



Recurrent pilonidal disease surgery: Is it second primary or reoperative surgery?

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ABSTRACT

Objective: Pilonidal sinus disease (PSD) affects mainly young men's social and work life with frequent recurrence rate. Reoperation for unimproved or recurrent disease is somehow troublesome. Surgeons may think that changing treatment strategy after recurrence may prevent further relapses of PSD. We analyzed patients with recurrent pilonidal sinus to determine their predisposing features for recurrence and the outcomes of the preferred surgical methods.

Material and Methods: From 2007 to 2012, out of 95 recurrent pilonidal sinus disease (rPSD) patients, 62 operated cases were included and examined retrospectively. Their retrospective data were examined for demographics, 1st and 2nd operation types, patient satisfaction and pain scores. For cases with insufficient preoperative or postoperative data, phone call and interviews were done to obtain data. Some were kindly invited to the outpatient examination. Student's t test, Mann-Whitney U test, and Kaplan Meier test for disease free survival time were used where appropriate. P values less than 0.05 were accepted to be statistically significant.

Results: Total of 62 rPSD patients were examined. Male:female ratio was 2.9:1. The mean age after 1st and 2nd operations were 24.7 and 28.1 years, respectively. One and five-year recurrence rates were 33.9% and 66.1%, respectively. The mean interval between the 1st and 2nd operations was 45.6 months. Excision and midline closure was the most frequent type of operation followed by flap reconstructions and excision-lay open procedures. The 1st operation types of rPSD cases were different from that of 2nd operations. Pain perception and satisfaction scores were better in flap reconstruction groups.

Conclusion: Reoperative surgery of rPSD is satisfactory with certain precautions. Relapses after flap reconstruction procedures with a well-being period should be referred as second primary disease. Changing surgical strategy is not always indicated as some patients with recurrence have relapsing or second primary disease that have distinct clinical course. Re-flap surgery after any kind of relapse is well appreciated.

Keywords: Recurrent, pilonidal, surgery, reoperation

INTRODUCTION

Pilonidal sinus disease (PSD) leads to serious social, economic and health care problems. Its prevalence is 1-4 per 25000 population, with a 40% five-year recurrence rate (1-3). Approximately 70% of PSD patients are between 20-30 years of age (4). Risk factors include obesity, smoking, poor hygiene, sedentary life style, African race, family history, and high amount of hair on the body. The recurrence rates for PSD after lay open and primary closure techniques are 17% and 30%, respectively (1). Primary closure techniques are divided into two main categories. The first category deploys the suture line lateral to the natal cleft while flattening it (such as Karydakis, Bascom, Rhomboid excision and Limberg flap reconstruction) whereas the second category leaves the suture line in the midline within the natal cleft. The latter technique results in significantly higher recurrence rates as compared to the former (7-40% and 0-3%, respectively) (5-7). Limberg technique seems to have the lowest wound related complication and recurrence rate (8-11). However, excision and primary midline suturing has been the most frequently used method with the highest postoperative complication and recurrence rates (12).

Since the longest time interval for recurrence has been reported as 22 years in the literature, five year follow up is recommended for determination of the true recurrence rate (2). Recurrence after one and five years are reported as 12-15% and 60-80%, respectively (1, 2).

Recurrent PSD (rPSD) is somehow more annoying than primary disease both for the patient and the surgeon. Surgeons have less willingness to deal with rPSD in contrast to primary disease. This may influence the surgical approach to the rPSD in practice. The idea of changing the type of surgery applied at the first intervention comes in mind for recurrent cases in order to avoid tertiary or further recurrences since the procedure chosen for the first operation is deemed as ineffective.

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MATERIAL AND METHODS

Patients admitted to surgery for rPSD between 2007 and 2012 were recruited to this retrospective study. A total of 95 rPSD cases were extracted from the registry. Fifteen patients could not be reached and five patients refused to participate. Sufficient data could be obtained in 75 cases. Age, sex, occupation, body mass index (BMI), operation satisfaction, smoking status, comorbidity, preoperative and postoperative status, type of operation for primary and secondary interventions and demographic data were recorded. If the data in patient files or computer based charts were not enough, patients were contacted by phone for a brief interview. Estimated intraoperative lesion dimension, early and late postoperative complications were extracted from operative notes and patient observation notes. We excluded three patients with three or more operations. Moreover, 10 patients who had been operated in different hospitals were excluded. Finally, the study group consisted of 62 rPSD cases with sufficient data.

