

SUGGESTED READINGS

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THE MANAGEMENT OF PILONIDAL DISEASE

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PILONIDAL DISEASE: COMMON AND CHALLENGING

Pilonidal disease is a common, acquired chronic infection of the skin and subcutaneous tissue overlying the sacrum and coccyx with an incidence of approximately 25 per 100,000. It typically affects people in their teens, 20s, and 30s. The disease rarely first becomes symptomatic after age 40. Men are affected at rates two to three times more frequent than those of women. The disease can manifest acutely, or individuals can live with intermittent symptoms for many years. In its most severe form, pilonidal disease can be severely debilitating, causing daily discomfort and limiting activity. Because pilonidal disease affects people in their most productive years, the socioeconomic effect of the disease is great because affected patients spend significant time away from school or work.

Pilonidal disease was originally described by Herbert Mayo in 1833 and initially thought to be of congenital origin. Unacceptably high recurrences despite seemingly adequate surgical interventions however, support the acquired as opposed to the congenital theory of etiology.

Pilonidal disease first gained public attention during World War II when more than 78,000 soldiers with this condition were admitted to U.S. Army hospitals for an average of 55 days. Surgical outcomes were so poor on these individuals that the U.S. military essentially banned further surgical procedures for this disease.

Pilonidal disease continues to be greatly misunderstood, and rates of recurrence and morbidity from traditional surgical approaches are unacceptably high. Because of this, the surgical treatment of pilonidal disease must change. Nonoperative treatment has gained popularity, but there is little evidence that nonsurgical treatments can cure significant pilonidal disease. More contemporary operations involving flaps and off-midline closure are gaining popularity among surgeons willing to move beyond surgical tradition. These more complex procedures may be performed in an outpatient setting, require minimal absence of patients from work or athletics, and have much lower recurrence rates than do conventional excisional procedures. Because many general and colon and rectal surgeons have limited experience with reconstructive procedures involving flaps, few have performed these rigorous but arguably superior operations. Asymmetric flap procedures should become the new norm for the treatment of advanced or recurrent pilonidal disease.

Because most recommendations regarding the treatment of this disease are derived from expert opinion or case report studies, the best treatment of pilonidal disease remains controversial.

ETIOLOGY AND CHARACTERISTICS

The Name

Pilonidal disease is an acquired condition of the natal cleft (Figure 1). There are two important ingredients in the development of pilonidal disease: a deep cleft and hair. The term *pilonidal* comes from the Latin *pilus*, meaning “hair,” and *nidus*, meaning “nest.” Most pilonidal abscesses contain hairs. Hairs that are shed from the scalp or back fall into and become lodged in an unusually deep cleft near the tailbone. The hairs in pilonidal abscesses are not ingrown. Hairs and debris are secondary invaders and not the cause of the condition. The shed hairs insert from their root end because barbs prevent them from inserting from their external apex. Local hair removal or eradication is therefore not preventive or curative.

Causes

Pilonidal disease most commonly occurs in hirsute individuals with deep natal clefts. The environment inherent in a deep natal cleft is the true cause of pilonidal disease. The cycle begins when an individual with a deep cleft sits. The stretch of the sitting motion ruptures hair follicles in the midline, and they become plugged with keratin. This follicular occlusive process is similar to what occurs in hidradenitis suppurativa. A subcutaneous abscess then develops. The moist, anaerobic nature of the cleft prevents healing, and a dilated pore or pit opens in the midline (Figure 2). Further sitting motions cause the skin of the cleft to tighten and lift off the sacrococcygeal fascia, which creates a suction force that pulls hair and debris through the holes, causing enlargement of the subcutaneous abscess. A foreign body reaction develops and contributes to the formation of pus and inflammation.

In the body’s attempt to expel the infection, a secondary sinus may track to the cephalad aspect of the natal cleft (Figure 3). Such a secondary external opening is the result and not the cause of the disease, even though it may seem more impressive than the more anally located dilated pores. These pores, termed the *primary openings*, are the true source of pilonidal disease. The condition is less often observed in people with shallow natal clefts.

Not a Congenital Condition

Pilonidal disease is not caused by an infected congenital cyst. The abscess cavity in pilonidal disease does not have an epithelial lining

