Malaysian Journal of Medicine and Health Sciences Vol. 5(2) June 2009: 69–77

Case Study

Pilonidal Sinus: Why Does it Recur

AH Rahoma
Faculty of Medicine, Universiti Teknologi MARA
40450 Shah Alam, Selangor, Malaysia

ABSTRACT

Introduction: A pilonidal sinus (PNS) is an infected tract at the natal cleft under the skin between the buttocks. It is a common problem in primary care due to the high recurrence following surgery. The patient treated here had a recurrent pilonidal sinus after three previous surgeries. **Methods**: The patient was operated by excision of the tract and closure of the wound. **Results**: The wound healed in two stages as explained in the study. **Conclusion**:The possible reason for recurrence was detected and it was managed. Healing was complete and follow up after one year revealed no recurrence.

Keywords: Recurrent pilonidal sinus, surgery and prevention

INTRODUCTION

Pilonidal means a 'nest of hairs'.[1] A sinus tract is an abnormal tract (like a narrow tunnel) in the body. A sinus tract typically goes between a focus of infection in deeper tissues to the skin surface. The tract may discharge pus from time to time onto the skin.[2] It commonly contains hair debris and granulation tissue without endothelium and runs under the skin between the buttocks (the natal cleft) a short distance above the anus. It appears in a vertical direction and rarely occurs in other sites of the body and may open by one or more sinuses.[2-5] Pilonidal sinus is common in primary care centres due to its high recurrence rate after surgery and the need for frequent and time-consuming wound care.[2]

THE CASE

A 29-years-old male presented with a recurrent pilonidal sinus following multiple previous operations. He was operated in his country twice and once again in Kuala Lumpur. The sinus was situated in the natal cleft with two openings; one was 2 cm behind the anal opening and the other was in a higher plane, 15 cm away from the anal opening. This may be considered a fistula as it had two openings. The tract did not stop growing and extended to have a higher opening. Old suture marks were found surrounding the upper end with unhealthy scarring (Figures 1 & 2).

Corresponding author: Assoc Prof Dr Ahmed Hussein Rahoma
Email: *ahmedhusseinr@yahoo.com; ahmedhussein@salam.uitm.edu.my; ahmedrahoma@esprs.com*

METHODS

The patient was operated by excising the tract and the scarred skin with an elliptical incision. The tract had two openings, one above and one below in the natal cleft. The tract was filled with a granulation tissue with some hair tuft.

After excision of the tract and removal of the contents in block, the two wound edges were approximated and closed with Vicryl 1 and skin was closed by Nylon 3/0. The skin was left partially open in its upper part to heal spontaneously.

Post-operatively, the patient was instructed to sleep in a prone position for few days. Five sessions of hyperbaric oxygen were given. Povidone iodine was used frequently for cleaning during dressing. Skin sutures were removed one week after surgery.

RESULTS

The sinus healed completely in one month after surgery. The healing process passed into two stages. Within three weeks after surgery, the surrounding hairs were seen to be imbedded into the lower end of the incision line starting to cause an early recurrence. (Figure 3) The hairs were shaved around the natal cleft. One week after, the wound was seen completely healed (Figure 4). The patient was advised to shave the hair almost every week. One year later, there was no recurrence and healing was completely sound (Figure 5).

DISCUSSION

The incidence of PNS is rare both before puberty and after the age of 40. Males are affected more frequently than females, probably due to their hairy nature and obesity. [6,7] Incidence of PNS in males is 1.1%, which is ten times more than in females.[2,3,6] It is more common in Caucasians than Asians or Africans due to different hair characteristics and growth patterns. [4,5,8]

Risk factors were shown to be high in those with sedentary occupation (45%), positive family history (37%), obesity (50%) and local irritation or trauma prior to onset of symptoms (34%). [2,7,8] The disease can be complicated later by squamous cell carcinoma.[9]

Pathogenesis

Theory 1: A minor congenital or hereditary abnormality in the skin of the natal cleft tends to run in some families. Part of the abnormality in this skin may cause the hair to grow into the skin rather than outwards.[2,10]

Theory 2: Hair is forced to grow in an abnormal direction by pressure or trauma.[2,10]

Author Hypothesis

It is initiated by lack of cleaning of this moist area with minor trauma that may start by itching and scratching. Scratching leads to a minor wound or development of skin ulceration due to a small boil or furuncle and the long hairs around are forced to grow in making a tract of granulation tissue.