Duration of symptoms before the operation (months), time to return to work (days), and the highest pain perception independent of the postoperative period were recorded. We developed a questionnaire to understand the overall satisfaction level of the patient in terms of social life and physiological status. Patients were asked to choose the best item that reflected their status after the 1st and 2nd operations, the answers are listed in Table 1.

Statistical Analysis

All statistical analysis was performed using Statistical Package for the Social Sciences software version 22 (SPSS Inc.; Chicago, IL, USA). For group comparisons, Student's *t* test was used for parametric data, while Mann-Whitney U test was used for nonparametric data. Chi-square test was used for comparing two categorical variables. Risk factors for complications and recurrence were evaluated by multivariate logistic regression analysis. Disease free survival time was estimated by using Kaplan-Meier method. P values less than 0.05 were considered to indicate statistical significance.

This study was carried on with respect to the principles of World Medical Association Declaration of Helsinki.

RESULTS

A total of 62 rPSD cases were evaluated via the hospital registry system. We realized that some crucial data such as BMI, occupation, smoking status, and lifestyle were not listed. We made phone calls to all cases to fill up the desired parameters for this study.

The mean age at the time of first and second operations were 24.7 (14-34) and 28.1 (19-39) years, respectively. Female/male ratio was 1:2.9 with 46 (74%) male and 16 (26%) female patients. Smoking prevalence was 39 (85%) in male and 7 (44%) in females. The status of the PSD lesion before the 1st operation was asked. If the relapses were clustered into years after the first operation; 21 (33.9%) recurred within the first year, 14 (22.6%) in the second year, 15 (24.2%) in the third year, 5 (8%) in the fourth year, and 7 (11.3%) in the fifth year. The interval

between the onset of complaints and surgery before the 1st and 2nd operations were 4 (2-14) months and 8 (4-18) months, respectively. Mean interval between the operations was 26.5 (4-66) months. Data are listed in Table 2. There was a statistically significant difference between the intervals among the onset of symptoms and surgery before the 1st and 2nd operations ($p=0.007$). Mean hospitalization time was 3 (1-9) and 4 (1-9) days, respectively. Type of surgeries selected and mean pain scores are listed in Figure 1. The mean pain scores after the 1st and 2nd operations were not different but the mean pain scores for flap reconstruction surgeries after 1st or 2nd interventions were found to be lower in comparison to other types of surgeries ($p=0.004$). Operation dependent recurrence rate after the 1st intervention was significantly high for excision and primary midline closure surgery, followed by flap reconstructions and excision-lay open procedures. The mean volume of the excised lesions at the first and second operations were 24 (12-108) cm³ and 30 (18-144) cm³, respectively. Unfortunately, pathologic examination reports of the specimens did not include surgical margin status, i.e. whether the sinus tract(s) were in continuation at the edges of the specimen or not.

Summary of the answers to the questionnaire is listed in Figure 1. If the increased frequency of first and second item answers are accepted as increased satisfaction, there is a statistically significant difference between the group of patients choosing first and second item answers in comparison to the

Table 1. Pain perception questionnaire

1. I was cured completely after the operation.
2. I still feel some problems at the disease site but I am better than the condition before the operation. I can continue my social life and work without limitations.
3. The operation was futile. Nothing has changed. I am the same as what I have been before the operation.
4. I am worse as compared to the time before the operation. My social and work life got worse. I am doubtful for one more operation.
5. I am in big trouble now. I wish I had refused the operation. My social and work life have strong limitations now.