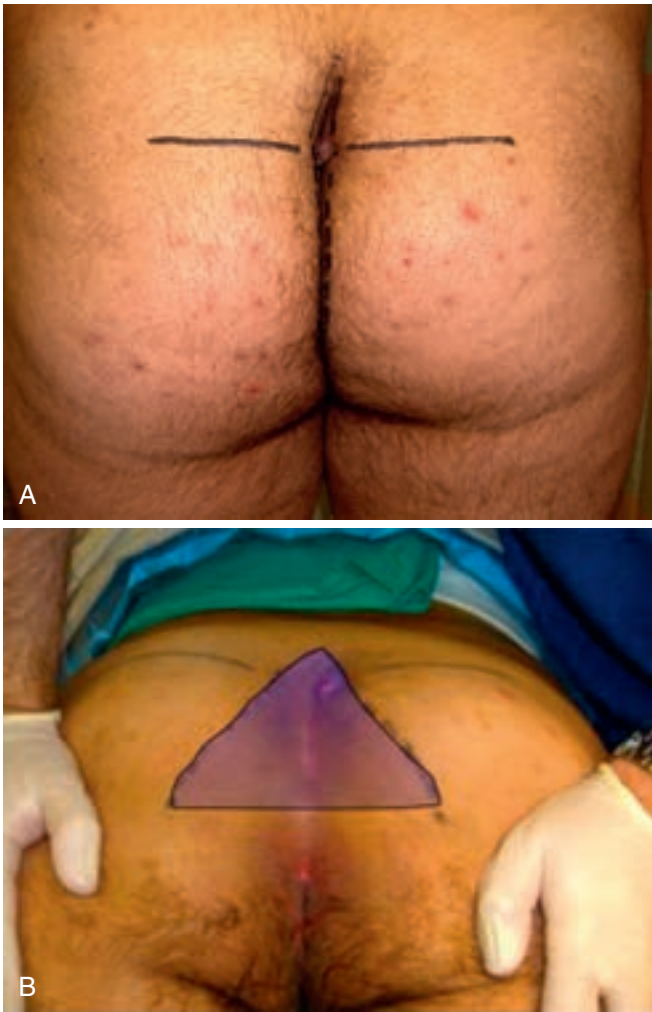


FIGURE 1 **A**, In a patient lying down, the edges of the buttock cheeks that touch when the person is standing are marked. The horizontal line is the contact point with the chair when the patient is seated. **B**, The buttock cheeks are spread to reveal the natal cleft, a 5- to 9-cm region bounded by the midsacrum and the perineum. The lateral borders are formed by the edges of the buttock cheeks that touch when the person is standing.

and is therefore not a cyst. Therefore, the term *pilonidal cyst* is a misnomer. The condition is simply a subcutaneous abscess filled with purulent material and debris, most often hair.

Implications of Anatomy on Surgical Approach

Failure to recognize that the depth of the cleft is the causative factor in this disease leads to misdirected surgical procedures. Wide excisions that attempt to remove a nonexistent cyst leave large midline wounds in persistently deep clefts that may not heal because of the anaerobic environment and repetitive shear forces (Figure 4). Such procedures often result in a larger wound that is even more difficult to treat than the original abscess. Even when such wounds heal, individuals remain at risk for recurrence of pilonidal abscess because the original cleft conditions remain hostile: the cleft remains deep.



FIGURE 2 Five midline dilated pits in pilonidal disease.



FIGURE 3 Chronic pilonidal sinus. Note four midline pits (the upper three contain protruding hairs) and left draining sinus tract cephalad to pits.

Making the Diagnosis

Pilonidal disease can exist for months or years before it causes symptoms. The disease may manifest as an acute painful abscess or as a chronic draining sinus. To make the diagnosis, the clinician must recognize the dilated pits in the midline of the natal cleft with or



FIGURE 4 Large unhealed wound 6 months after wide excision and attempted midline closure in a 19-year-old male.

without an associated secondary sinus. Shed hairs are often seen protruding from these midline pits. Patients may report trauma to the coccygeal area before the development of symptoms. Trauma can cause an abscess to become inflamed or otherwise bring the patient's attention to the area. Pilonidal abscesses are not thought to be the direct result of acute trauma.

A CHANGING PARADIGM

Despite the currently accepted notion that pilonidal disease is a condition that is acquired rather than congenital, many surgeons continue to perform wide excisions in the midline deep cleft in an attempt to remove the nonexistent congenital cyst. Surgical procedures for pilonidal disease will continue to be unsuccessful until surgeons realize that the depth of the natal cleft in affected individuals is the cause of the disease. Therefore, for procedures to be routinely effective, the natal cleft must be made shallower. Traditional operations for pilonidal disease typically involve the unnecessary extensive excision of tissue down to the sacrum. Wounds are then left open to heal by secondary intention in the midline or closed in the midline in a residual deep cleft. Most midline incisions in a deep anaerobic environment will open because of trapped dead space and the hostile conditions in the cleft. Marsupialized wounds may heal but do so over a long period of time, and daily packing may be required. Many individuals with open sacral wounds are unable to sit, which results in significant morbidity that interferes with work, attending classes, or group living in school dormitories. A surgeon should not undertake an operation for pilonidal disease unless she or he is confident that the outcome is highly likely to be better than living with the disease itself. Often, overly aggressive surgical procedures make this condition worse and result in a more complex pilonidal condition or one or more large unhealed wounds that are more challenging to correct than the original problem (see Figure 4).

The Difficult Environment of the Cleft

Wounds in deep natal clefts are very resistant to healing. The reasons for this are not fully understood. Contributing factors include anaerobic conditions, a location and anatomy that challenge good hygiene, shear forces from movement, and mechanical forces from the natural contour and gluteal muscle tension. Aggressive débridement, cauterization,

and dressing changes are rarely successful in healing chronic wounds in this region. Even negative-pressure wound therapy is typically unsuccessful. The best corrective therapy is asymmetric flap closure of these wounds that make the natal cleft shallow and leave operative incisions off the midline, where they are in the open air and can heal. Surgeons should be aware of the potential danger of creating midline wounds in the natal cleft, inasmuch as they often do not heal. Significant pilonidal disease or recurrent pilonidal disease necessitates a definitive surgical procedure to reduce the depth of the natal cleft to render it well aerated, dry, and shallow, so that hair and debris cannot be trapped.

DIAGNOSIS AND DIFFERENTIAL DIAGNOSIS

Recognition of midline pits with or without a chronic draining sinus clinches the diagnosis of pilonidal disease. On occasion, the sinus opening, if present, can be contained within the natal cleft, but typically it lies outside the boundaries of the natal cleft and above it on the right or left side. This location of the secondary opening probably results from the body's attempt to expel infection to the outside world (the "closed" nature of the cleft may be perceived as internal). With acute abscesses, edema can obscure the midline pits, and these pits may be visible only once the abscess has been adequately drained and the swelling subsides. If it is difficult to see the primary openings; placing upward traction on the natal cleft skin often reveals these pits because their deep apices are often tethered to the underlying abscess cavity.