Suggested predisposing factors include hormones, hair, friction and infection. Sex hormones are produced at puberty and seem to affect the pilosebaceous glands.[6] Pilonidal disease is associated with visible pits in the midline of the natal cleft, which have the

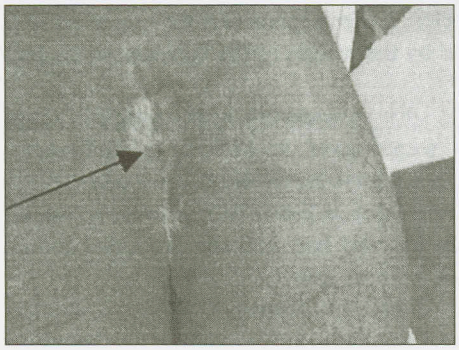

Figure 1. The upper end of the tract is shown by the arrow

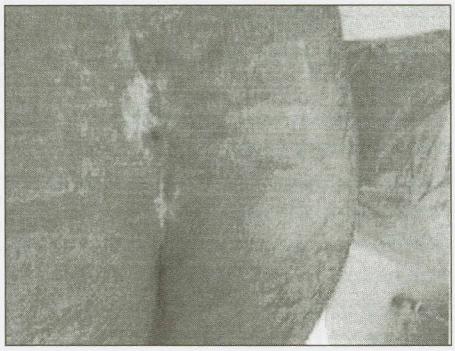

Figure 2. Another end to the tract in the lower part of the cleft

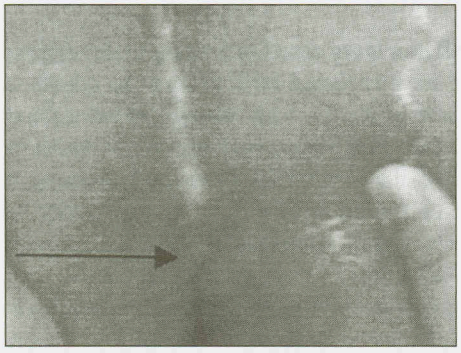

Figure 3. Two to three weeks post-operatively, a new opening lower down caused by surrounding long hairs

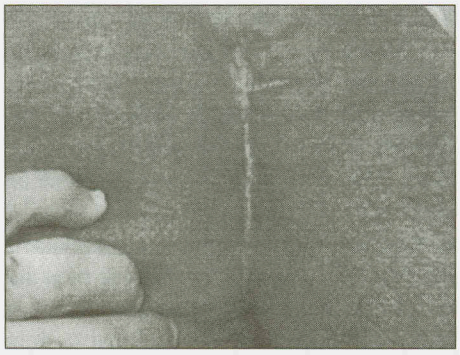

Figure 4. Complete healing is seen one week after hair shaving

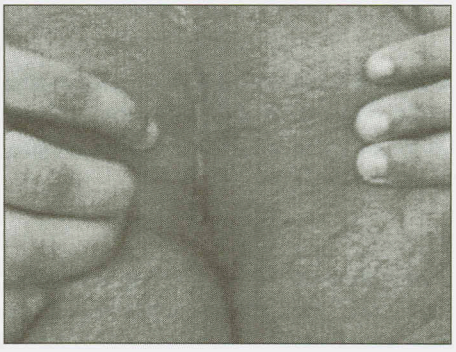

Figure 5. Complete healing of the sinus is seen with no recurrence after one year

microscopic appearance of enlarged hair follicles. The enlargement is thought to occur due to stretching of the follicular openings caused by the weight of the buttocks being pulled by gravity.[11]

This force may be amplified by activities such as bouncing while upright, slumping while seated or bouncing on a hard seat as in 'jeep disease'. If the force applied reaches a critical level then the base of the follicle ruptures as this is the weakest part at which the skin is tethered to the subcutaneous tissue. The same forces, together with friction between the buttocks, are also responsible for sucking keratin and hair into the distended follicles, which leads to infection of the follicle and abscess formation.

