it was known as "Jeep Bottom".<sup>(1)</sup>

Pilonidal disease is now considered an acquired dermatologic disease. Numerous surgical and non surgical techniques have been suggested for the treatment of pilonidal sinus including

primary excision with closure, excision with marsupialisation, excision with application of fibrin glue/packing, excision with Limberg flaps, Rhomboid flaps and application of crystallized phenol. Recurrence remains a significant problem associated with surgical and non surgical treatments. <sup>(2)</sup> It usually requires a radical surgical procedure with a long stay in hospital, discomfort and loss of earning. The purpose of this study was to observe the outcome of surgical and non surgical management of pilonidal disease and outcome of modalities of treatment – surgical and non surgical in terms of perioperative pain and wound healing.

### Material and Methods:

The present prospective observational study was carried out from November 2014 to October 2016 in the Department of Surgery at a Tertiary Care Hospital. It describes the clinical profile and outcome of sacrococcygeal pilonidal sinus managed by surgical methods and non surgical method. A proforma was used to collect detailed clinical and laboratory history. The study included a total of 46 patients out of which 24 underwent surgical management and 22 underwent management by non surgical technique (crystallised phenol injection).

### Clinical Examination:

A detailed physical, Clinical, laboratory examination was recorded. Detailed examination of sinus was carried including number of openings, discharge from sinus, increased local temperature and tenderness.

### Crystallised Phenol Injection Therapy:

Sinuses with single/multiple openings and recurrent sinuses were managed by Crystallised Phenol Injection Therapy. Crystallised Phenol Injection Therapy was performed by using diluted Crystallised Phenol 80% and scoops in each case. Phenol was then applied into the sinus tract, waited for approximately 2 minutes and then was taken out by applying pressure on the sinus tract. This procedure was repeated 2 or 3 times depending on the width of the sinus. The wound was then closed with a gauze pack. Follow up clinical examination was performed in all cases on 14<sup>th</sup> & 21<sup>th</sup> day until the sinus had completely resolved or until three sittings had been performed. Ultrasound scan was done to assess radiological resolution of the sinus in some cases.

### Surgical Management

Patients in the surgical management group were admitted in the surgical ward and prepared for surgery under spinal anaesthesia. In the operation theatre with the patient positioned supine and the mode of management was decided by the operating surgeon's choice. (17 by Limberg Flap, 4 by Incision and Drainage followed by excision with primary closure at a later date, 2 underwent primary excision with closure and 1 underwent treatment by Karydakakis Flap Technique as per standard operative procedures). The patient was discharged home on until the wound healed.

### RESULTS:

The purpose of this study was to observe the outcome of surgical and non surgical management of pilonidal disease.

**Table 1: Distribution of patients according to their age.**

| Age Group (In Years) | Non surgical (Phenol) (n=22) | Surgical (n= 24) | Chi-square value | p-value |
|----------------------|------------------------------|------------------|------------------|---------|
| 15 - 25              | 14<br>(63.5 %)               | 16<br>(66.66%)   |                  | P=0.622 |

|         |                |                |      |    |
|---------|----------------|----------------|------|----|
| 26 - 35 | 06<br>(27.27%) | 07<br>(31.81%) | 1.54 | NS |
| 36 - 45 | 01<br>(4.5%)   | 01<br>(4.16%)  |      |    |
| 46 - 55 | 00<br>(00 %)   | 00<br>(00 %)   |      |    |
| 56 - 65 | 01<br>(4.5%)   | 00<br>(00 %)   |      |    |
| Mean±SD | 26.41±8.35     | 25.41±7.35     |      |    |

Table 1 shows that the youngest patient was 16 years old and eldest patient was 60 years old. The majority of patients in both groups were in the age group 15 to 35 years. The difference was statistically not significant.

**Table 2: Distribution of patients according to their Occupation.**

| Occupation           | Non surgical Phenol (n=22) | Surgical (n=24) | Total          |
|----------------------|----------------------------|-----------------|----------------|
| Student              | 12<br>(54.54%)             | 12<br>(50%)     | 24<br>(52.17%) |
| Farmer               | 04<br>(18.18%)             | 07<br>(29.16%)  | 11<br>(23.91%) |
| Businessman/Mechanic | 06<br>(27.27%)             | 05<br>(20.83%)  | 11<br>(23.91%) |
| Total                | 22<br>(47.82%)             | 24<br>(52.17%)  | 46             |

Table 2 shows that the students were more affected with Pilonidal disease in both groups. (54.54% & 50 % respectively).

