UNROOFING AND CURRETAGE IS AN EFFECTIVE TREATMENT METHOD IN PATIENTS WITH PILONIDAL SINUS DISEASE

Running Title: A successful technique for pilonidal sinus

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Abstract

Purpose: Pilonidal sinus is a chronic disease with important morbidity.There is no gold standart treatment up to date.The aim of this study is to report results of unroofing and curettage technique in pilonidal sinus surgery.

Material and Methods: The data of patients who were operated with unroofing and curettage technique were collected retrospectively. Patients' age, gender, body mass index (BMI), duration of symptoms, presence of abscess in preoperative period, antibiotic usage and drainage, operation findings, postoperative complications, wound healing time, recurrences were recorded. NCSS (Number Cruncher Statistical System) 2007 (Kaysville, Utah, USA) program was used for statistical analysis.

Results: A total of 172 patients who underwent unroofing and curretage during 3 years period were studied retrospectively. There were 146 (84.9%) male and 26 (15.1%) female patients. The mean operation time was 18.52 ± 12.49 minutes (5-90 min). Postoperative infection rate was 2.9% (n = 5) and bleeding rate was 1.7% (n = 3). Recurrence was found in 13 of the patients (7.6%). Return to work was ranged from 0 to 90 days with an average of 14.41 ± 13.10 days.

Conclusion: Unroofing and curettage technique can be used under local anesthesia with outpatient basis. It can be prefered as a first line treatment modality in pilonidal sinus surgery.

Keywords:Pilonidal sinus,unroofing and curretage,recurrence

INTRODUCTION

Pilonidal sinus (PS) is a chronic, inflammatory disease characterized by involvement of the skin and subcutaneous tissue of the sacrococcygeal region (1).It may also detected rarely in other parts of the body. The term "pilonidal sinus" was first used by Hodges in 1880 (2).The Latin words "pilus" and "nidus" mean "hair nest" (3). PS is common in male, young adults. Although etiology has not been fully elucidated, deep natal cleft, obesity, genetic factors, hirsutism, smoking, local trauma and sedentary lifestyle have been accused in disease formation (4,5). Optimal treatment of PS has been discussed for years (6). Many surgical methods including excision and primer closure, closure of the defect with advancement flaps, secondary healing, marsupialisation, phenol injection have been used frequently in the treatment of PS. There is still debate about the gold standart treatment for disease. The method that used in the treatment of pilonidal sinus should be easy to perform, minimal invasive with short hospital stay and associated with early return to work. It is also important that the treatment method should have a low recurrence rate.

In this study, unroofing and curretage technique has been performed for patients with PS. The results of this simple technique were reported.

MATERIAL AND METHODS

Retrospective data of patients who were operated with the diagnosis of pilonidal sinus was studied. Patients' age, gender, body mass index (BMI), duration of symptoms, presence of

abscess in preoperative period, antibiotic usage and drainage, operation findings, postoperative complications, wound healing time, recurrences were recorded.All patients were operated with unroofing and curretage technique.

Surgical procedure

Operations were performed under local anesthesia in the outpatient basis with operating room conditions. Written consent was taken from the all patients. The intergluteal region was shaved the day before surgery.The patients were operated in prone position. Povidine iodine was used to clean the operative area. The local anesthetic agent (Citanest, (2% Prilocaine HCl) was applied to the skin and subcutaneous tissue . The sinus tracts was probed and opened with the help of mosquito and cautery. Hair and granulation tissue in the sinus tracts were removed by mechanical debridement with a dry gauze or a curette. The lateral wall of the sinus and the base were left intact. Marsupialization was not applied. Hemostasis was performed with the help of cautery **(Figure 1-4)** . After the wound was dressed again with a bubble gauze, the wound was covered with wet gas. The patient was kept under observation for about half an hour. The patient was checked for any active bleeding through this time and sent back home.The patients were followed up until wound healing **(Figure 5-6)**.

