

Pilonidal sinus: finding the right track for treatment

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ABSTRACT:

Pilonidal cyst is a troublesome condition affecting usually young people. It significantly influences quality of life and causes low self-esteem. Despite its known pathophysiology and numerous therapeutic methods available, pilonidal cysts still constitute a significant problem in general surgery. A large number of surgical techniques indicates the lack of a single method that ensures therapeutic success, and frequent complications cause both patient's dissatisfaction and frustration of the operator. In many cases, therapy is based on methods developed in a given healthcare center and their efficacy is usually not scientifically verified. Search for optimal strategy is also impeded by lack of an unambiguous clinical classification. In this article, we reviewed publications on various methods of managing pilonidal cyst, and we also presented surgical treatment used in our department. However, we did not manage to point out a surgical method with efficacy high enough to become standard treatment. It indicates the need for further search for new techniques that will give chances for successful treatment of pilonidal cyst.

KEYWORDS:

pilonidal cyst, polinidal sinus

INTRODUCTION

Pilonidal sinus is a chronic inflammatory process of the skin and subcutaneous tissue of the sacrococcygeal region. It presents clinically as a depression or one or multiple holes in the midline in the intergluteal cleft. In the course of the disease, the inflammation may exacerbate or even an abscess may form [1].

The first description of this disease was delivered by Mayo in 1833 [2]. In 1847, Anderson described management of an intergluteal infection in his article entitled '*Hairs removed from an ulcer*'. Since then, the lesion was referred to as pilonidal cyst, pilonidal sinus, pilonidal disease, pilonidal fistula, supracoccygeal cyst or supracoccygeal fistula [3].

Pilonidal cyst is a troublesome and embarrassing condition, significantly detrimental to quality of life of patients. Despite advances in surgery and many studies on various surgical and conservative treatment strategies, there is no clearly defined standard management scheme. No single method has been appointed that would allow for radical and certain cure while causing least discomfort to the patient at the same time.

In this article, we reviewed publications and analyzed various therapeutic methods of a pilonidal cyst, and we also presented the method used in our healthcare center.

EPIDEMIOLOGY

Pilonidal cyst is usually diagnosed in young males (4 times more often than in females), usually of Caucasian descent, less frequently African or Asian, most commonly after puberty (mostly in 2nd and 3rd decade of life). In females, the disease develops at a younger age, which is probably due to earlier beginning of puberty [4]. The following are considered risk factors of developing a pilonidal cyst:

- limited access of air to the intergluteal cleft
- presence of anaerobic bacteria in hair follicles
- production of a thick, keratin-rich and highly irritant substance by skin glands
- epidermal damage
- suction force in the intergluteal cleft during elevation of sacrum

- presence of hair, their thickness and structure
- dirt and excessive sweating
- overweight/obesity
- sedentary lifestyle
- deep intergluteal cleft
- positive family history for pilonidal cyst [5,6,7,8].

PATHOGENESIS

It was thought in the past that the pilonidal cyst – due to its location around the caudal end of the neural tube – is a congenital disease. However, this hypothesis has not been confirmed by pathology studies [9]. Another hypothesis assumes the disease to originate from numerous scent gland of the perianal region, which are not functional in humans but play sexual function in animals [10]. Those theories are contradicted by case reports of pilonidal cysts in other regions than intergluteal cleft, as well as cases in which the causative agent is a hair of another individual [11].

In 1992, Karydakos presented mechanism of developing pilonidal cyst, indicating three important factors: the hair, friction and skin susceptibility. It turned out that for development of pilonidal cyst, the following are important: hair structure and shape, number of ingrowing hair, deep and narrow intergluteal cleft resulting in great friction, skin structure and any changes to it. The most important part is penetration of hair to the subcutaneous tissue, which causes chronic inflammation. Subsequent hairs can penetrate into the sinus, resulting in chronic condition. Secondary openings indicate points at which hairs leave the subcutaneous tissue. In some cases, spontaneous healing is possible [12].

