

ORIGINAL ARTICLE



## Clinical presentation and management outcome of pilonidal sinus disease

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### ABSTRACT

**Background:** Pilonidal sinus disease (PSD) is a relatively common and socially disabling healthcare issue among young adult males whose occupational work involves prolonged sitting. It frequently affects the natal cleft region. The current study was undertaken to determine the epidemiologic profile of the PSD in our patients, to document the cure rate at 12 weeks, and any recurrence at a 2-year follow-up following radical surgical excision of the pathology.

**Methods:** This descriptive case series was undertaken at the National Institute of Rehabilitation Medicine (NIRM), Islamabad, for six years. The study included all patients who presented with the PSD and underwent radical surgical excision at the hospital. Patients who received some surgical treatment elsewhere were excluded. The primary outcome measure was the cure of the disease at 12 weeks, whereas the secondary outcome measure was the recurrence of the disease for 2 years of follow-up.

**Results:** There were 31 patients, including 24 (77.41%) males and 7 (22.58%) females. The mean age was  $27.35 \pm 6.96$  years. The sites affected included the natal cleft regions ( $n=24$ ; 77.41%), umbilicus ( $n=6$ ; 19.35%), and interdigital regions ( $n=1$ ; 3.22%). Most patients ( $n=22$ ; 70.96%) were drivers by occupation. The commonest clinical presentation was with draining sinuses found among all the patients. The surgical procedures performed included radical excision and reconstruction with Limberg flaps ( $n=21$ ; 67.74%), radical excision and direct closure of the defect ( $n=8$ ; 25.80%), and omphalectomy ( $n=2$ ; 6.45%). Recurrence of the disease was observed in one (3.22%) patient at the two-year follow-up.

**Conclusions:** PSD was found most frequently among young adult males. The majority of them were professional truck and lorry drivers. Natal cleft was the most welcome site of the disease. Limberg flap was the workhorse for managing the disease involving the natal cleft region. With radical surgical excision and reconstruction with Limberg flap, a recurrence rate of 3.22% was observed at two years of follow-up.

### KEYWORDS

Pilonidal sinus disease; Pilonidal sinus; Pilonidal abscess; Pilonidal sinus surgery; Limberg flap

### ARTICLE HISTORY

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### Introduction

Pilonidal sinus disease (PSD) is a peculiar inflammatory skin condition triggered by hair retention or penetration in the subcutaneous tissue planes under the skin. The condition is also thought to involve the obstruction of hair follicles, resulting in tufts of hair shafts found in the affected subcutaneous tissues. A vicious cycle starts once the hair is retained in the deeper tissue planes. There is foreign body-induced irritation, inflammation, abscess development, and sinus formation in the subcutaneous planes. The term "pilonidal" underpins this cycle of the pathogenesis. It is derived from two Latin words: "pilus," which means hair, and "nidus," which means nest. The disorder typically affects the anatomic locales of the natal cleft, umbilicus, and interdigital spaces [1-5].

PSD is typically found in young males. The reported global incidence is 26:100,000. Individuals at high risk of developing the condition include those with high body mass index, hirsute men, professionals whose job involves prolonged periods of sitting (such as truck and lorry drivers), barbers, and those with a family history of PSD [1,6-8].

Owing to a lack of consensus on management, there is considerable heterogeneity of practice regarding the

management of the PSD. Various treatment options have been employed to treat the PSD. These options range from conservative measures to radical surgical procedures. With conservative measures, recurrence rates are very high. On the contrary, radical excisional and reconstructive methods are associated with higher success rates and lower recurrence rates [8,9].

The current study was undertaken to determine the epidemiologic profile of the PSD in our patients, to document the cure rate of surgical treatment at 12 weeks, and any recurrence at 2 years follow-up following radical surgical excision of the pathology.

