Pilonidal Disease

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Peter Dawson

8.1 Introduction

In 1990 T.G. Allen Mersh wrote a seminal review in the *British Journal of Surgery* entitled "Pilonidal Sinus: Finding the Right Track for Treatment" [1]. Little has changed since that time, nor has knowledge significantly advanced in the understanding or treatment of this common condition, which affects 26 per 100,000 population [2]. This chapter presents an update and suggests where the future may lie in achieving a simple, effective strategy/algorithm for clinicians to follow in the treatment of this disease.

8.2 Etiology

The etiology of pilonidal disease (PD) (*pilus* = hair, *nidus* = nest) (Fig. 8.1) is unclear, although it is probably an acquired disease originating within a natal cleft follicle that becomes distended with keratin. The distended follicle becomes inflamed and obstructed as a result of edema, eventually rupturing into the subcutaneous fat. In addition to the midline pits, the characteristics of the early stages of PD are a result of marked hyperkeratosis of the enlarged hair follicle ostium. These features, together with moisture – especially in this area – make the skin susceptible to the penetration of shed hair shafts.

Work by Karydakis [3] with 6,000 patients suggests that loose hairs "impale" normal tissue inducing, a foreign body reaction. He devised a pathogenic formula involving three variables, namely, loose hair (*H*), force (*F*), and the vulnerability (*V*) of local skin and tissues. In this model the primary sinuses represent hair entry sites and secondary sinuses represent exit points, such that Pilonidal disease = $H \times F \times V^2$.

The most common site of occurrence is the sacrococcygeal region. Rarer sites include the interdigital cleft, the breast, and the umbilicus [4]. Not uncommonly (20 %), PD occurs with hidradenitis suppurativa (acne inversa) [5], sharing the same pathological process, that is, an occluding follicular hyperkeratosis followed by a dissecting cellulitis and the formation of draining sinuses (Fig. 8.2). In addition, friction between the buttocks may be responsible for sucking or sticking hairs into the pits. The stiffness of body hair and hair scales functioning as microbarbs facilitate the penetration of hair shafts deeper into the skin. Hair acts as a potent foreign body, causing a prolonged inflammatory reaction and the development of sinus tracts filled with granulated tissue and often

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Fig. 8.1 Uncomplicated pilonidal sinus disease with multiple midline pits

Fig. 8.2 Pilonidal sinus and hidradenitis suppurativa (acne inversa)

with masses of hair shafts. By this time these tracts are always at least partially lined by epithelium.

The risk factors for the development of symptomatic PD are listed in Table 8.1.

Table 8.1 Risk factors for pilonidal disease

A deep natal cleft [6]
Family history
Hirsute individuals
Young individuals
Obesity
Long-standing pressure or friction
Inadequate personal hygiene
Occupation ("Jeep disease") [7]

8.3 Incidence

PD most commonly occurs in the second and third decades of life, and it is twice as common among men than women. The incidence is highest among Caucasians. An estimated 1.1 % of male students and 0.11 % of female students suffer from PD [8]. PD is rare after the age of 40 years, suggesting an association with sex hormones, which can affect pilosebaceous glands.

8.4 Clinical Presentation and Diagnosis

PD is clinically diagnosed by visible single or a series of midline pits in the natal cleft that have the microscopic appearance of enlarged hair openings. Often these pits are minute, whereas others may contain a tuft of hairs. The clinical picture of a developing acute abscess maybe inconspicuous, presenting as a slight bulging of the skin in the natal cleft. Recurrent painful indurations in this area with purulent secretion followed by silent periods are characteristic of PD. These often settle down with antibiotic treatment but almost always recur later.

Chronic PD may reveal a lateral track in the upper parts of the buttocks filled with granulation tissue resembling pyogenic granuloma. The differential diagnosis may include fistula in ano, hidradenitis, and, rarely, perforating diverticular disease [9].

In selected cases computed tomography or magnetic resonance imaging (MRI) may be indicated. The latter is particularly useful to exclude fistula in ano or to clarify obscure presentations [10] (Fig. 8.3).