TREATMENT

Treatment of a pilonidal cyst is difficult due to low efficacy of therapeutic methods. Clinical assessment is necessary, and the choice of proper management depends on disease stage.

In the case of a shallow (depth less than 2cm) lesion with protruding hair, a trial of conservative treatment may be attempted. However, the patient should accept the risk of developing an abscess on every stage of treatment. Conservative treatment is only possible for non-infected pilonidal cysts. Every abscess requires surgical intervention. Conservative treatment includes:

- Thorough intergluteal hygiene
- Epilation (permanent removal of hairs, e.g. using a laser) [13]
- Ozone therapy [9].

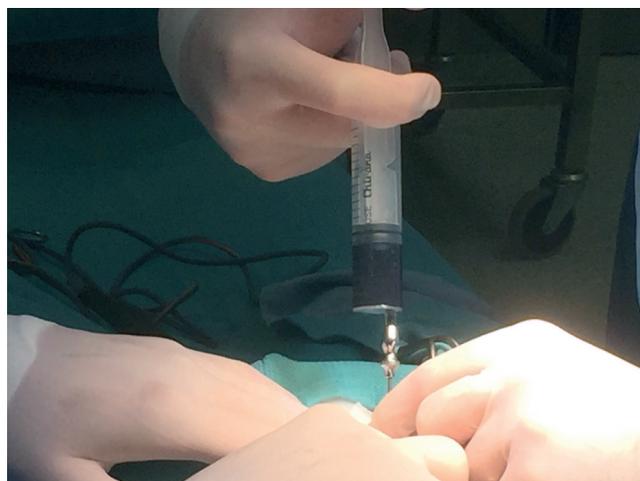


Fig. 1. Injection of methylene blue into the external opening.

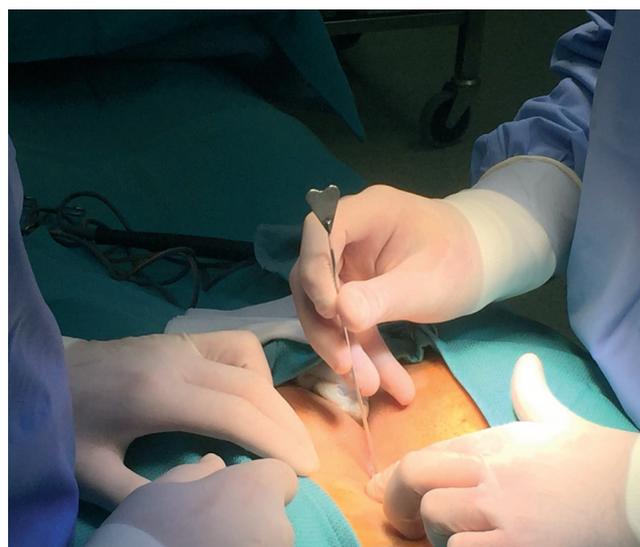


Fig. 2. Assessing course of the cyst using a probe.

Conservative methods used in the past, such as phenol injection, cryosurgery, thermal destruction, local radiation, are no longer recommended due to high rate of complications and patient's discomfort [9].

While applying conservative methods, it should be remembered to remove all hairs from the pilonidal sinus accessible through the skin opening [9].

One of conservative methods is application of fibrin glue for cyst closure. This method may only be used in patients with early lesions, with no history of abscesses, who have never underwent surgical treatment and have only one opening of the

pilonidal sinus. Prior to intervention, all hair should be thoroughly removed from the intergluteal cleft. The procedure is performed under local anesthesia and antibiotic prophylaxis, once the skin is decontaminated using an antiseptic. Hair and granulation tissue are removed from the cyst through the skin opening, the efficacy of treatment depending on precision. Then, the cyst is filled with fibrin glue and strongly pressed until the glue dries (ca. 2min). The procedure ends with application of pressure bandage, which is then removed after 24 hours. The efficacy of carefully performed procedure reaches even 90%. Correct qualification of patients is crucial, because only patients with uncomplicated early lesions can benefit from this method [14].