Pilonidal disease must be distinguished from other processes such as perianal abscess, perianal fistula, hidradenitis suppurativa, or unusual skin infections. If the abscess extends down the natal cleft and approaches the anus, the condition can be difficult to differentiate from a perianal abscess. Draining openings in the lower part of the natal cleft without the dilated midline pits can be the result of a perianal fistula. Sometimes perianal fistulas do occur in individuals with quiescent pilonidal disease, in which case the focus of treatment should be on the symptomatic perianal fistula rather than the quiescent pilonidal disease. Pits off the midline sometimes indicate a different disease process such as hidradenitis suppurativa or unusual skin infections such as syphilis, tuberculosis, or actinomycosis.

Classification schemes exist for pilonidal disease, but they are not commonly referenced and are therefore not of significant clinical utility.

Imaging

Imaging is generally not required to evaluate or confirm the diagnosis of pilonidal disease. Only in rare circumstances during which chronically ill patients are suspected of harboring osteomyelitis of the sacrum should imaging such as magnetic resonance imaging (MRI) be employed. Findings on fistulograms and sinograms rarely change surgical therapy. In circumstances in which an anal fistula must be ruled out as a cause of a low-lying natal cleft pit, MRI or endoanal ultrasonography with hydrogen peroxide injected in the external opening of the suspected fistula may be helpful.

ACUTE PILONIDAL ABSCESS MANAGEMENT

Pilonidal disease may initially manifest as an acute abscess. The primary treatment of an acute pilonidal abscess is incision and drainage. Drainage should be performed 1 to 2 cm off the midline to avoid a large midline wound. A cruciate incision or an elliptical incision is

needed to provide adequate drainage and prevent early closure of the draining incision. In such difficult-to-reach areas, packing is not recommended or required. Such procedures are usually safely performed in an office setting with local anesthesia and very rarely require an operating room setting. Antibiotics are usually not needed unless there is significant cellulitis or the individual is immunosuppressed or diabetic.

The flora of such wounds is usually represented by skin organisms, anaerobes, or both. These wounds do not typically contain resistant staphylococci unless they are recurrent.

After drainage, patients are instructed to soak in a warm tub several times a day for several days and to keep the area clean. Showering is permitted. They are asked to return in 3 weeks, at which time the primary openings are often seen.

Individuals who develop an acute abscess only once or who develop infrequent abscesses that necessitate only minor office-based drainage procedures are typically not advised to undergo surgical intervention. Over time, however, such conditions may progress to a chronic abscess with multiple dilated pits and chronic induration in the cleft without a drainable abscess. Patients with recurrent acute abscesses, those with a chronic abscess, and those who have a preference for definitive therapy should be evaluated or referred for surgical intervention.

CHRONIC PILONIDAL SINUS

A pilonidal sinus may develop after several acute abscess flares, or it may be initial presentation of the disease. Affected individuals have multiple dilated midline pits (some of which may be epithelialized as a result of their chronicity) and a chronic draining sinus that typically opens to the cephalad right or left aspect of the natal cleft.

Of importance is that the draining sinus at the top of the natal cleft is a secondary opening and that surgical treatment directed solely at this opening will fail to cure the condition because the more anally located primary pits are the source of the disease. Some individuals can live with a chronic pilonidal sinus with minimal symptoms and never require surgical intervention. However, in many cases, these sinuses are accompanied by annoying drainage and chronic pain, and therefore many patients desire definitive surgical therapy.

NONSURGICAL APPROACHES

Patients who have no symptoms despite the appearance of their pilonidal condition and those with minimal symptoms can be managed by observation. The best conservative approach involves doing nothing. There is little evidence that local shaving or hair removal is effective at preventing recurrent disease once primary openings have appeared. Some surgeons have advocated injecting phenol into sinus tracts to destroy them. This is quite painful and often has to be performed while the patient is under regional or general anesthesia, with a several-day hospitalization for postoperative pain control. The rationale for this treatment is that phenol destroys tissue and causes scarring. Because the scar tracts remain in the deep natal cleft, these individuals remain at risk for developing recurrent pilonidal disease. Few data support use of phenol in pilonidal disease.

SURGICAL APPROACHES

Indications for surgical intervention include recurrent acute abscesses, symptomatic chronic pilonidal sinuses, and patients' preference. Because of the demanding educational and employment activities of young individuals affected by the disease, many opt for surgery to try to eliminate the uncertainty of recurrent disease.

For early disease with several upper natal cleft pits and a short draining sinus, conservative surgical intervention consists of unroofing or pit-picking techniques.

Unroofing

In unroofing, a fistula probe is delivered through the lowest pit and out through either the highest pit or sinus if it is present (Figure 5). Electrocautery is used to perform a minimal elliptical incision over the probe and unroof the skin, connecting the midline pits and the sinus. The underlying abscess cavity is curetted to remove debris. The edges of the wound are best marsupialized. Packing can be performed but is cumbersome unless the patient has daily assistance. For short tracts, some patients can undergo these procedures under local anesthesia in an office setting, but procedures involving longer tracts necessitate regional or general anesthesia in an operating room. Wide excisions are unnecessary because the abscess cavities are rarely complex unless prior surgical procedures have been performed in this region. Injecting methylene blue is unnecessary because granulation tissue enables easy identification of the tract. Complete healing may take 6 weeks, but patients are permitted to be active during the healing period. Occasional silver nitrate treatments in the physician's office are useful in preventing the development of exuberant granulation tissue. The overall success rate of this procedure is unknown.

Pit Picking

Minimal excision of midline pits with débridement of the abscess cavity, often through a lateral wound as described by Bascom and Bascom, is a potentially curative procedure for early disease (Figure 6). Patients with several midline pits and perhaps a minor short tract sinus are candidates for this procedure. This procedure, performed with the patient under local anesthesia in the physician's office, involves small elliptical incisions (with a No. 11 blade or a 2-mm



FIGURE 5 Probing the fistula tract: the first step before unroofing the pilonidal sinus.

