# Pilonidal sinus: minimal excision and primary closure under local anesthesia

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**Introduction**
Many surgeons treat pilonidal sinus (PNS) by wide excision, leaving a lay open or a primary sutured midline wound. Others use more sophisticated techniques such as skin flap reconstruction.

**Objectives**
The aim of the study was to determine the method of excising PNS minimally under local anesthesia and study its subsequent effects on wound closure and the healing process.

**Patients and methods**
This prospective study was carried out on 30 consecutive patients with primary nonrecurrent sacrococcygeal PNS. All patients were treated surgically with minimal excision and primary closure under local anesthesia. Parameters of follow-up included wound seroma, infection, or disruption, in addition to pain, difficulty in mobilization, time off work, and recurrence.

**Results**
The mean operative time was 38 min. Hospital stay ranged from 2 to 4 h. Healing time was 14–20 days. Three cases presented with wound seroma. One patient had a wound infection. One patient had significant wound infection and wound disruption; this patient had a recurrence after 6 months, which was treated with wide excision and rhomboid flap reconstruction.

**Conclusion**
Minimal excision and primary closure for uncomplicated cases of PNS under local anesthesia is a safe and easy operative procedure with shorter operative time, short duration of hospital stay, less postoperative time off work, low complication rates, and low chances of recurrence.

**Keywords:**
complication rates, local anesthesia, minimal excision, pilonidal sinus

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## Introduction

Pilonidal sinus (PNS) is a common pathology in general surgical practice. It accounts for almost 15% of anal suppuration. Male patients are affected more frequently than female patients by a ratio of 3 : 1. In the USA the incidence of PNS is 0.07% and is higher in the male population aged between 15 and 30 years [1].

PNS is a chronic inflammatory condition that often causes long-term disability in young adults [2].

The term 'pilonidal sinus' refers to a tract or cyst under the skin that contains loose hair. The most common are in the sacrococcygeal 'tail bone' area and the umbilicus [3].

The development of PNS was attributed by Karydakis to three main factors: the invader – that is, loose hair; the force of insertion; and the vulnerability of skin to the insertion of hair at the depth of the natal cleft. These three factors are aided by risk factors such as obesity, moisture, hairy back, prolonged sitting, and negative suction of these loose hair through a small breach in the skin, leading to inflammation and later infection [2].

Several treatment modalities have been tried for PNS, including shaving, incision and drainage, phenol application, cryosurgery, excision with packing, excision with marsupialization, excision with primary closure, and excision with flap closure [4].

The controversy in the surgical treatment for PNS surrounds the method of wound closure after excision. Many surgeons treat PNS by wide excision down to the sacral fascia, leaving a lay open or a primary sutured midline wound. Other surgeons, although still committed to the same wide excisions, use more sophisticated techniques such as various types of skin flaps designed to keep the incision away from the midline or flatten the natal cleft. Such extensive

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operations often require hospitalization, general or regional anesthesia, and variable use of stitches, drains, and antibiotics. However, in this study we are dealing with how to excise PNS minimally and the subsequent effect on wound closure and the healing process.

The ideal operation should be simple, should not require prolonged hospital stay, should involve a low recurrence rate, minimal pain, and minimal wound care, and should decrease the patient's time off work [4].

## Patients and methods

This prospective study was conducted at Department of General Surgery, Benha University Hospital after obtaining approval from local ethical committee and after fully informed written consent signed by patient. This study carried out on 30 consecutive patients with primary nonrecurrentsacrococcygeal PNS from June 2012 to May 2015 to allow a minimum follow-up period of at least 6 months for the last case operated upon.

Age, sex, presentation, number of sinus pits, midline or lateral pits, treatment, complications, inpatient stay, and postoperative outcome were recorded.

Mean age at presentation was 23.7 years (18–37 years). There were 18 male and 12 female patients.

All patients had midline pits, and only three patients had an additional lateral sinus opening due to a branched tract.

All patients were treated surgically with minimal excision and primary closure.

### Technique

All patients were subjected to a preoperative antibiotic injection (sulbactam+metronidazole). The patient was positioned in the prone position. Hair clipping was done on the table. Field preparation was done using antiseptic and sterile towels.