8.5 Therapy

The management of PD is variable, debateable, and occasionally difficult. The principles of treatment are eradication of the sinus tract and complete healing of the epidermis with no recurrence. Ideal treatment should be quick, allowing these

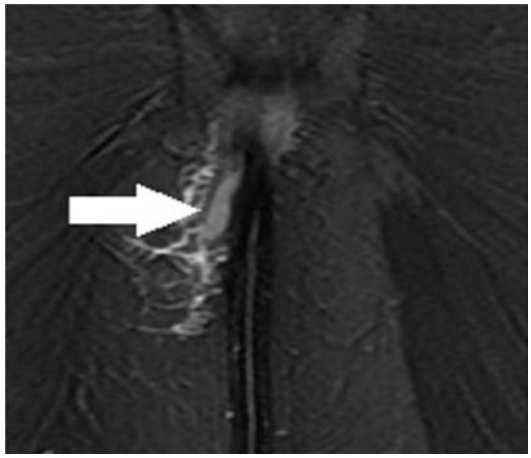

Fig. 8.3 Magnetic resonance imaging of a pilonidal sinus and track (*arrow*) (Courtesy of Dr. D. Blunt)

young patients to return early to normal activity and work, with minimal complication.

8.6 Nonoperative Treatment

Asymptomatic PD may be treated conservatively by meticulous hair control (shaving the natal cleft), improved hygiene, and mechanical removal of shed hairs [11]. Laser removal of hair in the natal cleft is increasingly popular [12]. Evidence that conservative treatment of symptomatic PD is effective is limited; therefore the mainstay of treatment is surgical. Antibiotics may be indicated in purulent stages of PD before surgery or in rare cases of systemic infection. Prophylactic use of antibiotics in the surgical treatment of PD remains unproven [13].

8.7 Surgical Treatment

Several techniques are described. Recurrence rates are variable with all procedures and may reach 20% or more. Postoperative professional wound care and hair control are important for optimal wound healing and are likely to play an important role in avoiding complications and recurrences. The main therapeutic goals are set out in Table 8.2.

Table 8.2 Therapeutic goals

Flatten the natal grove
Low rate of complications and recurrences
Minimal discomfort for the patient
Short healing and little time off work
Good cosmetic results
Suitable for a day-case operation

8.8 Pilonidal Abscess

Pilonidal abscess (which occurs in half of all cases of PD) should be drained or deroofed to provide optimal drainage. This rapidly alleviates symptoms and can control PD in the outpatient setting. General anesthesia allows curettage of the sinus in the same session and, together with removal of the pits, occasionally may heal PD, but recurrences often occur [1, 14].

8.9 Chronic Pilonidal Disease

8.9.1 Minimal Surgery

Brushing or phenolization of the track produces similar results to laying the track open [15]. While this technique may be useful, the lack of randomized studies results in weak evidence. Expert nursing, dressing, and careful shaving of the area are required and are often not freely available.

8.9.2 Open Surgery

Wide excision of all involved skin with shallow resection margins and open granulation remains a common surgical treatment for the majority of patients (Fig. 8.4). Short hospitalizations (approximately 2 days) often are unavoidable. Leaving the wound open results in longer healing periods and requires repeated visits by a community nurse with the associated costs of time and dressing. While the longer healing time is not an obstacle to patients' early return to work and social activities, it is a great inconvenience. Some wounds may take up to a year to heal and yet still recur. Shorter healing times can be achieved using the lay-open technique, modified with marsupialization [16]. The

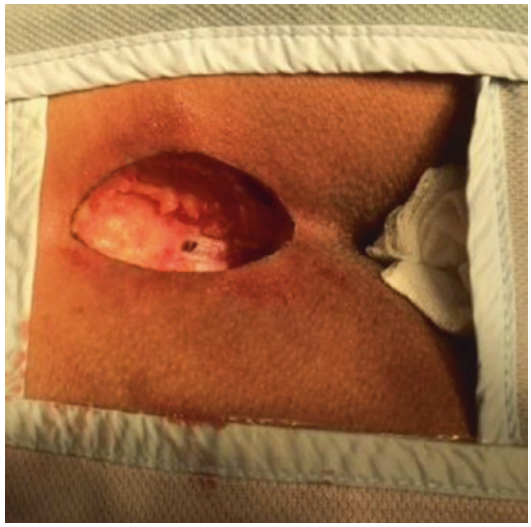

Fig. 8.4 Wide local excision

use of mobile vacuum-assisted closure therapy may facilitate healing by secondary intention.