**Table 3: Distribution of patients according to the Presenting Complaints.**

| Symptoms     | Non surgical Phenol (n= 22) | Surgical (n= 24) | Chi-square value | p-value       |
|--------------|-----------------------------|------------------|------------------|---------------|
| Skin Changes | 00                          | 05<br>(20.83 %)  | 5.14             | P=0.023<br>S  |
| Swelling     | 03<br>(13.63 %)             | 08<br>(33.33%)   | 2.45             | P=0.118<br>NS |
| Discharge    | 22<br>(100 %)               | 22<br>(91.66%)   | 1.92             | P=0.167<br>NS |
| Pain         | 14<br>(63.63 %)             | 21<br>(87.5 %)   | 3.59             | P=0.058<br>NS |
| Fever        | 00                          | 04<br>(16.66 %)  | 4.02             | P=0.042<br>S  |
| Ulcer        | 01<br>(4.5%)                | 03<br>(12.5%)    | 0.915            | P=0.330<br>NS |

Table 3 shows that the Discharge was seen in 44 patients followed by pain 35 patients was the most common presenting complaint seen in both the groups. While swelling was seen in 11 patients.

**Table 4: Distribution of patients according to the Presenting Signs.**

| Signs    |   | Non-surgical Phenol (n = 22) | Surgical (n = 24) | Chi-square value | p-value       |
|----------|---|------------------------------|-------------------|------------------|---------------|
| Openings | 1 | 10<br>(45.45%)               | 10<br>(41.66%)    | 0.136            | P=0.934<br>NS |
|          | 2 | 08<br>(36.36 %)              | 10<br>(41.66%)    |                  |               |

|  |   |                 |                |       |               |
|--|---|-----------------|----------------|-------|---------------|
|  | 3 | 04<br>(18.18 %) | 04<br>(16.66%) |       |               |
| <b>Skin Swelling</b>                       |   | 03<br>(13.63 %) | 08<br>(33.33%) | 2.45  | P=0.118<br>NS |
| <b>Temperature</b>                         |   | 00              | 04<br>(16.66%) | 4.02  | P=0.042<br>S  |
| <b>Tenderness</b>                          |   | 00              | 05<br>(20.83%) | 5.14  | P=0.023<br>S  |
| <b>Discharge</b>                           |   | 12<br>(54.54 %) | 15<br>(62.5 %) | 0.30  | P=0.584<br>NS |
| <b>Scar (Previous operative procedure)</b> |   | 01<br>(04.54 %) | 03<br>(12.5 %) | 0.914 | P=0.339<br>NS |

Table 4 shows that discharge was the most common sign. Discharging sinus with single opening was seen in 10 (45.45%) in non surgical whereas 10(41.66%) in surgical group followed by multiple openings.

**Table 5: Non surgical Phenol Injection.**

| No. of sittings | No. of patients (n=22) | %     |
|-----------------|------------------------|-------|
| 1               | 12                     | 54.54 |
| 2               | 06                     | 27.27 |
| 3               | 04                     | 18.18 |

Table 5 shows that 54.54 % (12) cure rate was seen with single sitting whereas 27.27% (06) with two sittings and 18.18% (04) with three sittings. None of the patients in the non surgical group (crystallised phenol injection group) had to be converted to the surgical group.

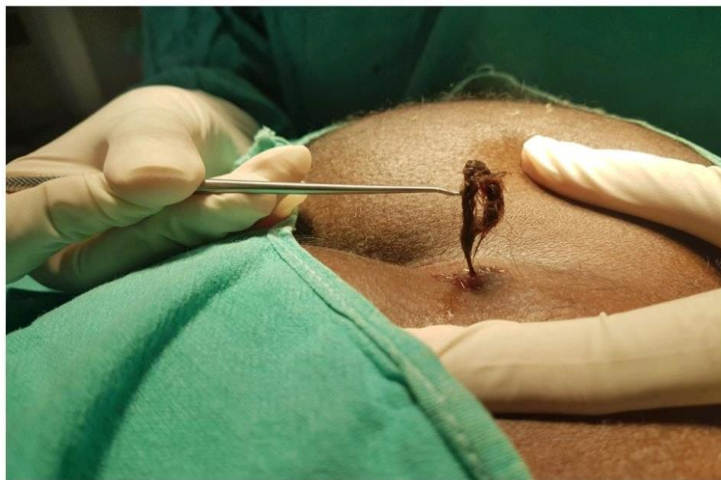
**Table 6: Distribution of patients according to the Complications.**

