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Recurrent Pilonidal Sinus: Lay Open or Flap Closure, Does It Differ?

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Treatment options of pilonidal sinus, which has high recurrence rates, is still controversial. In this study, we aimed to analyze for possible factors affecting recurrence. Forty-one patients with recurrent pilonidal sinus were included in this study. Of them, 33 were male and 9 were female (mean age, 24.9 years; age range, 16–42). Factors (*i.e.*, risk factors) were detected in 32 patients. Excision–secondary healing and lay open was performed on 30 of the patients admitted with recurrence. Excision and flap closure was applied on 11 patients. Our recurrence rate was 9.7%. The recurrence rate of our study is compatible with the literature. Comparative studies are needed to determine the appropriate method to decrease recurrence rate.

Key words: Pilonidal sinus – Excision – Secondary healing – Flap closure – Lay open

Sacrococcygeal pilonidal sinus is a chronic disease that mostly affects young adults.[1] This pathology was first described in 1833, and its denomination arises from the Latin terms "pilus" and "nidus" meaning "a nest of hair." Its incidence varies from 10 to 26 per 100,000 population.[2,3] Pilonidal disease can be considered an acquired disease, even though the etiopathogeny is still not well defined. Some etiologic factors, such as hirsutism, deep natal cleft, obesity, local trauma, familial predisposition, smoking, and sedentary lifestyle have been suggested.[4,5]

Surgery is the main treatment, and up to 40% of patients develop recurrence. The management of patients with recurrent disease has led to the development of different surgical approaches. There is no agreement on any optimal surgical technique that would minimize the recurrence rate, and controversies are still common.[6,7] The surgical treatments of primary pilonidal sinus include a wide spectrum of techniques that vary from sinus excision with secondary healing of the surgical wound or marsupialization, to the use of flap reconstruction.[7] Primary closure is preferred in patients with pathology limited to the midline and

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Table 1 Patients' characteristics[a]

	Number of patients (%)[a]
Familial history (+)	29 (71)
Familial history (−)	12 (29)
Disease-related factor (+)	32 (78)
Disease-related factor (−)	9 (22)
Previous operation(s)	
Excision + primary closure	35 (85.4)
Excision + secondary healing	5 (12.2)
Excision + flap reconstruction	1 (2.4)

[a]n = 41.

for whom residual defect after excision is narrow: Karydakis or Bascom procedure can be used. When the residual defect is anticipated to be wide, excision with secondary healing of the wound or flap reconstructions are preferred.[3] The management of the patient with recurrent disease may require a more complex surgical approach as the excision may be wider or the initial surgery may have led to the loss of the intergluteal tissue.[8,9]

Patients and Methods

From our hospital database, 370 patients operated on between May 2008 and February 2012 were analyzed retrospectively. Forty-one of 370 patients with recurrent pilonidal disease were included in the study. Thirty-five of these patients had a history of previous operations elsewhere. The demographic information analyzed included patient age, sex, familial history of the disease, operation performed for the recurrent disease, and duration of follow-up. The patients selected for the study were contacted by telephone and then called back for clinical evaluation. Patients were asked about pilonidal sinus–related factors including postoperative wound care, duration between operation and recurrence, number of previous operations, type of previous operations, and operation type performed for the last episode of the disease. All the operations were performed in the same center, by 2 experienced surgeons.

Surgery

All patients were operated on under spinal anesthesia, in prone position. The visibility of the intergluteal area was maintained by lateral traction from the lateral margin of the gluteus, using adhesive tape. Sinuses with extensive or branching tracts, with lateral extension from the natal cleft were managed with rhomboid excision and Limberg flap reconstruction. Karydakis flap reconstruction or Z-plasty were the procedures of choice for sinuses with a tract longer than 4 cm but disease limited to midline. Patients with a tract limited to the natal cleft or not longer than 4 cm underwent local excision with the wound left to the secondary healing and lay open. The secondary healing and lay-open groups were discharged on the same day of surgery.