8.9.3 Wound Closure Procedures

Wound closure methods offer the potential advantages of shorter stays, day-case procedures, quicker healing, and less time off work. The disadvantages are a higher rate of complications and recurrences with inferior cosmetic results when wound closure is achieved using flaps [17].

The following methods of wound closure are most used:

- Simple excision of the sinus complex with primary closure in the midline. This procedure is frequently complicated by wound breakdown caused by hematoma formation.
- Better results are reported for oblique and asymmetric excisions and closure techniques to minimize or to avoid midline sutures. The latter procedures can be combined with an advancement flap to facilitate wound closure and to create a flattened anal cleft [5].
- The Bascom I technique conservatively excises midline pits with hair and debris. The infected epithelialized pits are removed while the extent of the midline wound is minimized. Senapati et al. [18] reviewed 200 patients with a 90 % success rate at 1 year.

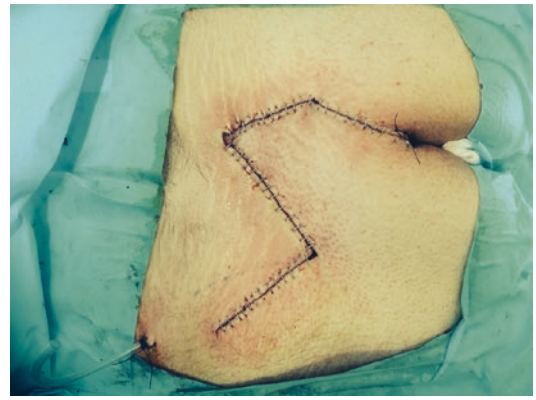

Fig. 8.5 Final appearance of a rhomboid excision and Limberg flap procedure (Kieninger G et al.)

- The Karyadakis technique is an advancing flap operation where a "semilateral" incision is made around the sinus down to the presacral fascia. The subcutaneous flap is mobilized and sutured to the opposite side, effectively placing the suture line away from the midline [5].
- A tension-free wound closure can be achieved by plastic flaps such as the Limberg flap (Fig. 8.5; also rotational, rhomboid advancement flaps and Z-plasty), but the goal to attenuate the natal groove is fulfilled only in the upper part; the lower part of the cleft remains deep, sometimes bulging under the flap, and recurrences are possible [19]. Flap techniques have a higher complication rate and the cosmetic results are often poor compared with the other techniques. Their use in female patients should be considered carefully. Further research is needed to compare flaps with off-midline repairs [20]. Therefore plastic flaps should be reserved for complicated cases, such as in the malignant transformation of PD or recurrent/extensive disease.
- Fibrin glue techniques are being increasingly used, although the recurrence rate remains at 20 % [21].

8.9.4 Complications of Surgery

Early bridging is not an uncommon complication in an open wound with secondary healing and is a result of inadequate wound packing. Wounds may fail to heal for unknown reasons, even under

optimal wound care conditions; however, many recurrences may be prevented by assiduous wound management.

Conclusions

Primary closure techniques provide for quicker healing but have higher recurrence rates compared with laying the wound open [17]. There are no differences in surgical site infection rates between the two methods. Off-midline closure has better healing rates compared with midline closure, whereas fewer recurrences occur with open healing compared with midline closure.

Systematic reviews of each surgical treatment of PD are prone to bias because blinding patients, surgeons, and assessors is not possible. Many minor small variations in technique occur, adding to the great divergence of published results and in the understanding of the pathogenesis of PD. In addition, many trials of treatment are small and at risk of failing to detect clinically relevant differences. Standardizing each method, which should be done only by well-trained operators, will further optimize results. Meanwhile, the literature suggests a trend away from wide excision and leaving wounds to heal by secondary intention toward less invasive procedures [22].

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