



## Overview of Pilonidal Sinus Diseases: Diagnosis, Complications, and Treatment

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### Abstract

Pilonidal sinus disease (PSD) is an inflammatory condition mainly affecting the sacrococcygeal area. Different techniques, such as invasive and minimally invasive procedures, are used for the treatment of PSD. Criteria for treatment choice include disease stage, surgeon preference, and patient compliance. An ideal treatment for PSD must be the total cure of the disease, rapid recovery to normal daily activities, and minimal morbidity. The validated surgical approaches for the management of chronic pilonidal sinus include minimally invasive approaches, healing by primary closure (including various types of marsupialisation), and healing by secondary intention. The aim of the present article was to review the diagnosis, complications, and treatment of pilonidal sinus diseases.

**Keywords:** Pilonidal Sinus Diseases: Diagnosis, Complications, Treatment

### Introduction

The origin of pilonidal disease was acquired, basing this theory on the high incidence of recurrence, as well as occurrence of disease in other areas of the body, such as the hands of a barber or sheep shearer. In fact, an acquired etiology of the disease is now the prevailing theory in the medical world (1). The incidence of pilonidal disease is approximately 26 per 100,000 population. Patient presentations are equally divided between acute and chronic disease while few patients present with asymptomatic disease (2).

Pilonidal disease occurs at least two times as frequently in men as in women, usually between the ages of 15 and 30; the disease occurs exceptionally before puberty or after 60 (3). Pilonidal disease in the general population has a male predominance. It occurs in the ratio of 3 or 4:1. In children, however, the ratio is the opposite occurring in 4 females for each male it afflicts (4). Although pilonidal disease was originally thought to be congenital due to abnormal skin in the gluteal cleft, the contemporary theory considers it acquired rather than congenital. The tendency of pilonidal disease to recur following an extensive surgical resection supports that theory (5).

The occasional occurrence of pilonidal cysts in locations other than the natal cleft (such as umbilicus, scalp, interdigital spaces, and between breasts) also supports the acquired theory. Others have reported pilonidal sinus occurring in locations subjected to local trauma from hair, such as on the hands of barbers, sheep shearers, and dog groomers (6).

The specific mechanism for the development of pilonidal disease is unclear, although the presence of hair and inflammation in the natal cleft are contributing factors. As a person sits or bends, the natal cleft stretches, thus damaging or breaking hair follicles and opening a pore or "pit." The pores collect debris and serve as a fertile environment for hairs shed from the head, back, or buttocks to lodge and become embedded. As the skin is tightly stretched over the natal cleft with movement, negative pressure is created in the subcutaneous space, drawing hair deeper into the pore, and the friction causes the hair to form a sinus (7).

### **Diagnosis of pilonidal sinus diseases**

Pilonidal disease represents a spectrum of clinical conditions that result from a common etiological agent (hair) causing varying degrees of inflammatory reaction in the host tissue which may or may not be complicated by secondary infection (8).

#### **1. Asymptomatic disease:**

The actual incidence of asymptomatic pilonidal disease is not known the disease is usually discovered during systemic examination and the patient is usually unaware of this sinus. Local examination may show a relatively unremarkable sinus tract in the sacrococcygeal region in the midline (9).

#### **2. Acute pilonidal abscess:**

Usually presents as an acutely painful swelling in the upper part of the natal cleft, usually in the midline, with erythematous and edematous surrounding skin. There may or may not be a pus point on the swelling. The examination must be carried out with gentleness as this is an extremely painful condition and even spreading of the buttocks may produce excruciating pain (10).

#### **3. Chronic pilonidal sinus:**

This represents the classical clinical picture of pilonidal disease. A midline pit occurs in almost all cases and is mandatory for clinical diagnosis. The pits can be seen draining mucoid, purulent, and/or bloody fluid. Hair within the sinus tract is seen in 67% of cases. Sinus tracts may be single or multiple, on the midline or off-midline, branching or non-branching (11).

#### **4. Complex pilonidal disease:**

This is a small subset of patients who, either due to gross neglect or failed surgical procedures, presents with atypical, extensive, recurrent disease with branching tracts with associated abscesses and overall poor quality of life (9).

### **(II) Investigations:**

Pilonidal disease is a clinical diagnosis with limited role for the investigation.

**(A) Sinography:** Injection of radio-opaque material into the track through the opening will give an idea about the depth, level and direction of the sinus track (10).

**(B) Magnetic resonance imaging** indicated in case of suspected malignant changes to detect the extension of the tumor or in case of multiple failed operations for pilonidal disease which may be associated with osteomyelitis with draining sinus tracts (12).

## **Complications of pilonidal sinus diseases**

**(A) Recurrence:** Recurrent pilonidal sinus falls into two categories with an incidence ranges from 0%-37%. The lowest rate of recurrence is found after excision of the sinus plus asymmetric closure. The highest rate of recurrence is found after excision with primary closure **(13)**.

### **(1) Early recurrence:**

This occurs within six months after operation and is due to failure of complete healing of wound after initial surgery. The unhealed surgical wound is a focus for infection and skin debris including hair which produces foreign body granuloma and tracks thus can develop squamous epithelial lining. This group accounts for 80 – 90% of all recurrences **(14)**.

### **(2) Late recurrence:**

This develops at least six months after complete healing of the wound and can be produced by further hair follicle infection. It mostly occurs within five years after operation, but have been observed 10 – 20 years later **(15)**.