Figure 1:Opening sinus tracts with clamp

Figure 2:Electrocautery was used to open sinus tract

Figure 3:Opened sinus tracts were cleaned with gauze

Figure 4:The last appreance of surgical wound

Figure 5:The appreance of wound in 7.postoperative day

Figure 6:The appreance of wound in 12. postoperative day

Statistical Analysis: NCSS (Number Cruncher Statistical System) 2007 (Kaysville, Utah, USA) program was used for statistical analysis. Student t test was used for two group comparisons and Mann Whitney U test was used for two group comparisons of normal distributions in the comparison of descriptive statistical methods (Mean, standard deviation, median, frequency, ratio, minimum, maximum) as well as quantitative data . Fisher's Exact test was used for comparison of qualitative data. Differences were accepted as significant at P value < 0.05

RESULTS

A total of 172 patients who underwent unroofing and curretage were studied retrospectively. There were 146 (84.9%) male and 26 (15.1%) female patients. The ages of the patients ranged from 16 to 60 , mean 27.59 ± 8.62. The demographic characteristics of the patients are shown in (**Table 1)**. The duration of symptoms ranged from 10 days to 10 years with a mean of 18.00 ± 27.29 months. Patient characteristics in the preoperative period are shown in (**Table 2)**. The mean duration of the procedure was 18.52 ± 12.49 minutes (5-90 min). Postoperative infection rate was 2.9% (n = 5) and bleeding rate was 1.7% (n = 3) **(Table 2).** Recurrence was found in 13 of the patients (7.6%) **(Figure 7)**. The time to return to work ranged from 0 to 90 days with an average of 14.41 ± 13.10 days. Other parameters of the patients in postoperative period are summarized in (**Table 3)**. When the satisfaction of the operation is examined; 94.2% (n = 162) of the patients recommended surgery. **(Figure 8).** There was no correlation between recurrence and some descriptive features such as BMI, symptom duration (p> 0.05). It is noteworthy that the recovery time of non-recurrent cases is lower than recurrent cases **(Table 4)**.

Table 1. Demographic characteristics of patients

Age	**Min-Max (Median)**	**16-60 (26)**
	Mean±SD	**27,59±8,62**
Gender; n (%)	**Male**	**146 (84,9)**
	Female	**26 (15,1)**
BMI (kg/m^2)	**Min-Max (Median)**	**18-42 (26)**
	Mean±SD	**26,69±4,03**

Table 2: Distrubition of preoperative parameters and postoperative complications

Duration of symptoms (Month)	**Min-Max (Median)**	**0,3-120 (8)**
	Mean±SD	**18,00±27,29**
Discharge; n (%)	**No**	**29 (16,9)**
	Yes	**143 (83,1)**
Antibiotic usage; n (%)	**No**	**89 (51,7)**
	Yes	**83 (48,3)**
Abscess drainage; n (%)	**No**	**137 (79,7)**
	Yes	**35 (20,3)**
Wound Infection; n (%)	**No**	**167 (97,1)**
	Yes	**5 (2,9)**
Hemorrhage; n (%)	**No**	**169 (98,3)**
	Yes	**3 (1,7)**
Wound healing (Day)	**Min-Max (Median)**	**7-365 (30)**
	Mean±SD	**39,65±48,47**

Table 3: Follow up and postoperative parameters

Follow-up (Month)	**Min-Max (Median)**	**7-38 (17,5)**
	Mean±SD	**19,05±8,02**
Return to work (Day)	**Min-Max (Median)**	**0-90 (14)**
	Mean±SD	**14,41±13,10**
Sitting toilet without pain (Day)	**Min-Max (Median)**	**0-75 (2)**
	Mean±SD	**5,77±11,15**

Sitting without pain (Day)	**Min-Max (Median)**	**0-240 (6)**
	Mean±SD	**13,67±27,18**
Walking without pain (Day)	**Min-Max (Median)**	**0-75 (2)**
	Mean±SD	**6,62±12,34**

Tablo 4: Evaluation of risk factors for recurrence

		Recurrence (-) (n=159)	**Recurrence (+) (n=13)**	***p***
BMI (kg/m^2)	**Min-Max (Median)**	**18-42 (26)**	**20-37 (27)**	***[a]0,432***
	Mean±SD	**26,62±3,99**	**27,54±4,52**	
Symptoms (month)	**Min-Max (Median)**	**0,3-120 (8)**	**0,3-120 (8)**	***[b]0,979***
	Mean±SD	**17,78±26,87**	**20,71±33,16**	
Preoperative abscess; n (%)	**No**	**51 (32,1)**	**2 (15,4)**	***[c]0,349***
	Yes	**108 (67,9)**	**11 (84,6)**	
Preoperative drainage; n (%)	**No**	**125 (78,6)**	**12 (92,3)**	***[c]0,471***
	Yes	**34 (21,4)**	**1 (7,7)**	
Duration of wound healing	**Min-Max (Median)**	**7-365 (30)**	**7-180 (30)**	***[b]0,235***
	Mean±SD	**38,43±48,11**	**54,46±52,43**	