| Complications              | Non surgical Phenol (n = 22) | Surgical (n = 24) | Chi-Square value | p-value        |
|----------------------------|------------------------------|-------------------|------------------|----------------|
| <b>Pus discharge</b>       | 02<br>(09.09 %)              | 08<br>(33.33 %)   | 3.56             | P=0.006<br>S   |
| <b>Wound dehiscence</b>    | 00                           | 03<br>(12.5%)     | 1.30             | P=0.078<br>NS  |
| <b>Flap necrosis</b>       | 00                           | 01<br>(04.16 %)   | 0.937            | P=0.333<br>NS  |
| <b>Recurrence</b>          | 00                           | 02<br>(8.33 %)    | 1.27             | P=0.0131<br>NS |
| <b>Cosmesis (Scar)</b>     | 01<br>(04.54%)               | 24<br>(100 %)     | 42.2             | P<0.0001<br>S  |
| <b>Pain (Intermittent)</b> | 03<br>(13.63%)               | 04<br>(16.66 %)   | 0.0871           | P=0.775<br>NS  |

Table 6 shows that the Wound dehiscence was seen as early complication in surgical group whereas skin ulceration was seen one case in non surgical group. No recurrence was seen in on surgical group while there was recurrence in 2 patients in the surgical group with scarring seen in all patients in surgical group.



**Figure 1: Visible hair in the pilonidal sinus opening**



**Figure 2: Bunch of hair extracted from pilonidal sinus**



**Figure 3: Scooping of the sinus tract to remove the debris**





**Figure 4: Crystallised phenol injection into the pilonidal sinus**



**Figure 5: Healed Pilonidal sinus after a single injection of crystallised phenol injection**



**Figure 6: Blackening at the wound edges in a Limberg flap**



**Figure 7: Wound dehiscence in a Limberg flap**



**Figure 8: Ulceration following phenol injection**



**Figure 9: Healed scar of Limberg flap**

**Discussion:**

The present prospective observational study was carried out from November 2014 to October 2016 in the Department of Surgery at a Tertiary Care Hospital to observe the outcome of surgical and non surgical management of pilonidal disease in 46 patients.

In the present study the mean age in surgical group was 25.41 +/- 8.35 years and nonsurgical group was 26.41 +/- 7.35 years. **Sakcak I et al (2010)** study<sup>(3)</sup> had the age range of 16 – 44 years & mean age was 27.4 years. **Wani M et al (2016)**<sup>(4)</sup> in their study of 40 patients observed that the majority were in the age group of 18 to 45 years.

In our study, most of the cases were from student population. **Bolandparvaz S et al (2012)**<sup>(5)</sup> found that drivers were the most common affected group followed by university students. Also, sitting time of more than 4 hours per day was found to be a risk factor. **Rajalakshmi G et al (2014)**<sup>(6)</sup> study in their suggested that pilonidal sinus is more common in physically active age group.

In our study, 14 out of 24 patients (58.3 %) in surgical group and 14 out of 22 patients (63.6 %) in the non surgical group had less than 6 months duration of complaints whereas 8 out of 24 patients (33.3%) in surgical group and 4 out of 22 patients (18.2 %) in non surgical group had 07 to 12 months duration of complaints, thus correlating with the above studies.

**Girgin M, Kanat B (2014)**<sup>(7)</sup> in their study of 48 patients had 8 sinuses with an acute presentation (16%) and 40 (84%) were chronic. **Irpattire and Chakrod (2016)**<sup>(8)</sup> reported that the average duration of symptoms in the patients was reported to be 10.4 months.

In our study, most common presenting symptom was discharge from the sinus 22 (91.66 %) patients and pain in 21 patients (87.5 %) in the surgical group. All the 22 patients (100%) had sinus, followed by pain in 22 patients (63.6 %) in non surgical group. Followed by complaints of swelling in 08 patients (33.33%) in surgical group and 03 patients (13.63 %) in non surgical group. **Onder A et al (2012)**<sup>(9)</sup> out of 144 patients, 115 patients (79.9%) patients presented with discharge, 58 patients presented with pain (40.3%), and 36 patients (25 %) patients presented with swelling. **Karakas BR (2013)**<sup>(10)</sup> study reported that pain (84 %) was the commonest complaint followed by seropurulent discharge (69%).