It was believed that hair follicles alone were the source of pilonidal disease.[7] Histopathology of specimens following wide excision has shown that the hairs penetrating into the dermis were the free ends of hairs not follicles.[8]

Furthermore, hair entry to the follicles by a variety of means was originally thought to be the primary event in the development of the disease. However, there is evidence to suggest that the enlargement of the follicles precedes hair gaining access and on operation, hair is found in only half of the cases.[7]

Hair acts as a foreign body causing an inflammatory reaction leading to development of chronic pilonidal disease. Distension of the obstructed follicle leads to edema and inflammation resulting in occlusion of the mouth of the pit, with subsequent infection and abscess formation in the subcutaneous fatty tissue (the patient may present at this stage). Over time, a chronic abscess develops and it is the formation of the track draining this abscess cavity that is known as a sinus. The combination of a deep abscess cavity with surrounding moist conditions and abundant bacteria, hair, debris and friction cause recurrent infection, associated with chronic pain and discharge.

Malignant change is a relatively rare complication of pilonidal disease, but evidence of at least 50 such cases is available in published medical literature. The most common is squamous cell carcinoma arising after decades of recurrence of pilonidal disease.[9]

Anaerobic bacteria as *Bacteroides* and *Escherichia coli* predominate over aerobic bacteria such as *Staphylococci* and *Haemolytic streptococci* in abscess formation. Anaerobes are predominantly responsible for reinfection and subsequent wound breakdown following surgery.[10]

Clinical Presentation

A pilonidal sinus may be asymptomatic for some time prior to presentation. The majority of patients only present with the onset of symptoms, usually pain and discharge. Symptomatic disease usually presents as an acute pilonidal abscess, a chronic pilonidal abscess or complex/recurrent pilonidal disease.[11]

Acute Pilonidal Abscess

The patient notices increasing discomfort and swelling over a number of days and the pain may be severe by the time of presentation. On examination, a localised fluctuant swelling in the midline of the natal cleft with overlying cellulites will be visible. The area is exquisitely painful to touch and often simply the act of separating the buttocks to examine the area is intolerable for the patient.[2,3]

Chronic Pilonidal Disease

It is common for patients to present with chronic pain and discharge, often with a history of up to two years.[2,10] On examination, a single, or occasionally, multiple sinuses may be seen. Tufts of hair or other debris, such as clothing fibers, are often visible arising from the sinus. Localised edema, swelling and inflammation may be present masking the underlying sinus.

Treatment Methods

Treatment depends upon the nature of presentation and the attitude of patients. Regardless of type of treatment selected, the aims remain similar as it must be explained to the patient in terms of discomfort, complications and recurrence. Complications and recurrence should be minimal and the patient should be able to resume work and normal social activities as early as possible.[13,14]

Conservative management: For the acute abscess that presents early, broad spectrum antibiotics and depilation alone may be sufficient to resolve the immediate problem. If symptoms resolve, follow-up examination for the presence of pits or sinus tract is recommended. Chronic disease can be successfully treated by shaving and meticulous hygiene, but recurrence rates are unknown.[15]

*Phenol injection:*This is a closed technique under local anesthesia where injection of phenol into a sinus causes sclerosis and gradual closure. [12] The procedure is time consuming, needs repeated injections, has a high recurrence rate and has been largely replaced by operative techniques.

Surgery

The global management of a pilonidal abscess is simple incision and drainage. Surgical management of chronic and recurrent sinus is always mandatory. The majority of procedures can be classified in four categories as incision and drainage or excision and healing by secondary intention or excision and primary closure and finally excision with reconstructive flap techniques.

Incision and drainage: This is a simple procedure that involves making an elliptical incision in the abscess, just off the midline. Curettage to remove dead or infected tissue in the wound improves the rate of healing, with 90% completely healed at one month, compared to just 58% healed at 10 weeks in the absence of curettage.[15]

Following a single incision and drainage procedure, 40-60% will go on to develop a PNS requiring further surgery. Pits or sinuses can be excised as part of an incision and drainage procedure, but these can be obscured by edema and are often overlooked at the initial assessment.[7] The recurrence rate can be reduced to about 15% if a second procedure to excise pits and sinuses is performed after five to seven days.[16]

Healing by secondary intention has the advantage of allowing free drainage of infected material and debris. However, the patient requires regular wound care and relief of the discomfort of packing until the wound has closed. In a retrospective study, mean number of

days off work following incision and drainage was 20 (twenty days). [16] For chronic cases with established tracts, the only treatment is surgery.