An interesting method is minimally invasive procedure proposed by Neol et al. During a scarless outpatient ablation of pilonidal cyst (SOAP), Farrell applicator is introduced to the cyst opening under local anesthesia, which is a device used in laryngology – a tip with a screw thread, onto which cotton is wound. The applicator should be screwed into the outer aperture of the cyst using little force (in order to minimize the risk of deepening the sinus), then the device should be removed from the wound without twisting. It allows to remove granulation tissue and hair residing inside the cyst. The channel is rinsed with 3% hydrogen peroxide solution, which allows to achieve hemostasis. The wound is left for granulation for 15 days – if it does not heal after that time, the procedure should be repeated. When the wound does not close after another 15 days, the patient is qualified for surgery. Authors of this method emphasized its simplicity, minimally-invasive character and possibility of radicalization in the case of failure [15]. In 1965, Lord and Millar published in the British Journal of Surgery a description of a similar therapeutic method using a fine nylon brush. However, data regarding efficacy of that method in long-term observation has never been published [16].

Another interesting non-invasive treatment method is Endoscopic Pilonidal Sinus Treatment (EPSiT). In this method, a fistuloscope is introduced to the pilonidal sinus opening under spinal anesthesia, and then hairs, necrotic and granulation tissues are removed under vision. During procedure, it is possible to use a wide range of endoscopic devices, and to use electric knife in order to obtain hemostasis and remove remaining granulation tissue. The procedure ends with widening of the external opening, which allows to achieve optimal wound drainage. The wound is left for granulation [17].

In the case of an early lesion with inflammation, conservative treatment with broad-spectrum antibiotics penetrating to skin (e.g. clindamycin) is sufficient [18].



Fig. 3. Resection with healthy tissue margin to fascia of sacrum.



Fig. 4. Specimen, fascia of sacrum seen in the wound bed.

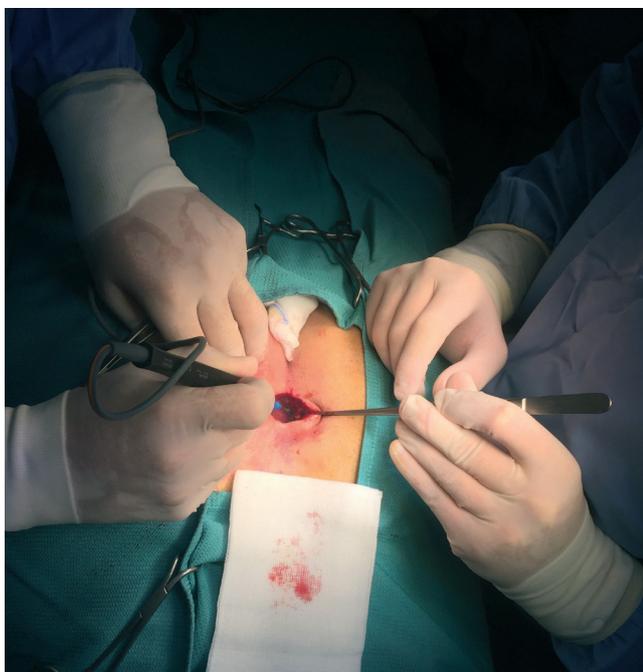


Fig. 5. Mobilization of wound edges.

It seems that in the case of uncomplicated pilonidal cysts, a trial of conservative or minimally invasive treatment should be attempted before the decision is made for a radical extensive surgery.

Abscess formation secondary to pilonidal cyst should always be treated surgically by incision, rinsing and drainage. In the case of extensive abscesses, a technique with additional lateral incision may be applied. In both cases, after the acute phase has resolved, radical treatment is necessary [4,18].

No uniform management scheme has yet been developed. Ideal surgical technique should:

- ensure cure with minimal risk or recurrence
- be simple
- not require long hospital stay
- bring minimal risk of complications
- allow quick return to normal daily activity [9].

A fundamental principle of surgical treatment is total resection of the lesion, including its lateral channels, up to fascia of sacrum. Application of dye to the external opening makes it easier to identify lateral channels of the cyst. The procedure can be performed under local anesthesia, however, because it is difficult to estimate the extent of resection prior to surgery, it is more comfortable for the patient and operator to use general anesthesia [4].