In this technique, the buttocks are pulled apart by means of a traction plaster on both sides to expose the natal cleft (Fig. 1).

About 20–30 cm mixture solution (prepared using 15 ml xylocaine 2% + 35 ml normal saline + 0.25 mg adrenaline to get an adrenaline concentration of 1/200 000) is used for local subcutaneous infiltration around the PNS tract (Fig. 2).

We did not inject methylene blue for sinus delineation. Instead, we depended on color contrast between the dark pilonidal cyst, due to contained hair, and the surrounding bloodless field due to the effect of adrenaline.

A small elliptical incision is created that passes through the following points: upper point 2 cm above the uppermost sinus pit, lower point 0.5 cm below the lowermost sinus pit, and right and left points 0.5 cm lateral to midline. For patients with lateral openings due to a 'branched tract', a V-cut was performed to enclose the lateral pit (Fig. 3).

The incision is deepened to about 1–1.5 cm in the subcutaneous tissue according to the obesity of the patient and then dissection is carried out medially. At this step the exact wall of the sinus tract can be identified and we can continue dissection just outside the fibrotic wall and complete the excision with overlying sinus pits (Fig. 4).

**Figure 1**

Patient position.

**Figure 2**

Local anesthetic infiltration.

If the track of PNS is accidentally opened during the dissection, it can be easily recognized by protrusion of granulation tissue. This is corrected by means of a backward step in recognizing the dissection plane and re-excision of all pathological tissue.

After completion of the excision, wound irrigation with normal saline is carried out, hemostasis is ensured, and the traction plaster is released. The wound edges will come comfortably without any tension (Fig. 5).

The wound is closed in two layers: deep dermal and skin. No drains are inserted. The wound is dressed for 48 h and then exposed (Fig. 6). We overcome the problem of anaerobic environment by early exposure of the wound. In the case of heavy buttocks we used the strategy of reversed plaster to pull the buttocks away from the cleft wound.

The patient is discharged 2–4 h after the operation and scheduled for follow-up visits at 2 days, 7 days, 14 days, 1 month, 3 months, and 6 months postoperative.

Instructions on discharge include avoidance of prolonged sitting and riding a bicycle for 6 weeks. The patient is also advised to improve local hygiene and regularly remove hair by shaving, clipping, or using depilatory creams.

Follow-up parameters include wound seroma, infection, or disruption, in addition to pain, reduced mobilization, time off work, and recurrence.

## Results

Minimal excision of PNS was performed on 30 patients, 18 men and 12 women. The mean age was 23.7 years (range 18–37 years) (Table 1).

**Figure 3**

Incision for minimal excision.

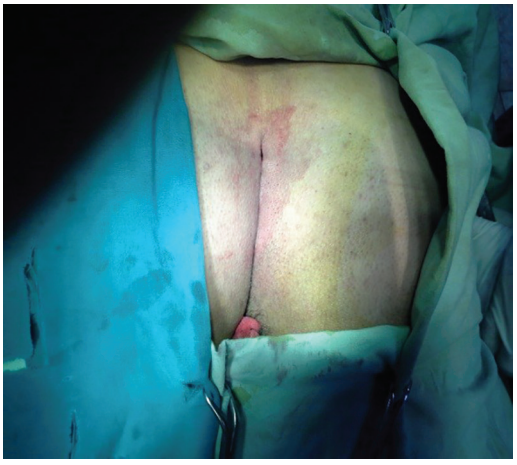
**Figure 4**

Clear dissection plane.

**Figure 5**

Resultant cavity after excision.

**Figure 6**



Wound after release of traction plaster.

As regards clinical presentation of our patients (Table 2), 23 patients (76.6%) presented with natal cleft pain, 12 patients (40%) complained of intermittent discharge, and only two patients (6.6%) gave a history of previous pilonidal abscess with surgical drainage.

The mean operative time was 38 min (range 25–47 min). The duration of hospital stay ranged from 2 to 4 h. Healing time was 14–20 days. Three cases (10%) presented with wound seroma, which was treated with repeated aspiration by means of a wide pore needle. Two patients (6.6%) presented with wound infection without disruption, which was treated with repeated dressing. One patient (3.3%) presented with significant wound infection and wound disruption. The wound was left open to heal by secondary intention and this patient presented with recurrent PNS after 6 months, which was treated with wide excision and rhomboid flap reconstruction (Table 3).