### **(B) Malignant change:**

It is a rare complication (with an incidence of 0.1%) that is observed mainly in chronic, recurrent and untreated primary pilonidal disease and is associated with poor prognosis **(Figure 1)**. The histological type of tumor that arises from a pilonidal sinus is often squamous cell carcinoma (90%). Basal cell carcinomas and adenocarcinomas have also been reported **(16)**. The treatment is by en bloc resection of the tumor with adequate margins to include the pre-sacral fascia and all involved structures followed by coverage with appropriate soft-tissue flaps **(17)**.



**Figure (1):** Extensive Sacral Squamous Cell Carcinoma on top of chronic no healed pilonidal sinus for ten years **(16)**.

## **Treatment of pilonidal sinus diseases**

The ideal treatment varies according to the clinical presentation of the disease. First, it is important to divide pilonidal disease into the following two categories, which represent different stages of the clinical course:

### **(I) Asymptomatic pilonidal disease.**

### **(II) Symptomatic pilonidal disease:**

- (A) Acute pilonidal abscess
- (B) Chronic pilonidal disease
- (C) Complex or recurrent pilonidal disease **(17)**.

- Surgical management is then tailored to the classification category with the following goals:

- [1] Wound healing with a low risk of recurrence
- [2] Short hospitalization and early return to normal daily activities
- [3] Maximal patient comfort
- [4] Low morbidity, with few wound management problems (12).

**(I) Treatment of asymptomatic pilonidal sinus:**

Asymptomatic PD may be treated conservatively by shaving the natal cleft, improved hygiene and mechanical removal of shed hairs. Laser removal of hair in the natal cleft is increasingly popular (18).

**(II) Treatment of Symptomatic pilonidal disease:**

The mainstay of treatment is surgical. Antibiotics may be indicated in purulent stages before surgery or in rare cases of systemic infection. Prophylactic use of antibiotics in the surgical treatment of pilonidal disease remains unproven (19).

**(A) Acute pilonidal abscess:**

Simple incision and drainage are often advocated for pilonidal abscesses which have a single or few (<3) midline pits. The incision is preferably made in a paramedian, thus avoiding a midline scar. If the incision is given in the midline, then all efforts must be made to saucerize the abscess cavity to promote healing by secondary intention from deep to superficial. Lower rates of recurrences were reported when incision and drainage was combined with curettage of the abscess cavity (12).

**(B) Chronic pilonidal sinus:**

Although chronic pilonidal sinus has been surgically treated for more than 100 years, there is still no standard treatment approved by all surgeons (15).

**Two main lines are accepted in treatment of chronic pilonidal disease:**

**I. Minimally invasive techniques (20):**

- a) Laser Depilation.
- b) Phenolization.
- c) Fibrin glue application.
- d) Cryosurgery.
- e) Radiofrequency.
- f) Platelet-rich plasma application.

**(2)Definitive Surgical modalities in chronic pilonidal sinus (21):**

**A) Open techniques:**

- Excision of sinus tract and laying the wound open.
- Marsupialization.

**B) Closed techniques:**

- Excision and primary closure.

**C) Flap techniques:**

- i. Karydakis flap operation.
- ii. Transposition rhomboid flap operation (limberg flap or Rhomboid flap).
- iii. Z-plasty operation.
- iv. V-Y advancement flap.
- v. Gluteus maximus Myocutaneous flap.

**D) Semi-closure technique.**

Semiclosure technique is a simple, procedure. The results favor this technique in the treatment of sacrococcygeal pilonidal sinus. Lower chances of recurrence, shorter hospital stay, and time off from work with low morbidity (22).

Under spinal or general anesthesia, all patients were placed in prone position. The natal cleft shaved well. An elliptical mark about 5 cm.in length was made around the sinus. I.V. cannula was inserted inside the sinus and methylene blue dye was injected inside the sinus cavity. An elliptical incision was done around the mark, then the whole ellipse containing the the sinus tracts was excised down to the sacrococcygeal fascia, then after complete haemostasis the upper half of the wound was closed in two layers. leaving the lower half of the wound without closure as a drain to be closed by granulation tissue (second intention), (23).

Semiclosure technique is a simple, procedure. The results favor this technique in the treatment of sacrococcygeal pilonidal sinus. Lower chances of recurrence , shorter hospital stay , and time off from work with low morbidity (22). Treatment of simple pilonidal sinus with semiclosure technique has decreased operating time, short hospital stay and early healing of wound with minimal complications (24).

**Conclusion:**

For years, many surgical methods were described in its treatment, including incision with drainage, excision with healing by secondary intention, with or without marsupialization, and excision with primary closure, with or without several flaps (Karydakis, Limberg, Rhomboid). Surgeons prefer the Karydakis flap technique (KFT) due to low recurrence rates. However, postoperative hematoma, seroma, and wound infection are fundamental problems that can delay wound healing in off midline and primary closed cases.

We recommend an increase in the rate of using semi closure technique in treatment of pilonidal sinus as it has a promising results according to recurrence especially in patients with no urgent need to a faster healing operations.

Although Rhomboid flap technique shows more recurrence rate than semi closure technique throughout the short period, but it still has less recurrence rate in relation to other techniques of treatment of pilonidal sinus disease.

To decrease possibility of recurrence during the surgical management of pilonidal sinus disease, we recommend complete resection of the sinus, decreasing dead space using suction drain or vacuum, decrease flap tension in flap techniques and frequent shaving of the pilonidal cleft and good hygiene.

**No Conflict of interest.**

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