[a]Student t Test ***[b]Mann Whitney U Test*** ***[c]Fisher's Exact Tes***

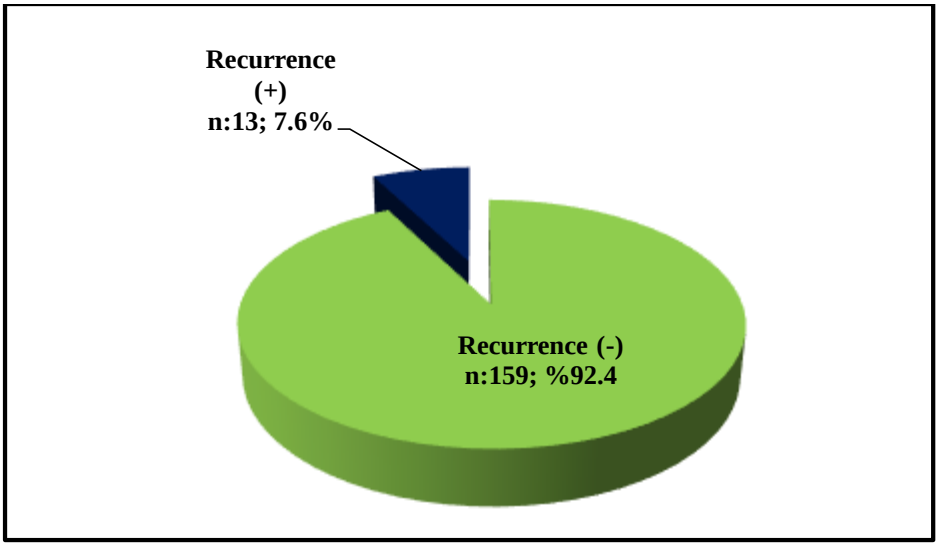

Figure 7: Total number of recurrence counts and rates

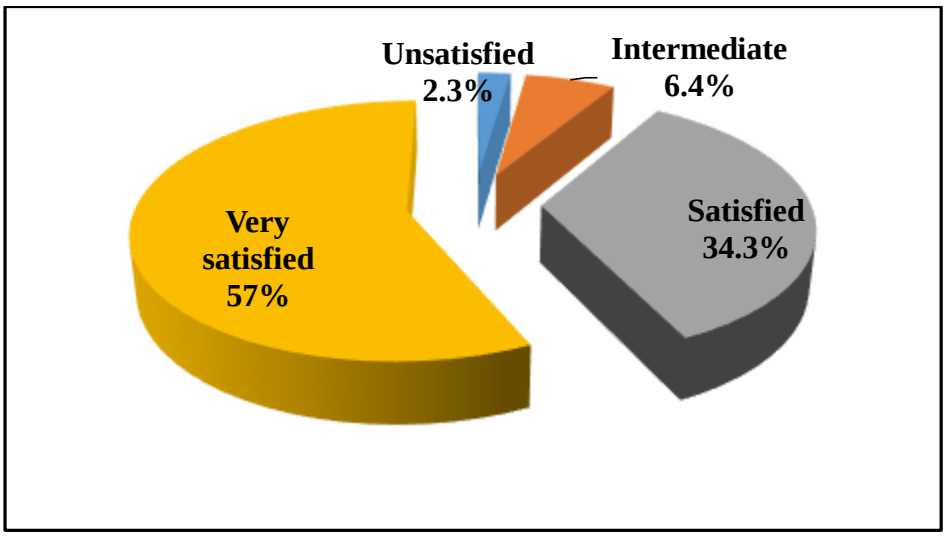

Figure 8: Patient satisfaction assessments

DISCUSSION

Pilonidal sinus disease is the chronic pathology associated with inflammation of skin and subcutaneous tissue. It often affects young, adolescent men (7). This disease is also found in the anatomical regions such as the fingers, umbilicus and axilla . The incidence of pilonidal sinus disease varies between breeds. The disease is more common in Mediterranean races, but relatively low in Africans and Asians (8,9). Chronic irritation, obesity, genetic factors have been accused in the etiology. Pilonidal sinus disease is associated with complaints such as discharge, pain and abscess formation in the intergluteal region. In a significant proportion of patients, complaints decrease the quality of life (10, 11). In particular, delay in wound healing and recurrences are main problems in pilonidal sinus surgery. Insufficient excision of any sinus tract in surgical procedure, postoperative wound infections, inadequate hygiene and wound care increase the risk of recurrence.

Many different methods have been described in pilonidal sinus surgery. The surgical procedure should be minimally invasive and the patient should have a short recovery period. A low recurrence rate is a basic goal. In the literature, pilonidal sinus therapy is a procedure in which sinuses are left partly or completely open after excision completely closed methods are defined. Exposed methods include excision and wound clearance, excision and marsupialization and unroofing techniques. In our study, a minimally invasive technique, unroofing, is applied to the curettage of the remaining cavity by deep cautery covering the sinus. In this method, tissue loss is minimized with a small wound (12). Closed methods involve closing the wound after sinus excision. In this group, surgical techniques vary according to the way the wound closes. The resulting defect can be closed with the help of the primer on the side. Advocates of surgical excision and primer closure emphasize faster recovery time, less postoperative follow-up, and shorter time to return to work (13, 14, 15). However, it has been reported that the chances of infection in excision and primer-closure wounds are much higher (16). The incidence of wound dehisence after excision and primary repair is much higher than previously thought (17, 18). As a result, these procedures can indirectly extend hospital stay and return to work (19).

The surgical technique we applied in this study has different names such as unroofing, deroofing, lay open and curettage in the literature (20,21). Garq P and colleagues applied