In our study, in the surgical group 10 patients had 1 opening (41.66%), 10 \ had 2 openings (41.66%) and 4 \ had 3 openings (16.66%) and in the non surgical group 10 patients had 1 opening (45.45%), 8 had 2 openings (36.36 %) and 4 had 3 openings (18.18%). Hence in our study it has been found that the number of single sinus openings is more as compared to other studies. **Arslan K et al (2012)** in their study<sup>(11)</sup> of 25 patients of phenol injection the mean number of orifices was 4(range 1 to 8). In a study by **Girgin M et al (2012)**,<sup>(12)</sup> the mean number of sinus openings in each patient was 2.4 +/- 1 (range 1 – 12).

In our study, all the 22 patients in the non operative group were evaluated either by USG (10 patients) or MRI Sinogram (12 patients). However, in patients who were treated operatively, length of the tract was delimited intra operatively by Methylene blue injection into the sinus. **Mentes O et al (2009)**<sup>(13)</sup> had reported USG to be useful in accurate identification of sinus tract which can help in decision regarding the mode of management of pilonidal sinus disease. According to **De Parades V et al (2013)**<sup>(14)</sup> complementary investigations are seldom needed because the diagnosis of pilonidal sinus disease is clinically easy.



In our study, treatment of pilonidal sinus disease by phenol injection was done in 22 patients. 12 patients (54.54 %) required a single sitting, 6 patients (27.27%) required 2 sittings and 4 patients (18.18 %) required 3 sittings. Thus, our study matches with **Baqir Q K<sup>(15)</sup>**. **Baqir Q K (2009)<sup>(15)</sup>** study- 40% of patients required one injection while 55 % of the patients had two applications. **Arslan et al 2012<sup>(11)</sup>** – in their study of 25 sinus pilonidalis cases located around anus, all males applied crystallised phenol injection into the sinus- a total of 115 times.

In our study, VAS scores were noted on day 0, day 1 and day 7 of the procedure. On day 0, in surgical group the VAS score was 5.66+/-1.57 and in non surgical group was 3.22+/-1.87. The above findings thus match with the result of lesser perioperative pain in the non surgical group as shown by **Mahdy T<sup>(16)</sup>** and **Topuz O<sup>(17)</sup>**.

**Mahdy T (2008)** in his study<sup>(16)</sup> found that patients receiving flaps reported significantly more comfort regarding time to sitting on toilet without pain and time to walking without pain. In the primary closure and flap reconstruction groups, the mean (standard deviation) scores of post-operative VAS were 6.1 (1.2) and 7.4 (1.3) respectively. The difference was statistically significant ( $p < 0.0001$ ). **Non-Surgical - Topuz Omer et al (2014)<sup>(17)</sup>** found the VAS scores in patients managed by phenol injection to be in the range of 2.6+/-2.2 whereas in comparison to those managed by excision and primary closure to be 5.2 +/- 3.7.

In our study, the mean hospital stay in surgical group was 10.79+/- 7.68 days which is longer as compared to the above-mentioned studies. **Oueidat D et al (2014)<sup>(18)</sup>** found that hospital stay for excision and packing was 4.5+/- 2 days (2-14days) and for excision with primary closure 8+/- 4 days (4 – 24 days). **Bayhan Z et al (2016) study<sup>(19)</sup>** reported a hospital stay of 1.25+/- 0.4 days for Limberg group.

In our study all the patients in the non surgical group were treated as a day care case and discharged on the same day. In **Akan K (2013) study<sup>(20)</sup>** of 42 patients of Crystallised Phenol injection treatment group—all the patients were discharged on the same day. **Bayhan Z et al (2016)<sup>(19)</sup>** in their study patients in the phenol group were immediately discharged after the procedure.

In our study in surgical group, the wound healing time was 20.67 +/- 10.52 days which corroborates with the study of **MahdyT<sup>(16)</sup>**. **Mahdy T (2008)** in his study<sup>(16)</sup> of excision with primary closure and excision with flap reconstruction found that the time to complete healing in primary closure group was with a mean of 25.5 days and that for the flap procedure group was 15 to 20 days with a mean of 18.3 days. **Oueidat D et al (2014)** in their study<sup>(18)</sup> found that time to complete healing in Excision and packing group was 2 to 21 days and for excision and primary closure was 1 to 4 days.