### Materials and Methods

This descriptive case series study was carried out at the Department of Plastic Surgery, National Institute of Rehabilitation Medicine (NIRM), Islamabad, over a period of six years. Written informed consent was taken from the patients. The study conformed to the principles of Helsinki's Declaration of 1975, as revised in 2008. The anonymity of the patients was guaranteed. Non-probability consecutive sampling was done. The study included all patients who

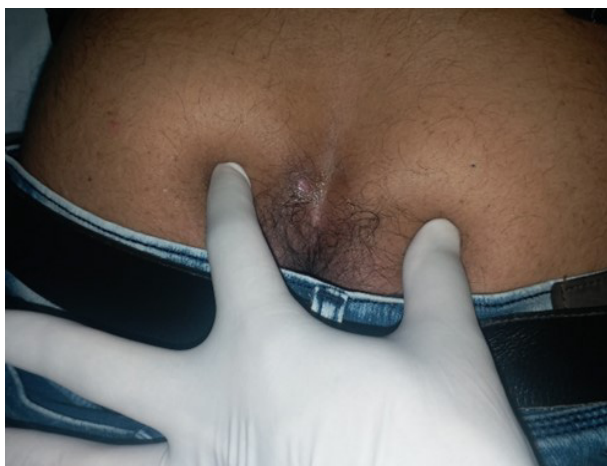
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presented with PSD and underwent radical surgical excision during the study period. Patients who received some kind of surgical treatment elsewhere were excluded. Patients with diabetes mellitus, immunosuppression, or end-organ failure were also excluded.

The patients were initially evaluated with a history and complete physical examination. Baseline investigations were performed to assess the general health and rule out associated systemic comorbidities. The demographic profile of the patients, anatomic sites affected, type of treatment instituted, cure rate of surgical treatment at 12 weeks, complications observed, and disease recurrence at 2 years following successful treatment were all recorded.

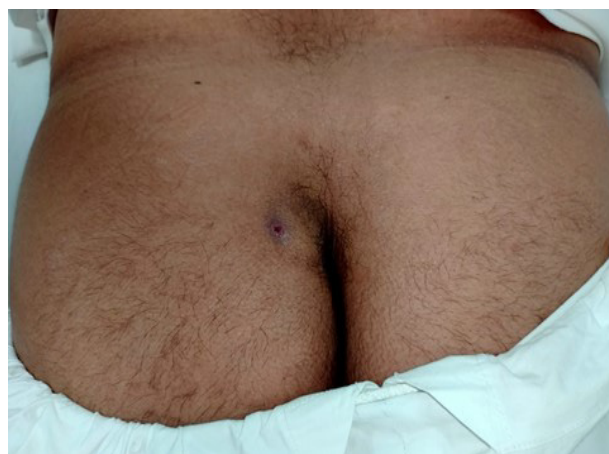
All the patients undergoing surgeries were hospitalized. They underwent the surgical procedures under spinal or general anesthesia. For the PSD of the natal cleft region, the patients were positioned in a prone. The sinus tract was delineated with Methylene blue injection to ensure complete excision of the diseased tissues. Thorough dissection was carried out down to the deep facial plan. The reconstructions were performed by employing adequately designed limberg flaps. In the case of the PSD of the umbilical region, the patients were positioned supine. Complete excision of the involved tissues was ensured. In recurrent cases, an omphalectomy was performed. Figures 1-4 show some illustrative cases of the PSD included in the study.



**Figure 1.** This clinical photograph shows a pilonidal sinus of the natal cleft region in a 23-year-old male. Swelling at the opening of the sinus tract is visible on the left side of the midline in the patient's prone position. The patient was a driver by profession and had been experiencing purulent discharge, pain, and fever. Hirsute features were noticeable in the patient.

### Statistical analysis

The data were analyzed using Statistical Package for Social Sciences version 22. Different descriptive statistics were employed to calculate frequencies, percentages, means, and standard deviation. The numerical data, such as the age of the patient, were expressed as Mean  $\pm$  Standard deviation, whereas the categorical data, such as the anatomic sites affected, were expressed as frequency and percentages. The percentages of various variables were compared by employing the chi-square test, and a p-value of less than 0.05 was regarded as statistically significant.