Table 2. Patient characteristics

	After 1 st operation	After 2 nd operation
Age	24.7 (14-34)	28.1 (19-39)
Sex (Male:female)	46:16	
Smokers (Male:female)	39:7	
Body mass index	29.1 (22-34)	31.1 (24-38)
Duration of symptoms before the operation (months)	4 (2-12)	8 (4-18)
Excised lesion diameter (cm ³)	24 (12-108)	30 (18-144)
Length of hospital stay (days)	3 (1-9)	4 (1-9)
Time to return to work (days)	28 (14-35)	31 (13-44)

group choosing third, fourth, fifth item answers after the 1st and 2nd operations ($p=0.024$). This indicates that the surgeon can expect satisfactory results after the 2nd operation. For the same two groups described above, there was a statistically significant difference between the patients who underwent the same operation, regardless of the type of surgery, as 1st and 2nd time interventions and the patients who underwent different types of operations as 1st and 2nd line interventions ($p=0.011$).

Postoperative pain perception was asked to compare pain scores between 1st and 2nd operations by using the numeric pain scale from zero to 10, where zero refers to the weakest pain the patient ever felt lifelong or no pain at all while a score of 10 refers to the strongest pain he or she felt throughout their lives. Answers are listed in Table 3. The change of perceived pain between two operations were noted for each patient and for each kind of operation. Excision plus primary midline suturing and excision plus flap reconstruction were the most abundant types as 1st and 2nd operations, respectively. Even the distribution of the type of the operations differs significantly, average difference between the pain scores for each kind of operation types were statistically insignificant (Table 4). BMI at the first and second operations were 29.1 kg/cm² (22-34) and 31.1 kg/cm² (24-38), respectively. Comparison of the different types of operation at the 1st intervention revealed that patients who had undergone flap reconstruction at the 1st surgery would not undergo flap reconstruction surgery again as a 2nd intervention. This means that surgeons in our clinic hesitate to perform flap reconstruction again for a second time. On the other hand, patients who had undergone surgery by not using a flap at the 1st time, underwent this type of operations as a 2nd intervention ($p=0.047$, $p=0.027$ respectively) (Table 5). The interval between the 1st and 2nd operations and return to work were 28 (14-35) and 31 (13-44) days, respectively. There was no statistically significant difference in returning to work after 1st and 2nd operation.

DISCUSSION

Primary or rPSD mainly affect the young adult population. There is no consensus on the true incidence of the disease. Reported incidence rates are reported as 1/1000, 10-26/100 000 and 26-700/100 000 population in the literature (2, 3, 9, 13). The disease is more frequent in the male population with a male: female ratio of 4.1 to 8.1 (13). Based on these rates, it is estimated that countries in which working life is mainly supported by young males suffer more from PSD. Interestingly all the patients who denied participating in the study were females. This was somehow explained by Onder et al. (13), like any other anorectal disease, females refrain from getting help until the disease is unbearable or it results in marked limitation. This is somehow true for the male population as well. Patients with PSD have less willingness to apply to a surgeon for cure. This may be due to the location of the lesion which makes patients shy or unaware of their illness at the early stages of the disease. This leads to presentation of patients with PSD to the surgeon at an advanced state with problematic abscess, cellulitis, numerous draining sinuses etc. During the

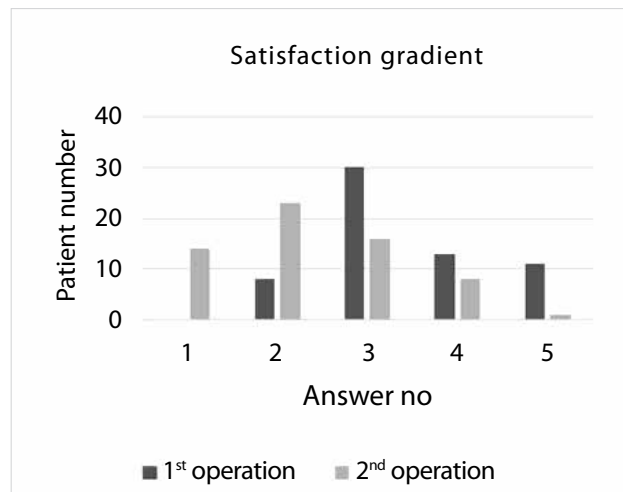


Figure 1. Satisfaction components

Table 3. Number of operations at 1st and 2nd intervention and mean pain scores

Type of operation	Number of the operation and the mean pain score after 1 st operation		Number of the operation and the mean pain score after 2 nd operation		Net difference (%)
	n	PS	n	PS	
Simple excision and lay open	0	0	3	6.1	NA
Excision and marsupialization	1	6.7	7	6.5	1.52% ↓
Excision and primary midline closure	43	7.3	14	7.9	3.94% ↑
Excision and flap reconstruction	18	4.5	38	5.1	6.25% ↑