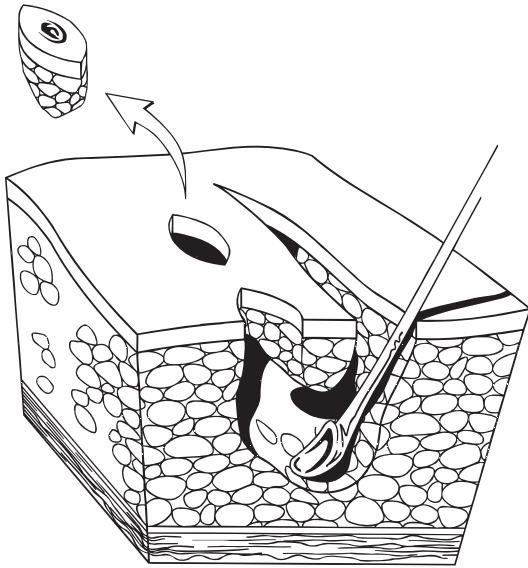


FIGURE 6 The incision is made lateral to the pilonidal sinus cavity, and the cavity is curetted. Pits are excised separately or en bloc. (Adapted from Nivatvongs S: *Pilonidal disease*. In Gordon P, Nivatvongs S, editors: *Principles and practice of surgery for the colon, rectum, and anus*, St. Louis, 1992, Quality Medical.)

punch biopsy blade) around the midline pits; these pits are closed with a fine monofilament suture. A lateral incision 1 to 2 cm off the midline enables access to the underlying abscess cavity. This abscess cavity is débrided with a curette and left open. Making the lateral wound elliptical enables adequate drainage and eliminates the need for packing. Patients return in 7 to 10 days for suture removal, and the wounds fully heal in approximately 2 weeks.

An alternative technique involves the use of trephines (small circular punch knives). In this technique, the midline pits are excised, as are their connections with the underlying abscess cavity, and the abscess cavity is débrided with the trephines. All wounds are left open.

The Goals of Surgery in Patients With Chronic Disease

The management of chronic pilonidal disease remains controversial. The first aim of surgery, however, is indisputably to eliminate the chronic infection and relieve pain and discharge in the least disfiguring manner possible with the shortest recovery possible. The second aim should be to decrease the possibility of future hair insertion into the vulnerable midline skin of the natal cleft by making it less deep. Unfortunately, many traditional surgical techniques have failed to adhere to these goals. Two commonly performed procedures are midline operations that involve a wide excision of the affected area in the natal cleft, often down to the sacrococcygeal fascia, with either a midline closure or marsupialization of the large resulting defect. Both these procedures introduce wounds in a persistently deep natal cleft. When wounds are closed in such environment, there is a high chance that the wound will open. Although open wounds may heal, they often do so at a high cost. Many of these wounds linger for months, necessitating daily meticulous care and packing. Data concerning the true recurrence rates after such procedures are limited. Evidence is increasingly in favor of a flap-based procedure with an off midline closure.

Asymmetric Flap Techniques

The Karydakis Flap

Dr. George Karydakis first developed the concept of eccentric excision for pilonidal disease and published his experience in 1973. In this technique, which is essentially an advancement flap procedure, an elliptical excision of skin encompasses the dilated midline pits and sinus tract and the underlying chronic subcutaneous abscess centered 2 cm off of the midline. After the excision, the skin and subcutaneous fat from the opposite side of the cleft is mobilized to produce a thick flap, which is advanced across the midline and sutured to the skin on the side of the excised tissue. The flap is further fixed to the underlying sacrococcygeal fascia. A Penrose or closed suction drain is placed at the upper end of the wound deep to the flap for several days to a week. This operation demonstrates some important concepts: wounds off the midline (where they are exposed to air) do heal, and shallower clefts help prevent recurrent disease because these clefts do not collect debris and do remain well aerated.

The results of a Karydakis flap operation are quite good, with a recurrence rate of only 1%, but complication rates are fairly high, at approximately 8% or 9%. Complications that occur include infections and fluid collections that necessitate drainage, but these rarely result in a failure of the operation. The operation, however, causes a significant degree of pain and can require a several-day hospitalization for pain control.

The Cleft Lift Procedure

The next evolution of the Karydakis operation, the cleft lift procedure, was originally developed by Dr. John Bascom. The goals of the cleft lift are to render the natal cleft shallow and to lateralize the incision. A cutaneous flap is both advanced and rotated across the midline of the natal cleft to make the cleft more shallow and therefore correct the anatomy that leads to recurrent pilonidal disease. In this procedure, the only tissue that is excised is an ellipse of skin rather than the skin, fat, and fascia of the Karydakis procedure. The abscess cavity wall is preserved and used in the closure to prevent dead space. Skin is necessarily removed so that the cleft has a smooth contour after the underlying tissue is brought together to eliminate the deep midline in the cleft. This operation is performed on an ambulatory basis and has become this author's preferred method of treating pilonidal disease that necessitates surgery.

The cleft lift operation requires meticulous planning and technique and is performed as follows. Preoperatively, the patient is asked to stand, and the line of skin contact of both buttocks is marked with an indelible marker. This defines the natal cleft lateral boundaries and serves as a guide for placing the wound so that it ends up in a well-aerated position. For orientation purposes, a second line perpendicular to the first is drawn where the patient's buttock cheek meets a chair in the seated position (see Figure 1, A).

General or regional anesthetic is used (a spinal anesthetic is preferred because patients can comfortably position themselves). Local anesthesia with sedation is not sufficient owing to the large size of the dissection. Patients are positioned prone (jackknifing is not necessary), and the buttocks are taped apart. The natal cleft, lower back, buttocks, and perianal tissues are shaven with clippers. The clinician must be careful not to injure fragile skin during this process because it can lead to wound complications. A field block with 0.5% bupivacaine with 1:200,000 epinephrine is administered.