unroofing technique to 33 patients. Patients were diagnosed with chronic pilonidal sinus and/or pilonidal abscess. Approximately 97% of these patients were successfully treated with their technique (22). They concluded that unroofing was easy to apply. It can be performed without hospitalization under local anesthesia . The recurrence rate was low. The cosmetic results were satisfactory. The main disadvantage of this technique was relatively long wound healing time. Kepenekci et al. (21) applied unroofing and curettage techniques to 297 patients; They defined the procedure as a successful, easy to implement and cost effective. According to the authors, this technique seems to be applicable with low recurrence rates in chronic disease, abscess formation and recurrent disease (2.7%, 0%, 0%, respectively). However, even with these successful results, the average wound healing time was 5.4 weeks. Gencosmanoglu R et al compared the modified lay-open (incision, curettage, partial lateral wall excision and marsupialization) and total excision with primary closure in the treatment of pilonidal sinus disease (12).A total of 142 patients were operated with these techniques. Postoperative morbidity and recurrence rates were significantly lower in patients operated with modified lay open technique (2.7/13%, P value=0.028 and 1.4/17.4%, P value<0.001 respectively). The median time for return to work was was shorter in modified lay open group . The median healing time in modified lay open group was significantly longer than in primary closure group (7 [range 3--16] weeks vs. 2 [range 2--9] weeks; P value<0.001).

In this study, patients operated with unroofing and curettage technique were studied in a period of approximately 3 years.There were simple and complicated cases (recurrent and multichannel). All procedures were performed under local anesthesia, without hospital admission.This is the major advantage of unroofing and curretage technique.There were minimal postoperative complication (infection 5/2.9%, hemorrhage 3/1.7%) in our serial.Functional postoperative parameters such as sitting normally or toilet without pain, walking without pain were in acceptable time.As a minimal invasive technique, these results were associated with early return to work.The satisfaction with unroofing and curretage was high.The main disadvantage of the technique was that relatively long time of wound healing.The mean wound healing time was found approximately 39 days. The recurrence rate in this study was 7.6%. The rate is acceptable in pilonidal sinus surgery.We also analyzed

the possible risk factors for recurrence.There were no statistically significant difference for BMI, history of preoperative abscess drainage,long wound healing time in between recurrent and non-recurrent cases

In conclusion, unroofing and curettage technique can be used under local anesthesia with outpatient basis.It is cost effective.It is related with easy to perform, short operation time, small wound, easy postoperative care, low complication and high success rates.This technique can be prefered as a first line treatment modality in pilonidal sinus surgery.