n: Number; PS: Pain score; NA: not applicable

Table 4. The mean pain scores after 1st and 2nd operations

Pain score	After 1 st operation		After 2 nd operation	
	n	%	n	%
0	0	0	0	0
1	2	3.2	3	4.8
2	1	1.6	1	1.6
3	4	6.4	3	4.8
4	12	19.5	10	16.1
5	13	20.9	17	27.4
6	0	0	5	8
7	18	29	8	14
8	8	12.9	14	22.5
9	4	6.4	2	3.2
10	0	0	0	0
Mean	5.74		5.72	

Table 5. Swap numbers and operation change characteristics from 1st interventions to 2nd interventions

Type of the operation at 1 st intervention	Type of the operation at 2 nd intervention			
	Simple excision and lay open (n=3)	Excision and marsupialization (n=7)	Excision and primary midline closure (n=14)	Excision and flap reconstruction (n=38)
Simple excision and lay open (n=0)	0	0	0	0
Excision and marsupialization (n=1)	0	0	0	1
Excision and primary midline closure (n=43)	0	1	5	37
Excision and flap reconstruction (n=18)	3	6	9	0

n: Number

postoperative period, expecting the patient to clean the diseased site and to shave is somehow not proper since shaving the intergluteal region is difficult, and since patient relatives or friends may hesitate to help. This stands correct for the entire postoperative period. The surgeon should help the patient for shaving the diseased site since hairlessness and cleanness of the diseased site is always recommended postoperatively. Preventing hair growth by cosmetic materials or periodic shaving during the postoperative period may not be helpful in several cases. This brings up the theory of congenital natal cleft dimple instead of the acquired disease theory, which is supported with the presence of PSD in females having very few hairs on her body and in patients with irrelevant occupation with continuous relapses.

There are controversies in the literature about the best surgical technique in terms of postoperative complication and recurrence rate. A meta-analysis comparing open wound healing with primary closure showed that the recurrence risk was 58% lower in the open surgical technique (4% and 11.7%, respectively), probably due to reduced tension at the surgical site (14). If we divide primary closure techniques, recurrence rate is significantly higher in midline closure as compared to off midline closure techniques (1.4% and 10.3%, respectively) (14). Nevertheless, each PSD surgical or non-surgical management has opponents and supporters in the literature. Limited surgeries like sinus excision or unroofing and curettage have also been advised with low recurrence rate and early return to work (15, 16).

The time to "returning to work" is not as easy to estimate as we think as surgeons. Surgical recovery level is not the sole determinant to return to work for all patients. In other words, characteristics of their duty, their working environment, receptiveness of the boss to the patients' physical limitations etc. are also strong determinants for returning to work, and they may obscure or overpower the impact of the type of surgery. Surgical techniques that leave the diseased site open obviously lead to delayed returning to work. Patients with a suitable job or patients working in their own business are more likely to turn back to work earlier than the others.

Although the most commonly selected type of surgery in our study was excision and primary midline closure, the recur-

rence rate was significantly higher. Interestingly, once a recurrence was detected surgeons have shifted from this surgery to flap reconstruction methods for the 2nd intervention and vice versa. There seems to be a tendency to become more conservative for the 2nd intervention when the 1st intervention was aggressive such as flap reconstruction surgery. On the other hand, if the 1st intervention was conservative then the procedures were more aggressive in recurrent cases. Opting for limited surgical approaches after flap reconstructions were frequent in our study. The reason for this approach is probably the belief that repeated flap maneuvers are less promising. However, rhomboid or Karydakias flaps are favorable and convenient choices for rPSD as well (17, 18).