In our study in non surgical group, it was 19.63 +/- 13.18 days which corroborates with **Dag A et al<sup>(21)</sup>**. **Dag Ahmed et al (2012)** in their study<sup>(21)</sup> the mean time to complete healing was 16 days (range 10 to 45 days). **Oueidat D et al (2014)** in their study<sup>(18)</sup> found that time to complete healing in phenol injection group was 2 to 10 days.

Duration of hospitalization ranged from 7 to 31 days in patients operated using Limberg flap technique, 4 to 6 days in patients managed by incision and drainage followed by excision and closure, hospitalization was for 7 to 9 days in patients managed by primary excision & closure. The Karydakias Flap operated patient developed pain, wound infection and wound dehiscence – which required daily cleaning and dressing and thus prolonged his hospital stay

to 19 days and a healing time of 3 weeks. Early complications such as pus discharge in 7 patients (29.16 %), wound dehiscence in 3 patients (12.5%) and flap necrosis in 1 patient (4.16 %). Delayed complications observed were: scar formation in all 24 cases, intermittent pain in 4 patients (16.66 %) and recurrence in 2 patients one operated by Limberg flap technique.

**Anjum S et al (2013)**<sup>(22)</sup> in their study in the group of 20 pilonidal sinus disease patients managed by Karydakis Flap Technique, over a follow up period of 6 months- there was pain (30%), Haematoma/seroma (0%), wound infection (10%), scar pain (5%), wound dehiscence (10%), with a healing time of 3 weeks and recurrence in 5%. **Bayhan Z et al (2016)** in their study<sup>(19)</sup> of 44 Limberg Flap patients, surgical site infection was reported in 8 patients (18.1%), haematoma in 8 (18.1%), wound dehiscence in 7 (15.9%) and recurrence in 3 patients (6.8%) over a follow up of 17.9 +/- 2.6 months.

In present study all the patients were discharged on the same day evening except one patient. Early complications such as pus discharge were seen in 2 patients (09.09%) and ulcer in 1 patient (0.04 %). There was no recurrence in the non surgical group in our study which correlates with **Girgin M, Kanat B**<sup>(7)</sup> study. In **Akan K et al (2013)** study<sup>(20)</sup> of 42 patients who underwent crystallised phenol treatment, infection was seen in 4 (8%), haematoma in 2 (4%) patients. Recurrence was seen in 6 (12 %) patients over a mean follow up period of 26 months. **Bayhan Z et al (2016)** study<sup>(19)</sup> of 37 patients treated by crystallised phenol injection surgical site infection was seen in 4 patients (14.8%), haematoma in 3 patients (8.1%).

In our study in the surgical group patients the cure rate was 91.66 % over a mean follow up of 6 months to 2 years which matches with the study of **Akan et al**<sup>(20)</sup> and **Bayhan Z et al**<sup>(19)</sup>. **Akan K (2013)** study<sup>(20)</sup> of 46 patients of Limberg Flap technique had a cure rate of 92 % over a mean follow up of 26 months. **Bayhan Z et al (2016)**<sup>(19)</sup> in their study of 44 patients managed by Limberg Flap had a cure rate of 93.2 %. **Girgin M, Kanat B (2014)** in their study<sup>(7)</sup> had a success rate of 61.9 % (n = 26) in one time phenol application. **Bayhan Z et al (2016)**<sup>(19)</sup> in their study reported a success rate of 94.5 % after multiple applications of phenol. Thus, the success rate in our study for non surgical group was 54.54 % for a single phenol application, 27.27 % for two phenol injections and 18.18 % for three phenol injections which matches with **Girgin M et al**<sup>(12)</sup>

### Conclusion:

From the present study we can conclude that, in the non surgical group, a success rate of 54.54 % with seen with a single sitting. Complications in the form of recurrence, scarring (cosmesis) with intermittent pain at the site of the sinus was more in the surgical group. Cure rate in the surgical group was 91.66 % whereas in the non surgical group the success rate was 100 %. To conclude, non surgical management of pilonidal sinus (Crystallised phenol injection) is an effective, feasible, low cost, simple, minimally invasive outpatient procedure with early recovery and return to work, better cosmetic outcome, less peri-operative pain and gives acceptable results in comparison with various surgical procedures employed in the treatment of pilonidal sinus disease.

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