**Figure 2.** This clinical photograph shows a pilonidal sinus of the natal cleft region in a 33-year-old male. The punctate opening of the draining tract is visible on the right side of the midline.

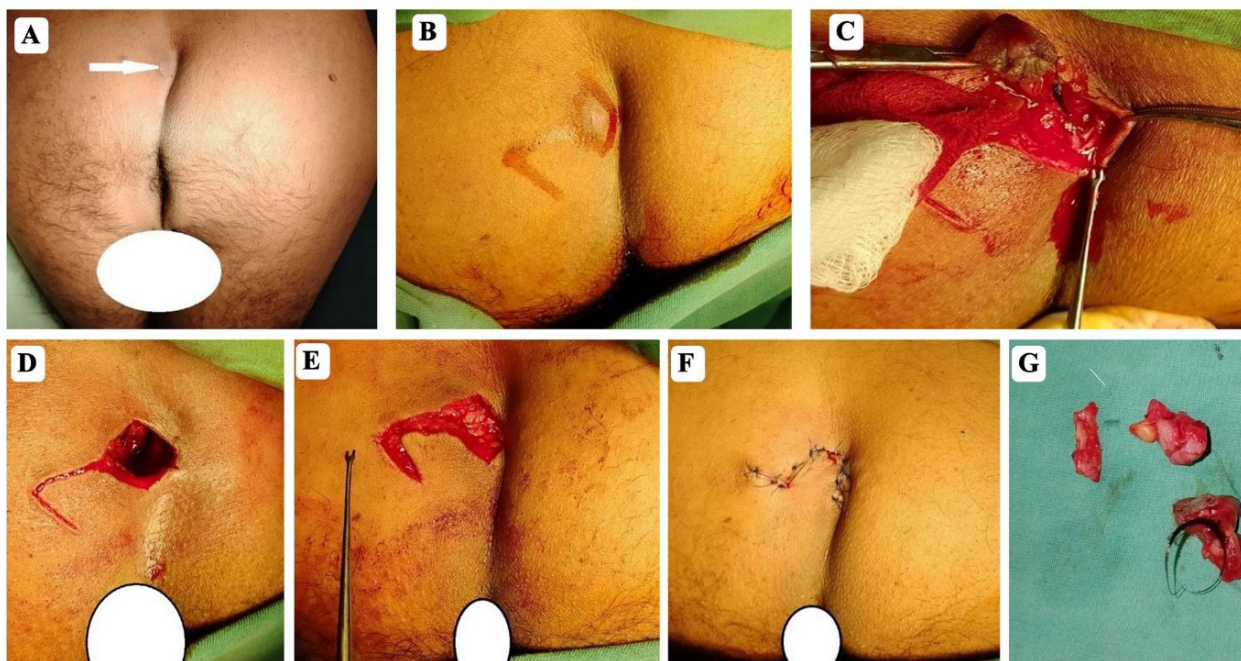


**Figure 3.** This clinical photograph shows a pilonidal sinus of the umbilicus region in a 21-year-old male. The patient had purulent discharge and itching of the umbilical region.

### Results

Out of the 31 patients, there were 24 (77.41%) males and 7 (22.58%) females. The age range was 17-40 years. The mean age of the patients was  $27.35 \pm 6.96$  years. The different anatomic regions affected included the following: natal cleft regions (n=24; 77.41%), umbilicus (n=6; 19.35%), and interdigital region (n=1; 3.22%). Occupation-wise, the majority of the patients (n=22; 70.96%) were drivers. It was followed by office workers 19.35% (n=6), students 6.45% (n=2), and barbers 3.22% (n=1). Draining sinuses were present among all the patients (n=31; 100%). Additional clinical findings included skin pits among 11(35.48%) patients; painful abscesses among 7(22.58%) patients; tender nodular swellings among 5(16.12%) patients; and scarred inflamed areas among 3(9.67%) patients. The hospital stay ranged between 1-3 days. The mean hospital stay was  $1.08 \pm 0.94$  days. The surgical procedures performed included radical excision and reconstruction with Limberg flaps (n=21; 67.74%), radical excision and direct closure (n=8; 25.80%), and omphalectomy (n=2; 6.45%). Recurrence of the disease was observed in one (3.22%) patient at the two-year follow-up (Table 1).