An asymmetric ellipse of skin, which will eventually be excised, is marked on one side of the natal cleft, often the one that contains the sinus (Figure 7, A and B). The more scarred side is excised if the patient has undergone prior pilonidal surgery. The ellipse does not have to include the sinus, which will heal when the primary openings and underlying abscess have been removed. For a better cosmetic result, however, it is preferable to remove the sinus opening. The cephalad portion of the ellipse should be at least 2 cm above the top

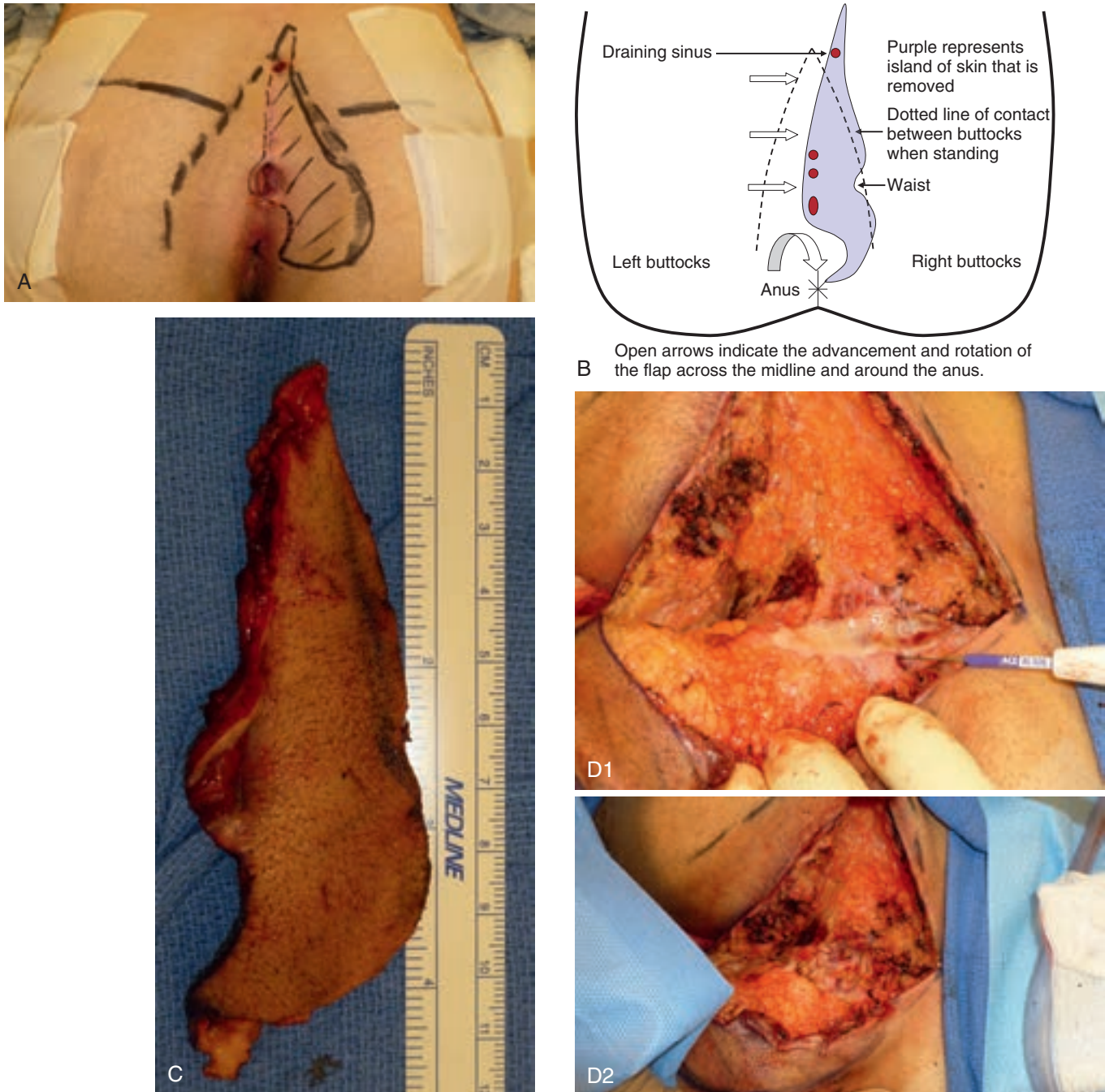


FIGURE 7 The cleft lift procedure. **A**, Operative planning photo showing markings of where buttocks meet (*dashed lines*), where the buttock meets the chair (*solid horizontal line*), and asymmetric ellipse of skin to be excised (*hatched area on right*). In this photograph, the right cephalad wound is the draining sinus, and the caudal wound is the large midline pilonidal opening. **B**, Operative planning diagram. **C**, Excised skin, including sinus opening at superior border and caudal wound in lower third (note that flap of skin shrinks in size after excision). **D**, Before and after cross-hatching: (1) intact fibrous abscess cavity wall, and (2) abscess wall after cross-hatching to disrupt fibrous fixation.

of the natal cleft to prevent the creation of a divot that can lead to recurrent disease. The anal aspect of the ellipse ends in a curve pointing toward the right or left posterolateral portion of the anus. It is important that the ellipse include all the primary midline openings. The lateral edge of the ellipse closely approximates the skin contact marking that was made preoperatively, but it comes in as a "waist" on a 45-degree angle to the lowest pit, inasmuch as this is the most challenging portion of the wound to close in a tension-free manner.