Pain scores after the 1st and 2nd operations did not differ significantly. Moreover, unexpectedly low pain scores may be detected in flap reconstructions since some patients experienced flap numbness in the postoperative period. This can be a matter of preference of flap reconstruction surgery for primary or rPSD.

The diameter and the number of the sinus tracts, volume of the excision material are also found to be important parameters for recurrence even if an R₀ resection was obtained (19, 20).

We did not compare the excision material volumes, the number and diameter of the sinus tracts with non-recurrent cases since recordings of these parameters were unreliable in our database.

Answers to our questionnaire clearly displayed the disease status after 2nd operation. The first item stands for complete cure after surgery, while the second stands for a disease which is cured but still creating ongoing discomfort, probably due to anatomic changes and sequel after two operations such as fibrosis. There may be a limited number of patients in this two answer groups who will probably present with PSD again in the future. Items three, four and five reflect an ineffective treatment. Patients with these answers are candidates for a third intervention in the future, and should be considered different from the patients with answers one and two. Patients with different operation types for 1st and 2nd interventions had more satisfaction than patients with the same operation in both in-

terventions. We speculate that any given type of surgery with unsatisfactory result should divert us to choose another type of surgery for the following operations. Since the interval between the onset of complaints and surgery before the 1st and 2nd operations were significantly different, this reflects that patients have much more reservation for a 2nd operation than the 1st one. Patients with rPSD take much longer than those with primary disease for the decision to apply for another operation.

The patients without a “well-being” period between the 1st and 2nd operations should be differentiated from others. We believe that they should not be called rPSD. Their surgery should be called as “re-operative surgery” since the primary disease was not cured at all. They should be referred as wound healing failure cases. Recurrent cases after excision and primary midline closure operation should be called as rPSD. Finally, rPSD after flap reconstruction surgeries and with a postoperative well-being period should be called as “second primary” disease. Namely we speculated to divide rPSD into three categories as 1: Relapsing PSD, 2: Recurrent PSD, and 3: Second primary PSD.

Although spending great effort, we could only reach two thirds of all rPSD cases. The data of non-contacted patients may change the results of our study. The fact that all cases who denied to participate were all female may augment this topic. The pain score registry was created a long time after the operation, which may have caused differences in pain perception than the actual peri-operative period.

CONCLUSION

Either primary or recurrent, PSD frequently effects young males and creates significant delay in returning to work in the population. The recurrence rate is very high, and predisposing factors should be taken into consideration as well as surgical approach preferences. Surgical excision and lay open technique for secondary healing seems to produce the best result in terms of recurrence rate. Repeated episodes of PSD are heterogeneous and somehow should be classified as relapsing, recurrent or second primary PSD. Favorable results can be achieved with flap reconstruction techniques for recurrent and second primary PSD. Relapsing PSD should be considered as management or follow-up failure since the patient never healed at all, and if reoperation is to be considered then the preferred surgery type should be changed.

Ethics Committee Approval: Authors declared that the research was conducted according to the principles of the World Medical Association Declaration of Helsinki “Ethical Principles for Medical Research Involving Human Subjects”, (amended in October 2013).

Informed Consent: Written informed consent was not obtained since patients were interviewed with phone call without face to face conversation.