**Figure 4.** This clinical photograph shows the radical excision of the PSD and subsequent reconstruction with a Limberg flap. The PSD involved the natal cleft region in a 37-year-old male. (A) Preoperative photograph of the affected natal cleft region, (B) Design of the Limberg flap for reconstruction, (C) Radical excision of the PSD is in progress. The tuft or nest of hair is seen in the photograph, (D) Rhomboid excision of the entire pathological tissue has been performed, and the resultant defect cleansed in a standard fashion, (E) The Limberg flap has been elevated for reconstruction of the resultant defect following excision, (F) The Limberg flap has been transposed onto the defect and sutured in place, (G) The excision specimen of the PSD-affected tissues. The tuft of hair is clearly visible.

**Table 1.** Shows summary of the various demographic and outcome measures recorded among the patients.

Parameters	Percentage	p-value
<b>Gender:</b>		
Male (n=24)	77.41%	0.000*
Female (n=7)	22.58%	
<b>Age:</b>		
Up to 30 years (n=25)	80.64%	0.000*
>30 years (n=6)	19.35%	
<b>Duration of PSD:</b>		
≥2 years (n=18)	58.06%	0.001*
<2 years (n=13)	41.93%	
<b>Anatomic sites affected:</b>		
Natal cleft regions (n=24)	77.41%	0.001*
Umbilicus (n=6)	19.35%	
Interdigital region (n=1)	3.22%	
<b>Family history of PSD:</b>		
Present (n=1)	3.22%	0.000*
Absent (n=30)	96.77%	
<b>Obesity among the patients:</b>		
Present (n=17)	54.83%	0.300
Absent (n=14)	45.16%	
<b>Hirsutism among the patients:</b>		
Present (n=29)	93.54%	0.000*
Absent (n=2)	6.45%	

**Family history of PSD:**

Present (n=2)	6.45%	0.000*
Absent (n=29)	93.54%	

**Occupation:**

Drivers (n=22)	70.96%	0.000*
Office workers (n=6)	19.35%	
Students (n=2)	6.45%	
Barber (n=1)	3.22%	

**Interventions performed:**

Limber flap (n=21)	67.74%	0.000*
Radical excision and primary closure (n=8)	25.80%	
Omphalectomy (n=2)	6.45%	

**Recurrence at 2-years:**

Present (n=1)	3.22%	0.000*
Absent (n=30)	96.77%	

\* *p*-value significant  $\leq 0.05$

\*\* *p*-value insignificant  $\geq 0.05$

**Discussion**

In the current study, the patients ranged in age between 17 and 40 years. The published studies have reported young age groups being affected by the PSD. Bali I et al. from Turkey reported affliction of individuals with a mean age of 24 years [9], whereas Gurer et al. from India reported the mean age of the PSD patients to be 25.5 years [10].

In the current study, the majority of the patients were males. The current study's finding of male predominance conforms to most of the published studies wherein a similar predominant affliction of the males with the PSD has been reported [9,10]. Luedi MM et al., in their study on the gender-specific prevalence of the PSD, reported 79% affliction of males whereas 21% involvement of females among the PSD cases [11].

In our study, natal clefts constituted the most commonly affected anatomic areas. Our findings conform to most of the published literature on the PSD [1-7]. They all have also reported predominant involvement of the natal cleft regions with the disease. Has this area had some genetic predisposition to develop the PSD? There is no plausible answer to this question. One possible reason for the highest rate of involvement of this region with the PSD is that this area is prone to be subjected to repeated friction among drivers and other such professionals whose job involves prolonged sitting on seats or chairs.