Results

From the 41 selected patients, 33 (80%) were male, and 9 (20%) were female. The average age was 24.6 years (interval between 16 and 42 years old). Twenty-nine (71%) patients had a familial history of pilonidal disease. In 32 patients, etiology-related risk factors (hirsute body habitus, deep natal cleft, obesity, local trauma, familial history, sedentary lifestyle, smoking) were present. According to the type of operation performed before the patient's admission to our clinic, excision and closure of the wound was performed on 35 of 41 (85%) patients, excision and secondary healing of the wound on 5 (12%), and excision with Limberg flap on 1 patient (2%) (Table 1). Seven (17%) patients had previously been operated on several times before being admitted to our institution. Among the 41 selected patients, 10 (25%) had no recovery from the last preceding operation, while a disease-free period of time before recurrence was reported in 30 (75%) patients (with an average follow-up time of 23.7 months). We proceeded with sinus excision with secondary wound healing and lay open in 30 patients, and sinus excision with flap reconstruction in 11 (8 modified Limberg flap, 2 Karydakis, 1 Z-plasty). The average follow-up time was 23.2 months (interval, 6–53 months). During this period of time, 4 (9.7%) patients developed recurrence. Characteristics of these patients are summarized in Table 2.

Discussion

Although pilonidal sinus cannot be considered a debilitating disease, patients are confronted with discomfort and low quality of life owing to complications such as abscess formation or sinus-related drainage or pain.[10,11] The recurrence is most often due to the omission of any tract during the initial operation, infection of the wound, or abscess

Table 2 Characteristics of patients with recurrence

Patient No.	Procedure[a]	Age (y)	Sex	Family history	Etiology-related risk factors	Duration time	Present operation	Recurrence (%)[b]
1	Excision + flap reconstruction	32	M	+	+ (smoking)	17 mo	Limberg flap	1 (9%)
2	Excision-secondary healing	20	F	+	+ (obesity)	19 mo	Lay open	3 (10%)
3	and lay open	33	M	+	−	20 mo	Lay open	
4		31	M	−	+ (smoking)	36 mo	Excision-secondary healing	

[a]Of 41 patients, 11 (27%) had excision + flap reconstruction and 30 (73%) had excision-secondary healing and lay open.

formation, that may lead to formation of a new sinus tract inside the cicatrizing wound. Accumulation of dead tissue or debris in the intergluteal cleft, sweating, friction, or poor hygiene are predisposing factors for recurrence.[12] In addition, placing the suture line on the midline with considerable tension on the line and failure to lessen the depth of the natal cleft are also important contributors for recurrence. Last, poor wound care with lack of depilation around the wound also contributes to recurrent disease for patients with lay open.[13]

A variety of surgical techniques have been described in the literature for treatment of the primary pilonidal sinus. The treatment methods can basically be divided into 2 groups, including open and close methods: in the open method, the residual cavity is left open after sinus excision. Lay open is one of the open methods that has also been described and consists of opening the skin covering the sinus and curettage of the residual cavity. This provides a narrower cavity and minimizes tissue loss.[14] Close methods consist of closure of the wound after sinus excision. In this group, the surgical techniques differ according to the type of the wound closure. The cavity can be managed by a midline closure, an off-midline closure, or a flap reconstruction. Phenol treatment for pilonidal sinus is a preferable conservative method which is used instead of surgery according to some authors because of its excellent cosmetic results. Girgin *et al* reported 42 patients who had undergone crystallized phenol and laser depilation prior to it. According to the authors, a combination of crystallized phenol treatment and laser depilation is a minimally invasive method with perfect cosmetic results and low recurrence rates.[15] Each of these techniques has been used in the treatment of the primary pilonidal disease. But in the management of the recurrence, flap reconstruction or secondary wound-healing techniques after sinus excision is preferred.[16]

The open surgical technique is simple to perform. Its recurrence rate is low, but it requires a longer time for wound healing and postoperative wound care. Daily painful wound care and the slow process of secondary healing are the main disadvantages of open techniques; namely, lay open. Marsupialization, however, by shallowing the cavity after lay-open technique, helps to hasten the healing process.[17,18] In a randomized study, Gençosmanoğlu and Inceoglu[14] compared the marsupialization technique with the primary closure technique in 142 selected patients. Patients in the marsupialization group had a lower recurrence rate (1.4%) and lower average time of return to work (3 days). Kepenekci *et al*[19] performed unroofing and curettage (lay open) technique for 297 patients, 25 with recurrent disease; they describe the procedure as a successful, easy-to-apply, and cost-effective technique. According to the authors, the technique could be applied in the setting of chronic disease, abscess formation, and recurrent disease with low recurrence rates (2.7%, 0%, 0%, respectively). Even with these successful results, the median wound healing takes 5.4 weeks.[19]