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REFERENCES

1. Doll D, Krueger CM, Schrank S, Dettmann H, Petersen S, Duesel W. Timeline of recurrence after primary and secondary pilonidal sinus surgery. *Dis Colon Rectum* 2007; 50: 1928-1934. [\[CrossRef\]](#)
2. Doll D. 5- and 10-year recurrence rate is the new gold standard in pilonidal sinus surgery benchmarking. *Med Princ Pract* 2010; 19: 216-217. [\[CrossRef\]](#)
3. Yoldas T, Karaca C, Unalp O, Uguz A, Caliskan C, Akgun E, et al. Recurrent pilonidal sinus: lay open or flap closure, does it differ? *Int Surg* 2013; 98: 319-323. [\[CrossRef\]](#)
4. Kaymakcioglu N, Yagci G, Simsek A, Unlu A, Tekin OF, Cetiner S, et al. Treatment of pilonidal sinus by phenol application and factors affecting the recurrence. *Tech Coloproctol* 2005; 9: 21-24. [\[CrossRef\]](#)
5. Eryilmaz R, Sahin M, Alimoglu O, Dasiran F. Surgical treatment of sacrococcygeal pilonidal sinus with the Limberg transposition flap. *Surgery* 2003; 134: 745-749. [\[CrossRef\]](#)
6. Cihan A, Ucan BH, Comert M, Cesur A, Cakmak GK, Tascilar O. Superiority of asymmetric modified Limberg flap for surgical treatment of pilonidal disease. *Dis Colon Rectum* 2006; 49: 244-249. [\[CrossRef\]](#)
7. Cihan A, Menten BB, Tatlicioglu E, Ozmen S, Leventoglu S, Ucan BH. Modified Limberg flap reconstruction compares favourably with primary repair for pilonidal sinus surgery. *ANZ J Surg* 2004; 74: 238-242. [\[CrossRef\]](#)
8. Menten BB, Leventoglu S, Cihan A, Tatlicioglu E, Akin M, Oguz M. Modified Limberg transposition flap for sacrococcygeal pilonidal sinus. *Surg Today* 2004; 34: 419-423. [\[CrossRef\]](#)
9. Sondenaa K, Andersen E, Nesvik I, Soreide JA. Patient characteristics and symptoms in chronic pilonidal sinus disease. *Int J Colorectal Dis* 1995; 10: 39-42. [\[CrossRef\]](#)
10. Lesalnieks I, Furst A, Rentsch M, Jauch KW. Primary midline closure after excision of a pilonidal sinus is associated with a high recurrence rate. *Chirurg* 2003; 74: 461-468.
11. Kapan M, Kapan S, Pekmezci S, Durgun V. Sacrococcygeal pilonidal sinus disease with Limberg flap repair. *Tech Coloproctol* 2002; 6: 27-32. [\[CrossRef\]](#)
12. Al-Khamis A, McCallum I, King PM, Bruce J. Healing by primary versus secondary intention after surgical treatment for pilonidal sinus. *Cochrane Database Syst Rev* 2010; 1: CD006213. [\[CrossRef\]](#)
13. Onder A, Girgin S, Kapan M, Toker M, Arikanoglu Z, Palanci Y, et al. Pilonidal sinus disease: risk factors for postoperative complications and recurrence. *Int Surg* 2012; 97: 224-229. [\[CrossRef\]](#)
14. McCallum IJ, King PM, Bruce J. Healing by primary closure versus open healing after surgery for pilonidal sinus: systematic review and meta-analysis. *BMJ* 2008; 336: 868-871. [\[CrossRef\]](#)
15. Kement M, Oncel M, Kurt N, Kaptanoglu L. Sinus excision for the treatment of limited chronic pilonidal disease: results after a medium-term follow-up. *Dis Colon Rectum* 2006; 49: 1758-1762. [\[CrossRef\]](#)

16. Kepenekci I, Demirkan A, Celasin H, Gecim IE. Unroofing and curettage for the treatment of acute and chronic pilonidal disease. *World J Surg* 2010; 34: 153-7. [\[CrossRef\]](#)
17. el-Khadrawy O, Hashish M, Ismail K, Shalaby H. Outcome of the rhomboid flap for recurrent pilonidal disease. *World J Surg* 2009; 33: 1064-1068. [\[CrossRef\]](#)
18. Iesalnieks I, Deimel S, Schlitt HJ. Karydakís flap for recurrent pilonidal disease. *World J Surg* 2013; 37: 1115-1120. [\[CrossRef\]](#)
19. Aldean I, Shankar PJ, Mathew J, Safarani N, Haboubi NY. Simple excision and primary closure of pilonidal sinus: a simple modification of conventional technique with excellent results. *Colorectal Dis* 2005; 7: 81-85. [\[CrossRef\]](#)
20. Mentés O, Bağcı M, Bilgin T, Coskun I, Özgül O, Özdemir M. Management of pilonidal sinus disease with oblique excision and primary closure: results of 493 patients. *Dis Colon Rectum* 2006; 49: 104-108. [\[CrossRef\]](#)