The medial line of the ellipse of skin to be removed is incised with electrocautery on the cutting mode or with a No. 15 blade. Cautery offers the advantage of being able to incise very precisely while remaining perpendicular to a contoured skin surface. It is very important that as much of the natal skin opposite from the excision is preserved for reconstructive purposes. The incision is made just to the opposite side of the dilated midline pits. The incision is carried around the lowest pit and ends in a comma-shaped or reverse

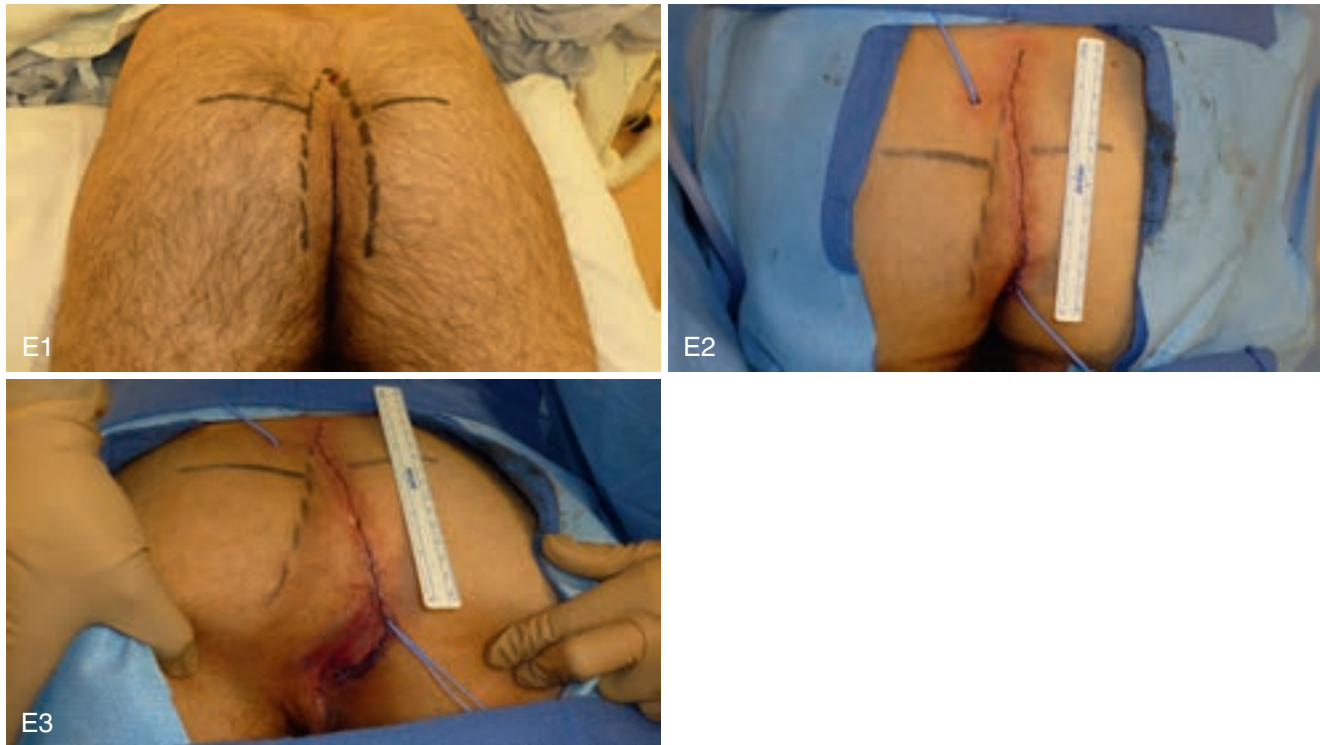


FIGURE 7, cont'd E, Comparison of the appearances of the natal cleft before and after surgery. (1) Preoperative deep and hirsute natal cleft; (2) immediate postoperative view of natal cleft that has been rendered significantly shallower with incision in open air, and (3) anus exposed to demonstrate lowest portion of incision.

comma-shaped curl pointing toward the corresponding posterolateral portion of the anus.

A skin flap is elevated off the opposite side of the natal cleft with electrocautery, extending out past the marked line of skin contact on that side. The flap is kept thin (3 to 5 mm in thickness, as in a mastectomy flap) at the cephalad aspect of the wound. The flap abruptly thickens toward the anal aspect. Dissection exposes the sacrococcygeal fascia overlying the coccyx. The anococcygeal ligament is exposed and divided to enable rotational mobility of the flap around the anus. This is the more challenging portion of the procedure (and an unfamiliar area for many surgeons), and care must be taken to avoid injuring the rectum, which lies immediately underneath the anococcygeal ligament. Once the flap is adequately mobilized, the ellipse of skin to be removed is elevated off that side of the natal cleft out to the lateral markings. This skin is dissected just beneath the dermis; all the underlying subcutaneous fat is preserved.

At this point, the tape is removed from the buttocks, and the coverage flap is draped across the midline while an assistant pushes the buttocks together and the lateral border of the ellipse of skin to be excised is marked again to ensure that the flap will adequately cover the resulting wound. The island of skin is then detached from its lateral attachment. The skin island typically measures 12 to 18 cm in length and 4 to 5 cm in width in the middle (depending on the body habitus of the patient and how close the lowest midline pit is to the anus; see Figure 7, C).

A large wound results from this excision. The abscess cavity and the long sinus tract can be seen (see Figure 7, D1). The abscess cavity and sinus tract are now unroofed and curetted free of debris. The abscess cavity wall is not removed, but occasionally the inner portion is excised if it contains a large amount of inspissated hair. Removal of the abscess cavity wall in its entirety would create dead space, in which infected fluid could accumulate and lead to an early recurrence of the abscess. The abscess cavity wall instead is cut into cubes of tissue left attached to the underlying tissue (see Figure 7, D2). This

is performed by making cross-hatch incisions to break up the scar to enable its rotational mobility during the next stage of the procedure. The wound is irrigated with antibiotic solution, and hemostasis is once again achieved with electrocautery.