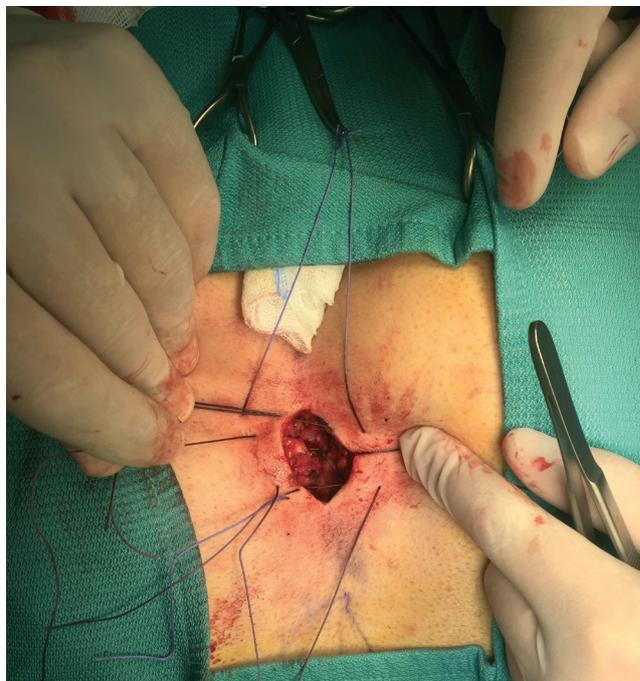


Fig. 6. Sutures through skin, subcutaneous tissue and fascia of sacrum in midline of the wound.

One of surgical methods is fusiform resection of pathological tissue up to sacral and gluteal fascia. The wound is left open for granulation. This method is usually successful, however, it requires a long-term therapeutic process with proper wound care. Negligence may result in serious complications. It is important to use antiseptics, remove hair from areas surrounding the wound, reduce excessive granulation tissue and eliminate epidermal bridges [10].

Another method of treatment is excision of pilonidal cyst with healthy tissue margin and primary wound closure. This method is less effective and only recommended for lesions with little inflammation, located superficially in the subcutaneous tissue. Incision can be done in the midline or asymmetrically. Strong shearing forces acting on sutures are a great problem. An important element of this method is non-bending of the wound in the intergluteal cleft, which protects from recurrence [10]. A method that constitutes a compromise between open and closed wound technique is excision with marsupialization, when wound edges are attached to the fascia of sacrum. It causes decrease in granulation surface and significant shallowing of intergluteal cleft [10].

Alternative methods with similar efficacy – although more difficult technically – involve: V-Y plasty, Z-plasty, plasty using Limberg flap, Karydakis plasty, Bascom II and others [10].

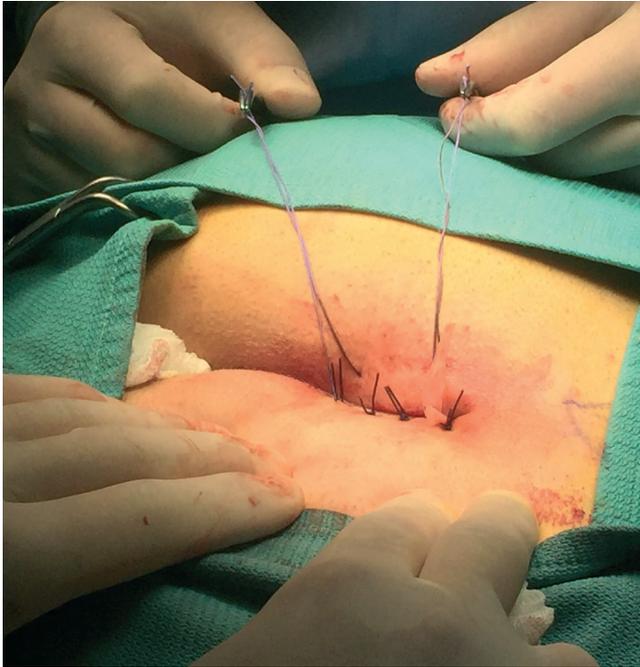


Fig. 7. Closed postoperative wound.