Wide excision of an elliptical wedge of skin and subcutaneous tissue down to the pre-sacral fascia is designed to remove all the inflamed tissue and debris allowing the wound to granulate from its base. The procedure necessitates general anesthesia and hospital stay for a few days post-operatively.

The main advantage is the low recurrence rate but it needs a long healing time (8-10 weeks)[15] and high direct and indirect costs associated with inpatient care and follow-up wound care. Despite this, there is a role for wide excision in those with extensive chronic disease and following failed primary closure. A modification of the standard excision is 'marsupialisation'. The skin edges are not excised, but are sutured to the sides of the wound. The mean healing time in 125 patients who underwent this procedure was shown to be four weeks with a recurrence rate of 6%.[16]

Excision and primary closure: Closure of the wound is more cosmetically acceptable for some patients and is associated with a shorter healing time and time off work. However, this potential benefit is offset by the need for bed rest for up to one week in hospital[16] coupled with a higher risk of post-operative infection.

When infection intervenes, the wound must be laid open and healing time is longer than if the wound had been treated by secondary intention in the first place. The scar can be sited over the midline or displaced laterally with one year recurrence rates of 18% and 10% respectively.[5] A recent prospective study showed failure of primary healing was significantly associated with early recurrence of the disease. In the same study, the use of pre-operative antibiotics did not influence the recurrence rate.[16]

Bascom has proposed a method to incise, drain and curette a chronic abscess through a lateral incision combined with excision of any midline pits with a minimal amount of surrounding tissue.[18] A section of the wall of the abscess cavity opposite the incision is raised as a flap and used to close the communication between the midline pits and the abscess cavity. This is accomplished by suturing the flap to the underside of the skin bridge formed between the incision and the midline. In a recent study of 218 patients treated with Bascom's procedure as day cases, 6% developed a post-operative abscess requiring drainage and 10% had recurrence requiring further surgery with a mean follow up of 12.1 months (range 1-60 months).[18]

Excision with reconstructive procedures: These procedures are more technically demanding and are probably best performed by a plastic surgeon. Their use is generally restricted to recurrent complex pilonidal disease. The theory behind the majority of procedures is to reshape and flatten the natal cleft to reduce friction, local warmth, and moisture and hair accumulation. One of the essential reasons for success of the treatment and prevention of recurrence is to find out and remove the tract completely.[17] Karydakis pioneered a procedure of raising a flap to overlap the midline with the scar sited to one side to reduce post-operative hair entry.[19] Alternative techniques use a flap of both skin and muscle or a Z-plasty flap to close the defect following excision.[20,21]

All these techniques require general anesthesia and a week or more of bed rest in hospital.

Following incision and drainage or excision procedures, the wound should be packed with sterile dressing with foam dressing to keep the wound open preventing premature closure of the wound edges. Hair and any debris should be removed at every wound inspection and the natal cleft should be kept hair-free by weekly shaving or use of depilatory agents. Depilation is usually continued until wound healing, although the authors would recommend this practice continued long term or at least until the patient reaches his late thirties when recurrence is unlikely. [22]

Is there a role for hyperbaric oxygen? Up to this moment I believe that it facilitates and promotes healing. A number of studies are ongoing to confirm this issue.

Recurrence

Recurrence can be divided into two groups: early and late. Early recurrence is usually due to failure to identify one or more sinuses at incision and drainage, which was not followed by a second-look procedure. Late recurrence is usually due to secondary infection caused by residual hair or debris that were not removed at operation, inadequate wound care or insufficient attention to depilation.[23,24] Recurrence in chronic pilonidal sinus excision is due to incomplete excision of the tract.

The case treated here had recurrence after three previous surgeries which failed to achieve complete cure. The only solution was surgery. The author observed that healing occurred in two phases. One phase was immediately after surgery over three weeks where he observed a small wound at the lower end of the suture line. The author has seen embedded hair in the small wound with a tendency for recurrence. The second phase started when the author shaved all the hairs around the wound and within one week, the wound was completely healed.

In this case, the recurrence was due to the presence of long hairs. There may be several other reasons for recurrence, which may need further studies.