The fibroadipose tissue of the buttock cheeks are next serially sewn together with numerous sutures of 2.0 absorbable monofilament suture as the assistant forcibly pushes the buttocks together. Numerous layers are required to take all tension off the flap. A passive drain (e.g., two Silastic vessel loops) is placed through a cruciate incision to the right upper aspect of the flap and is brought out through the wound itself at the inflection point where the wound dives down toward the anus (3 cm from the end of the anus). The superficial layers of the flap closure are created with 3.0 absorbable monofilament sutures, and the skin is closed with either interrupted or running 3.0 rapidly absorbing monofilament suture material (see Figure 7, A to C). Steri-Strips are applied to the wound, and the passive drain is tied to itself outside the patient to form a continuous loop. The incision often extends close to the anus to avoid a “dog ear” during the wound closure.

Patients are discharged the day of the procedure. They are instructed to have a caregiver roll gauze over the flap from the anal end to the upper margin to expel fluid from the upper drain hole three times a day. The drain is removed 9 days after the procedure, and patients are allowed to return to full activity at that time. The procedure does not cause significant pain because the flap is denervated during the procedure. Sensation is regained after a period of 6 to 9 weeks (see Figure 7, E).

Differences Between the Cleft Lift Procedure and Other Flap Procedures

The only tissue removed during the cleft lift procedure is skin. Hence, no dead space is created, and infected fluid does not have any place in which to accumulate. The procedure also seems to cause less pain

than other procedures in which thick tissue flaps are moved. Patients are administered broad-spectrum antibiotics for 2 weeks after the procedure because these wounds are all chronically infected, many grossly so at the time of surgery.

Complications include stitch abscesses and, very rarely, wound breakdown. Even in the rare event that a wound fully opens, complete healing usually occurs within a month with dressing changes because these wounds are lateralized and now well aerated. The result of the cleft lift procedure appears to be durable. Recurrence rates are similar to those of the Karydakis flap procedure, but there seems to be fewer major complications that necessitate intervention. Healing of the closed wound is usually rapid, and patients recover quickly, often participating in sports within 2 weeks of surgery (Figure 8, A to C).

The Limberg Flap

Another flap procedure that is more invasive but successfully employed for treating pilonidal disease is the rhomboid, or Limberg, flap. The asymmetric variation of this flap is preferred because it keeps the incision away from the midline. In this procedure, the abscessed area is excised down to the presacral fascia by means of a diamond-shaped incision. Next, a rhomboid flap is mobilized full thickness down to the gluteal fascia and rotated to cover the defect. This flap procedure is complex, somewhat morbid, and leaves a disfiguring scar. It is rarely needed.

SURGICAL PITFALLS

The surgeon must keep the following pitfalls in mind:

1. Be sure the diagnosis is pilonidal disease. Pilonidal disease is common and can coexist with other infections of the natal cleft. Make certain that the pilonidal disease is active when a treatment is undertaken, to ensure that the episodes of abscess are indeed caused by the pilonidal pits rather than a concurrent perianal abscess. Be certain that the draining sinus tract does not represent hydradenitis suppurativa. In pilonidal disease, there are often multiple primary pit openings in the natal cleft midline, but if a draining sinus exists, it is usually singular. In hydradenitis suppurativa affecting the natal cleft area, there are often multiple draining sinuses or abscesses that can occur on both sides of the cleft. Also, ensure that openings draining close to the anus do not represent secondary openings of an anal fistula. Often, these openings can be gently probed in the physician's office with a lacrimal probe to determine whether they track toward the anus or upward to the midline pits, which would confirm their cause. Imaging studies, such as MRI, are almost never required unless underlying osteomyelitis is suspected.
2. Do not miss the lowest pit. Patients must be examined carefully in the physician's office to determine where the lowest midline pit is so that surgery can be well planned. This exercise can be difficult, particularly in very hirsute patients or those suffering pain from a chronic infection. The surgeon must spread the patient's buttocks widely (usually with the aide of an assistant), have good lighting, and be prepared to clean the area of debris in order to have an adequate view. The same holds true in the operating room. Failure to incorporate the lowest pit in the skin excision specimen will surely lead to a recurrence.
3. Surgical procedures (including flaps or soft tissue rearrangements) aimed at excising or flattening the cephalad aspect of the cleft but fail to address the causative primary pits will lead to treatment failure. In circumstances in which a pit lies within 1 to 2 cm of the anal verge and a cleft lift procedure is being performed, the pit can be excised and closed with fine absorbable sutures. These closed excisions will heal when the wound