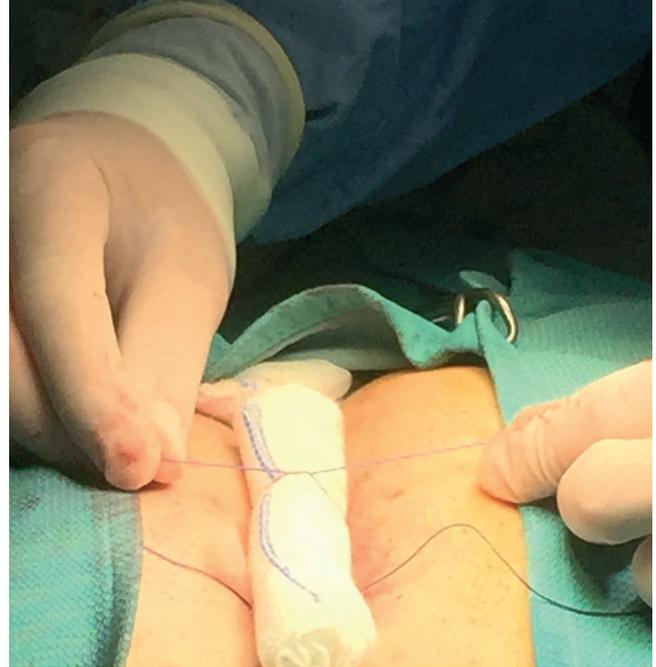


Fig. 8. Application of bandage.

The most commonly used method is simple excision of pilonidal cyst. Primary wound closure shortens healing time, however, it is associated with an increased complication rate, including infection and dehiscence, and recurrence of the disease as a result. Leaving the wound 'open' to heal requires longer convalescence time, but also with lower rate of recurrence [1,4,19].

Relocation of flaps should be reserved for patients with extensive chronic lesions. In the case of less extensive pilonidal cysts, deep incisions with mobilization of subcutaneous tissue allows for faster healing and is more acceptable by patients than flap surgery [20,21].

Due to a large number of surgical techniques, management should be based on randomized studies on large groups of patients. Enriquez-Navascues et al. conducted meta-analysis of 25 randomized studies on total of 2949 patients. Wound healing, recurrence and infection rates were analyzed with respect to surgical technique. The following were compared:

- wide incision with open wound
- limited excision with open wound (sinusectomy)
- incision of cyst (sinusotomy)
- classic midline and tension-free paramidline closure
- deepened excision with a flap
- open wound with primary closure [22]

In four studies, it has been confirmed that, although recurrence rate was similar for limited and radical methods, better results are achieved using limited treatment with open wound healing when other criteria (healing process, infections) are considered. In 10 studies, midline and paramidline primary wound closure were compared. Infection and dehiscence were more frequently observed in the case of midline closure. In 6 studies, Karydakis/Bascom and Limberg methods were compared. No differences were noted as for the assessed criteria. In one analyzed study, it has been shown that postoperative wound drainage leads to reduction of infectious complications, however, it does not influence long-term results [22].

Intuition suggests that primary wound closure should result in faster healing. However, it seems that patients with 'open' wound less often complain about pain and healing complications [22].

It seems that application of wide radical excision with primary midline wound closure should be limited in favor of less extensive procedures with 'open' wound or asymmetrical closure [22].

However, a limitation associated with meta-analyses should be borne in mind, namely the lack of opportunity for detailed comparison of surgical techniques and postoperative management, which can influence long-term results. It is also important to consider preoperative risk factors of complications

and preoperative classification of disease advancement, which were lacking in most studies.