Lee *et al*[20] recommended primary closure be used in the treatment of the primary disease, but that recurrences should be treated by flap reconstruction. Lieto *et al*[16] used sinus excision with flap reconstruction technique in a study on 55 patients with recurrent disease, and only one patient (1.8%) developed recurrence. This patient was then successfully treated with the open technique. Better cosmetic results were reported in patients with the primary or secondary disease treated by rhomboid excision with Limberg–Dufourmental flap reconstruction. Authors report that obesity is an important predisposing factor of recurrence. One crucial point stressed for preventing postoperative recurrence is flattening of the natal cleft and moving the suture line laterally from the midline. Setting out from this idea, Karydakis and Bascom techniques were developed.[21,22] Majeski *et al*,[23] treated 127 patients with Bascom technique and reported recurrent disease in 3 patients at 1-year follow-up or sooner. Furthermore, they treated those 3 patients

again with Bascom technique successfully and had an excellent cure rate with sutures away from midline. Using the same principle, modified Limberg flapping enables tension-free closure, leaving the inferior edge of the incision lateral to the midline. In the prospective study of Mahdy *et al*, excision and flap reconstruction and excision and primary-closure techniques were compared. According to the authors, flap reconstruction was found superior to the primary closure by means of patient comfort and wound healing. Among the flapping techniques, Limberg flapping was found to produce the best results.[13] Onder *et al*[24] used the Limberg flap and primary-closure method in 144 patients in their prospective study. Postoperative complication rates were higher in the flap-closure group than in the primary-closure method, but recurrence rates were lower. In this present study, sinus excision with flap reconstruction was performed in 11 patients, while the open technique after excision was performed in 30 patients. The recurrence rate for flap reconstruction was 9% (1 patient) and 10% (3 patients) for the open technique. Personal hygiene, periodic epilation, and daily wound care are the keystones for preventing recurrence especially for the patients in the secondary healing group. Thus, proper patient education both in the preoperative and immediate postoperative period is crucial. Close follow-up of the wound is advised and should be carried out in the same center to facilitate wound evaluation and, ultimately, lower the recurrence rates.

Some etiologic factors, such as hirsute body habitus, obesity, local trauma, familial predisposition, smoking, and sedentary lifestyle, have been suggested as predisposing in the development of the primary disease.[4,24] Predisposing factors are of great importance in the formation of pilonidal sinus disease, which is known to be an acquired disease. These factors also play an important role for recurrent disease. Deep natal cleft, sweating, presence of free hair, and poor hygiene, with the help of the vacuum created by the hip movements, contribute to the formation of new hair cores in the scar tissue. As a result, these predisposing factors should be avoided as much as possible after the initial operation. Akıncı *et al*[25] have measured the depth of the natal clefts of the healthy volunteers and patients with pilonidal disease. The natal cleft of the patients with pilonidal disease was found to be significantly deeper than in the healthy volunteers. Awad *et al*[26] recommend that the patient's hair structure, weight, the sinus tracts extension or disposition to the natal cleft, and the duration of the symptomatology should be considered in the choice of surgical technique. Doll *et al*[16] have evaluated the long-term recurrence rates of 578 patients who were operated on for primary pilonidal disease. They have shown that, after a 25-year follow-up time, patients with a history of pilonidal disease in first-degree relatives have significantly higher recurrence rates than the sporadic cases (52% and 28%, respectively). The authors argue that a high body mass index at the time of admission—interestingly, contrary to other studies—is not correlated with high recurrence rates.[5]

Etiology-related risk factors (hirsute body habitus, obesity, local trauma, familial history, sedentary lifestyle, and smoking) were found in 32 patients for this present study. According to our study, with a limited number of patients, we are of the opinion that

1. the approach to the recurrent sinus disease does not differ widely from the treatment of primary disease;
2. risk factors for recurrence are similar for primary and recurrent disease;
3. the primary goal should be the elimination of the risk factors for recurrence regardless of the surgical approach;
4. flap reconstruction methods for the treatment of recurrent and large sinuses with lateral extensions and lay open with secondary healing for small sinuses without any lateral extensions are appropriate and efficient techniques; and
5. personal hygiene, periodical epilation, and daily wound care are the keystones for preventing recurrence especially for patients treated with open techniques, and proper patient education and cooperation are crucial.

Further comparative studies are needed with larger series of patients.

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