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REFERANCES

1- Duman K, Gırgın M, Harlak A. Prevalence of sacrococcygeal pilonidal disease in

Turkey. Asian J Surg. 2017 ;40:434-437.

2- Hodges RM. Pilonidal sinus. Boston Med Surg J. 1880; 103: 485-486.

3-McCallum IJD, 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.

4-Søndenaa K, Anderson E, Soreide JA. Morbidity and shortterm results in a randomised controlled

trial of open compared to closed treatment of chronic pilonidal sinus. Eur J Surg 1992;158:351–355.

5-Doll D, Matevossian E, Wietelmann K, Evers T, Kriner M, Petersen S. Family history of pilonidal

sinus predisposes to earlier onset of disease and a 50% long-term recurrence rate. Dis Colon Rectum

2009;52:1610–1615.

6) Mayo O. Observations on injuries and diseases of the rectum. London: Burgess and Hill, 1833

7) Franckowiak JJ, Jackman RJ. The etiology of pilonidal sinus. Dis Colon Rectum.1962; 5:28–36.

8) Allen-Mersh TG. Pilonidal sinus: finding the right track for treatment. Br J Surg. 1990;77:123-132.

9) Karydakis GE. New approach to the problem of pilonidal sinus. Lancet. 1973;22:1414-5.

10) Søndenaa K, Pollard ML. Histology of chronic pilonidal sinus. APMIS 1995;103:267–272.

11) Lorant T, Ribbe I, Mahteme H, Gustafsson UM, Graf W. Sinus excision and primary closure

versus laying open in pilonidal disease: a prospective randomized trial. Dis Colon Rectum 2011;

54:300–305.

12) Gencosmanoglu R, Inceoglu R. Modified lay-open (incision, curettage, partial lateral wall excision

and marsupialization) versus total excision with primary closure in the treatment of

chronic sacrococcygeal pilonidal sinus: a prospective, randomized clinical trial with a complete two-

year follow-up. Int J Colorectal Dis 2005;20:415–422.

13) Perruchoud C, Vuilleumier H, Givel JC. Pilonidal sinus: how to choose between excision and

open granulation versus excision and primary closure? Study of a series of 141 patients operated on

from 1991 to 1995. Swiss Surg 2002; 8: 255-258.

14) Chiedozi LC, Al-Rayyes FA, Salem MM, Al-Haddi FH, Al-Bidewi AA.Management of pilonidal

sinus. Saudi Med J 2002; 23: 786-788.

15) Aydede H, Erhan Y, Sakarya A, Kumkumoglu. Comparison of three methods in

surgical treatment of pilonidal disease. Aust N Z J Surg 2001; 71: 362-364.

16) Miocinovic M, Horzic M, Bunoza D. The treatment of pilonidal disease of the

sacrococcygeal region by the method of limited excision and open wound healing. Acta Med Croatica

2000;54: 27-31.

17) Zieger K. Complications after surgery for pilonidal cyst. An introduction to a

new debate on a "costly" disease. Ugeskr Laeger 1999; 161: 6056-6058.

18) Lee HC, Ho YH, Seow CF, Eu KW, Nyam D. Pilonidal disease in Singapore:

clinical features and management. Aust N Z J Surg 2000; 70: 196-198.

19) Destito C, Romagnoli A, Pucello D, Mercuri M, Marin AW. Pilonidal sinus:

long term results of excision and closure technic. Review of the literature. G Chir 1997; 18: 441-446.

20-Lorant T, Ribbe I, Mahteme H, Gustafsson UM, Graf W. Sinus excision and primary closure

versus laying open in pilonidal disease: a prospective randomized trial. Dis Colon Rectum.

2011;54:300–305.

21- Kepenekci I, Demirkan A, Celasin H, Gecim IE. Unroofing and curettage for the treatment of

acute and chronic pilonidal disease. World J Surg. 2010;34:153–157.

22-Garg P, Garg M, Gupta V, Mehta SK, Lakhtaria P. Laying open (deroofing) and curettage under local anesthesia for pilonidal disease: An outpatient procedure. World J Gastrointest Surg. 2015.27;7:214-8.