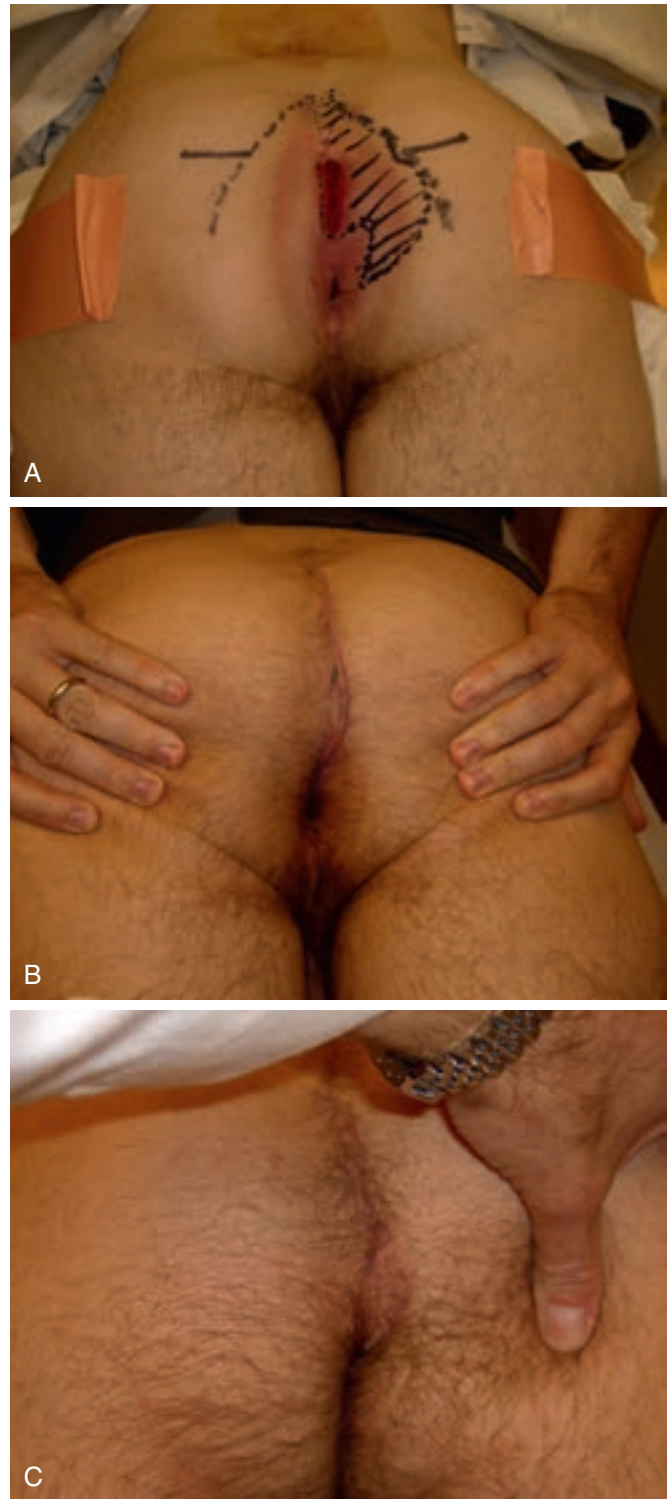


FIGURE 8 Before and after surgery. **A**, Before surgery: large pilonidal wound arising from confluent pits with preoperative planning markings. **B**, Seven weeks after surgery: postoperative shallowness of the natal cleft and near complete healing of wound. **C**, Four months after surgery: regrowth of hair, well-healed shallow natal cleft, and no recurrence of pilonidal disease.

has been rotated off the midline (around the anus) and detached from the sinus tract.

4. Failure to adequately rotate skin around the anus (often as a result of incomplete division of the anococcygeal ligament) during a flap procedure can result in a midline wound and lead to disease recurrence.
5. Avoid repeated wide excisions in the midline without rendering the cleft shallow.
6. Failure to excise an adequate length of skin during a flap procedure can lead to the creation of a midline divot in the residual cleft. Divots trap debris, and pits often develop in divots over time, leading to a recurrent pilonidal abscess. To avoid creating divots, the excision must start above the cephalad aspect of the natal cleft (generally 2 cm).

WHO SHOULD PERFORM SURGICAL PROCEDURES ON PILONIDAL DISEASE

Most general and colorectal surgeons have had little to no formal training in reconstructive flap procedures. Consequently, most are still performing outmoded procedures for pilonidal disease, including wide excisions with either midline closures or wide excisions with marsupialization. Earlier simple disease can be treated by any surgeon by unroofing of the sinus or by pit excision and lateral drainage.

If the disease recurs or if a patient has a complex primary pilonidal sinus, a flap procedure should be performed by an experienced surgeon. Unfortunately, few asymmetric flap procedures are currently being performed for more significant pilonidal disease. To offer patients optimal care for pilonidal disease, surgeons should feel comfortable in performing an asymmetric flap procedure. If a treating surgeon is not comfortable with one of these techniques, then the patient should be referred to a surgeon who is adept in performing flap procedures for complex pilonidal disease. Surgeons who do not perform surgery for pilonidal disease occasionally, have patient populations with high recurrence rates. Patients with advanced disease or recurrent disease from a failed procedure should be referred to a surgeon well versed in reconstructive flap procedures for this disease. There are many intricacies and tricks that can be learned only with experience. Furthermore, a surgeon performing a flap procedure should be very familiar with the cause and pathogenesis of pilonidal disease. Poorly performed flap procedures that leave a residual deep cleft or leave a low-lying pit are just as prone to failure as are misguided excisional procedures.

CANCER AND PILONIDAL DISEASE

Squamous cell carcinoma very rarely occurs in the setting of pilonidal disease. Those that arise are probably similar to scar carcinomas that result from chronic inflammation. The observation of a quickly

expanding ulcer with heaped up edges or a fungating mass should prompt a biopsy of the edge of the lesion. If a cancer diagnosis is confirmed, treatment typically involves a wide local excision down to and including the sacrococcygeal fascia. A large flap is usually required to close the defect. Adjuvant chemotherapy or radiation therapy should be guided by the pathologic features and the general recommendations for squamous cell carcinoma.

SUMMARY

Pilonidal disease is a conceptually simple and common disease that affects young adults. It is thought to be an acquired disease, and the theory of congenital origin has fallen out of favor. The causes of pilonidal disease are a deep natal cleft and repetitive mechanical motion that lead to the trapping of hair or debris under the skin surface to form an abscess. Afflicted individuals may present with an acute abscess necessitating drainage or with the more chronic phase of the disease, a pilonidal sinus. Simple surgical procedures such as pit excision with lateral drainage or unroofing are reasonable first procedures to be performed. Major excisions in the midline should be avoided because they often do not heal, which makes the condition worse and more difficult to treat. More contemporary flap procedures that render the natal cleft shallow with off-midline closure are best used to treat advanced disease and have low recurrence rates. The cleft lift procedure is very effective, can be performed in an outpatient setting, has low morbidity and low recurrence rates, and may be considered the preferred flap procedure in treating pilonidal disease.

SUGGESTED READINGS

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