In our study, umbilicus was the second most common site of involvement. The published literature has also reported on similar cases of the PSD. These patients often present with recurrent purulent discharge, and the pathology is initially mistaken to be omphalitis. The most commonly instituted surgical treatment entails sinus excision with preferable preservation of the belly button. The recurrent cases often fare well with total omphalectomy [12,13].

In the current study, the majority of the patients were professional drivers. The higher incidence among the professionals whose work involves prolonged sitting has also been reported in the literature [14]. Friction of the natal cleft regions facilitates the introduction of hair into the

subcutaneous tissue planes. Then, it initiates the characteristic vicious cycle that results in the PSD.

In the current study, only one patient was a barber by occupation. In the past, the PSD was considered to be a disease of barbers [3,5,15].

In our study, the commonest presentation of PSD was with draining sinus involving the affected area. The published studies have reported variable clinical presentation of the PSD. The clinical presentation ranges from asymptomatic pits on the skin to the acute presentation, characterized by a painful abscess, local tenderness, and other constitutional symptoms. In chronic disease, the patient presents with a chronically draining cyst or sinus, which has a variable degree of associated inflammation and scarring of the affected skin. There is significant discomfort and accompanying serious hygiene issues with the undergarments [1-5,16].

The published literature reveals a plethora of conservative and surgical techniques that have been employed to treat this PSD. The treatment aims at curing the disease, shortening the duration of hospitalization, limiting the period of morbidity or misery, and reducing the risk of disease recurrence. The treatment is usually tailored to the individual situation of each patient, with respect to the stage of the disease, the anatomic site of affliction, and the personal experience of the treating surgeon [1-3,17].

A variety of conservative measures have been reported for managing the PSD. Some authorities have employed Lasers to treat the disease. Lasers may help with the depilation of the hair tufts; however, Lasers are not helpful in eradicating the disease [18,19]. In the past, phenol in the form of local injections in liquid or crystallized status has also been used for treating the PSD. This option also did not hold promise as it had a high failure rate. There is a need for multiple sessions, and the associated side effects are also many. The phenol therapy has also been tried as an adjuvant to pit excision in an attempt to avoid the need for more extensive surgery [20-22]. Similarly, endoscopic intervention has also been tried to manage the PSD [23,24].

The available surgical armamentarium for addressing the PSD ranges from simple incision and drainage to radical excision and subsequent reconstruction with a Limberg flap. In this spectrum, a variety of procedures is available. For instance, cystectomy, curettage of the cyst, cystectomy with marsupialization of the resultant defect, excision of the sinus, surgical excision of the entire diseased tissues, and allowing the resultant wound to heal by secondary intention. Moreover, Bascom surgery, the use of the Karydakias flap, and, more popularly, the use of the Limberg flap [25-30]. The use of the Limberg flap ensures adequate excision of the pathology and subsequent reconstruction in the standard off-midline fashion. It has been reported to be an effective method both for patients with primary as well as recurrent PSD. The cure rates are higher than other methods, whereas the risk of complications and recurrence are significantly lower [9,31,32].

In our study, we observed recurrence in one patient (3.22%) at two years of follow-up. He had undergone excision and reconstruction with a Limberg flap. The published studies have reported a recurrence rate of 0.8–6% among patients who underwent rhomboid excision and reconstruction with Limberg flap [33-35].

Our study presents some strengths as well as certain limitations. The study tried to document the clinical epidemiology of PSD in the local population. It also documented the cure rate and recurrence rate following the surgical excision. The following are the limitations of the study. Firstly, the study was carried out in a single hospital. Secondly, it did not explore any causal associations of various risk factors and the PSD. Robustly designed multicenter studies are recommended to improve upon these limitations.

## Conclusions

PSD was found most frequently among young adult males. The majority of them were professional truck and lorry drivers. Natal cleft was the most common site of the disease. Limberg flap was the workhorse for managing the disease involving the natal cleft region. With radical surgical excision and reconstruction with Limberg flap, a recurrence rate of 3.22% was observed at two years.

## Patients' consent

Informed consents were taken from the patients for inclusion of their photographs in the study.

## Disclosure statement

No potential conflict of interest was reported by the author.

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