## Discussion

In 1833, Herbert Mayo described a hair-containing sinus [5], but it was not until 1880 that Hodge [6] suggested the term 'pilonidal' (Latin: *pilus* = hair and *nidus* = nest). By definition, a PNS is a sinus that contains hair, mainly in the sacrococcygeal area, and is due to favoring conditions like the existence of a deep natal cleft and the presence of hair within the cleft, sweating, maceration, bacterial contamination, and penetration of hair [4]. In addition, certain effect exerted by the movement of the buttocks encourages loose dead hair to gain entry into the sinus [7]. PNS was also branded as 'jeep disease' during the Second World War because of the high incidence among jeep drivers [8].

**Table 1 Demographic data of patients (original)**

| | | |
|---|---|---|
| Age (years) | 23.7 (18–37) | |
| Sex | 18♂ | 12♀ |

**Table 2 Clinical data of patients (original)**

| Clinical presentation | *n* (%) |
|---|---|
| Pain | 23 (76.6) |
| Discharge | 12 (40) |
| Previous abscess | 2 (6.6) |

**Table 3 Postoperative data (original)**

| | |
|---|---|
| Operative time | 38 min (25–47 min) |
| Hospital stay | 2–4 h |
| Healing time | 15 days (14–20 days) |
| Wound seroma | 3 cases (10%) |
| Infection | 2 cases (6.6%) |
| Disruption | 1 case (3.3%) |
| Recurrence | 1 case (3.3%) |

Management of PNS varies widely, from nonradical treatment like gluteal shaving and incision and drainage to radical treatment in the form of wide local excision only or followed by different methods of reconstruction.

Although many surgical and nonsurgical treatment methods have been described, the ideal treatment method has not yet been established for pilonidal disease [9].

The ideal surgical technique for the treatment of PNS should involve minimal financial cost, allow patients to return earlier to work, be simple to perform, not require a prolonged hospital stay, inflict minimal pain, and have a low disease recurrence rate [10].

The controversy in PNS management surrounds wound management after wide local excision. Wide local excision creates a big defect, which if closed primarily will be under tension. This tension in the wound will cause ischemia and pain and will be complicated by infection and later wound disruption. Previous work considered the groove of a natal cleft to be one of the predisposing factors for the development of PNS and paid every effort to obliterate it or make an off-midline incision. The principles of flap reconstruction after wide local excision are used for elimination of tissue tension and obliteration of the natal cleft groove but can still be considered a complex operation that should be preserved for complex cases.

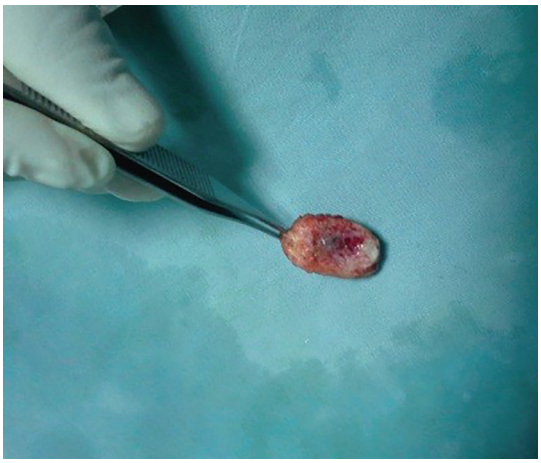
In wide local excision, the surgeon creates a big defect without additional benefits and then tries to find a way to close it. Primary closure will put tissues under tension and flap reconstruction will obliterate the natal cleft, which is a normal anatomy.

In this study we tried to look at PNS operations from a different perspective. We tried to make it simple and an office operation and focused on how to excise PNS minimally.

The technique for minimal excision of PNS is based on two main principles for PNS treatment: the elimination of tissue tension and the complete excision of diseased tissue.