In the study by Milone et al. on a group of 1006 patients, risk factors of postoperative complications were analyzed. It has been noted that associated diseases and distance between most lateral cyst opening and the midline are independent risk factors for postoperative complications. It has been confirmed that when that distance exceeds 2cm, the probability of complications and impaired healing reaches even 80%. The authors suggest that when any of those factors are present in a patient, incision in the midline should be abandoned in favor of another surgical access [23].

Describing surgical techniques, the use of methylene blue for visualization of pilonidal sinus channels is worth noting. In a prospective randomized study on 33 patients in Istanbul, it was confirmed that use of methylene blue may lower the efficacy of pilonidal cyst excision [24]. It should be remembered that injection of methylene blue in each opening does not guarantee that the dye reaches all recesses in subcutaneous tissue. Removing the cyst, attention should be drawn to radical resection of all regions where subcutaneous tissue appears to be inflamed, not only those dyed by methylene blue. Although the dye makes intraoperative navigation easier, all resected tissue should be closely investigated and the procedure should remain radical [24].

In our centre, we use methylene blue (Photo. 1) and examine cyst openings using a probe before a skin incision (Photo. 2) in order to determine initial extent of resection and wound shape. Prior to surgery, we spread the buttocks and fix them to the surgical table for best exposition of the operated site. We perform resection in the midline to the fascia of sacrum, removing all tissues dyed by methylene blue as well as those that look inflamed on macroscopic assessment (Photo. 3, 4). Next, we mobilize the subcutaneous tissue (Photo. 5). We perform the procedure using an electric knife, which allows to obtain optimal hemostasis. Then, a size #2 braided suture is applied through skin edges throughout the entire thickness of subcutaneous tissue and fascia of sacrum in the midline of the wound (Photo 6). Adhesive tape is removed in order to lower the tension in intergluteal cleft and we bind sutures to close the wound (Photo 7). Next, a monofilament sutures sized #2-0 are applied leaving spaces between them, so exudate can escape the wound. Usually, a drain is left in the wound. A bandage made of rolled gauze is applied to the wound, which is fastened using ends of the braided suture (Photo 8). The bandage and drain are removed on 1st or 2nd postoperative day. The patient is discharged home usually on 2nd postoperative day. Until fully healed, the patient comes to

hospital clinic for regular follow-up visits. During that time, we advise thorough hygiene of the operated region. In the case of developing fluid collections, we drain them by removing one skin suture. In the case of dehiscence at one end, we leave the wound for granulation. After the wound is fully healed, we advise the patient to visit beauty salon in order to remove hair from intergluteal cleft with laser.

In many case reports of pilonidal cysts, various surgical methods were implemented as well as different postoperative wound management, e.g. negative-pressure VAC therapy [25]. However, no management strategy has been defined that would provide low recurrence rate and high postoperative comfort.

Considering etiology and character of the disease, it is unlikely to expect that a clear management scheme for pilonidal cyst will ever be indicated. It seems reasonable to use a method that is mastered by a specific surgeon, acceptable for the patient, but also critically assessed by the operator himself. If it is noticeable that the given method brings large number of complications, recurrences or significantly lowers quality of life, we should not be afraid to use other methods of treatment of this troublesome condition.

CONCLUSIONS

The choice of optimal treatment for pilonidal cyst is very difficult. A large number of publications presenting various methods of treatment indicate the lack of a method characterized by high efficacy and low recurrence. It is worth noting that in many healthcare centers, management of pilonidal cyst is determined by a long-standing tradition. It results in application of methods with efficacy and influence on quality of life that have never been verified. It should be emphasized that formulation of management schemes is difficult due to lack of clear description and unambiguous qualification [classification – transl.]. In practice, it is difficult to choose between conservative and minimally invasive treatment when it is impossible to differentiate between early and chronic lesions. It is possible for patients to not experience any symptoms and visit surgical clinic once an abscess develops. Although the disease itself seems simple regarding its pathophysiology, its treatment can be hard. It can be troublesome for a surgeon, who observes a non-healing wound for a few weeks, or observes disease recurrence shortly after successful operation. Considering the fact that this condition is very uncomfortable for the patient, it is worth trying to search for better and less mutilating methods of pilonidal cyst treatment.

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