CONCLUSION

Complete excision of the tract is the main step for treating pilonidal sinus. Hair removal is a complementary step to ensure cure. Cleaning is mandatory for effective closure of the pilonidal sinus. Cleaning prevents infection and stops the itching sensation and initiation of wounds. The main cause of recurrence is presence of long hairs surrounding the operative site. Hair shaving allows good and sound healing helped by rest and weight reduction before surgery and prone position of the patient after surgery. In this case, a closed technique might hasten the healing process without recurrence.

REFERENCES

[1] Hodges RM. Pilonidal sinus. Boston Medical Surgical Journal 1880; 103: 485-586.

[2] Sondenaa K, Nesvik I, Anderson E, Natas O, Soreide JA. Patient characteristics and symptoms in chronic pilonidal sinus disease. International Journal of Colorectal Disease 1995; 10(1): 39-42.

[3] Dwight RW, Maloy JK. Pilonidal sinus: experience with 449 cases. New England Journal of Medicine 1953; 249: 926-30.

[4] Buie LA, Curtis PD. Pilonidal disease. Surgery Clinics of North America 1952; 32: 1247-59.

[5] Berry DP. Pilonidal sinus disease. Journal of Wound Care 1992; 1(3): 29-32.

[6] Price ML, Griffiths WAD. Normal body hair: a review. Clincal & Experimental Dermatology 1985; 10: 87-97.

[7] Cubukcu A, Gonullu NN, Poksoy M *et al.* The role of obesity on the recurrence of pilonidal sinus disease in patients who were treated by excision and Limberg flap transposition; International Journal of Colorectal Disease 2000 ;15: 173-175

[8] Jones DJ. ABC of colorectal diseases. Pilonidal sinus. British Medical Journal 1992; 305: 410-12.

[9] Trent JT, Kirsner RS. Wounds and malignancy. Advances in Skin & Wound Care 2003; 16(1): 31-34.

[10] Solla JA, Rothenberger DA. Chronic pilonidal disease. An assessment of 150 cases. Diseases of the Colon & Rectum 1990; 33(9): 758-61.

[11] Hodgkin W. Pilonidal sinus disease. Journal of Wound Care 1998; 7(9): 481-83.

[12] Stansby G, Greatorex R. Phenol treatment of pilonidal sinus of the natal cleft. British Journal of Surgery 1989; 76(7): 729-30.

[13] Bissett IP, Isbister WH. The management of patients with pilonidal disease: a comparative study. Australian/New Zealand Journal of Surgery 1987; 57(12): 939-42.

[14] Marks J, Harding KG, Hughes LE, Riberio CD. Pilonidal sinus excision: healing by open granulation. British Journal of Surgery 1985; 72(8): 637-40.

[15] Kronberg I, Christensen KI, Zimmerman-Nielson O. Chronic pilonidal disease: randomized trials with complete three year follow up. British Journal of Surgery 1986; 72: 303-04.

[16] Sondenaa K, Diab R, Nesvik I *et al.* Influence of failure of primary wound healing on subsequent recurrence of pilonidal sinus. European Journal of Surgery 2002; 168(11): 614-18.

[17] Allen-Marsh TG. Pilonidal sinus: finding the right track for treatment. British Journal of Surgery 1990; 77: 123-32.

[18] Senapati A, Cripps NP, Thompson MR, Franzini DA. Bascom's operation in the day-surgical management of symptomatic pilonidal sinus. British Journal of Surgery 2000; 87: 1067-70.

[19] Karydakis GE. New approach to the problem of pilonidal sinus. Lancet 1973; 2: 1414-15.

[20] Bai JC. Treatment of pilonidal sinus: how best to prevent recurrence. Bombay Hospital Journal 2008; 50(3):

[21] Ezzedien Rabie M, Abdullah AA R, Abdullah A H, Saleh H *et al.* Sacrococcygeal pilonidal sisease: sinotomy versus excisional surgery. A retrospective study. ANZ Journal of Surgery 2007; 77 (3): 177 – 180

[22] Holm J, Hutten L. Simple primary closure for pilonidal sinus. Acta Chirurgica Scandinavica 1970; 3: 1136-537

[23] Lineaweaver WC, Brunson MB, Smith JF, Franzini DA, Rumley TO. Squamous carcinoma arising in a pilonidal sinus. Journal of Surgical Oncology 1984; 27(4): 39-42.

[24] Bascom JU. Pilonidal disease: correcting over treatment and under treatment. Contemporary Surgery 1981; 18: 13-28.