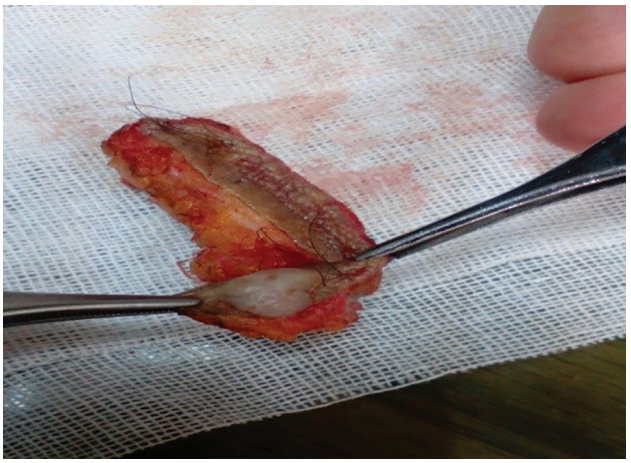
Other advantages of this technique are preservation of healthy tissues and that, being a simple procedure, it can be done under local anesthesia. This simplicity makes it an office procedure with minimal morbidity. Moreover, this procedure does not interfere with healing time or increase complications such as wound seroma, infection, and disruption.

**Figure 7**



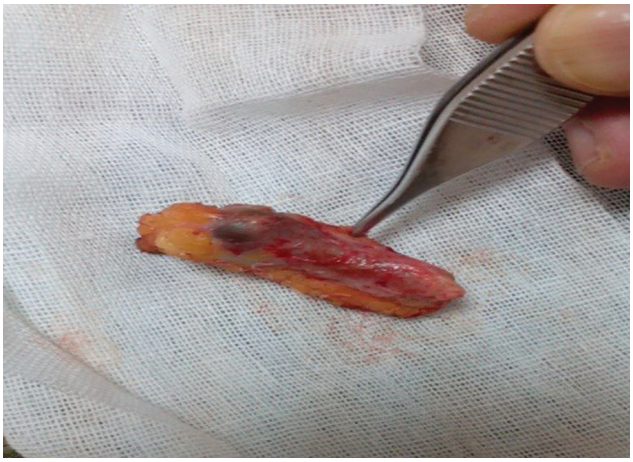
The completely excised sinus.

**Figure 8**



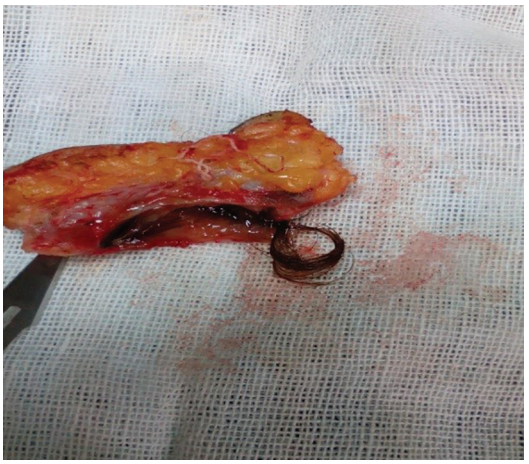
Pilonidal sinus (PNS) with lateral opening.

**Figure 9**



The excised long tract with clear color contrast.

**Figure 10**



Opened sinus containing hair coils.

In this study we encountered 10% wound seroma cases and 6.6% wound infection and disruption cases. Only one patient (3.3%) presented with recurrent PNS after 6 months and this condition was treated with wide excision and rhomboid flap reconstruction.

Recurrence has been consistently reported to be low (1–4%) [11–13] with the Karydakis technique even with prolonged follow-up as compared with other treatment modalities, especially simple drainage (25%) [14], open excision (0.5–5%) [15,16], simple midline closure (3.5–4.2%) [15,17], and Bascom's cleft excision (10%) [18,19].

This study is considered a preliminary study for this new technique; moreover, the number of patients was relatively small. This recurrence rate can be validated through further studies.

Here, we introduce a simple, fast technique for minimal excision, which can be considered a form of radical treatment for PNS as we excise all pathological tissue and preserve healthy tissue (Figs 7–10).

## Conclusion

Minimal excision and primary closure for uncomplicated cases of PNS under local anesthesia is a safe and easy operative procedure. It has been found to result in shorter operative time, shorter length of hospital stay, less postoperative time off work, less healing time, low complication rates, with low chances of recurrence. Complicated and recurrent sinuses require wider excision and flap reconstruction.

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### Conflicts of interest

There are no conflicts of interest.

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