

Comparison of Limberg flap and excision and primary closure of pilonidal sinus disease, in terms of quality of life and complications

Ahmet Serdar Karaca, Rıdvan Ali, Muzaffer Çapar, Sezar Karaca¹

Department of General Surgery, Bartın State Hospital, Bartın, ¹Bartın University Faculty of Science Faculty of Economic and Administrative Sciences, Bartın, Turkey

Purpose: The aim of this study was to compare two different treatment methods for pilonidal sinus with respect to complications, recurrence, and patient quality of life.

Methods: Five hundred forty-nine patients who underwent surgery for pilonidal sinus between January 2007 and August 2012 were included in this study. The patients were classified into group I (excision and primary closure) and group II (Limberg flap).

Results: There was no significant difference in the mean age and gender of the patients between groups I and II ($P = 0.512$ and $P = 0.472$). The duration of surgical operation was lower in group I ($P < 0.001$). There was no significant difference in hospitalization time after surgery, minor complications, and recurrence between the groups ($P = 0.674$, $P = 1.000$, and $P = 1.000$, respectively). The time required for pain-free walking, urinating, and returning to work was significantly lower in group II ($P < 0.001$, $P < 0.001$, and $P < 0.001$, respectively). The patients in group I stated that they were more satisfied in terms of aesthetics ($P < 0.001$).

Conclusion: According to the results of this study, Limberg flap method has better outcomes compared with excision and primary closure. Therefore, we recommend Limberg flap for treatment of pilonidal sinus disease.

INTRODUCTION

Pilonidal sinus is a common disease of the sacrococcygeal region that generally affects young males. While various methods have been described for the treatment of pilonidal sinus, there is an ongoing debate regarding the best treatment method. The ideal treatment for pilonidal sinus should ensure low pain, short hospitalization period, low risk of complication, rapid return to normal activities, and should have a low recurrence rate [1,2]. While excision and primary closures have certain advantages, including shorter surgery time and shorter hospitalization time, flap methods are expected to have lower recurrence rates. The aim of the current study was to compare the complications, recurrence rates, time required to return to normal activities, and patient satisfaction in patients who underwent two different surgical operations for pilonidal sinus retrospectively.

METHODS

Five hundred forty-nine patients who underwent surgery for pilonidal sinus between January 2007 and August 2012 were included in this study. For each patient, approval from the local ethics committee and informed consent forms were

Corresponding Author

Ahmet Serdar Karaca
Department of General Surgery, Bartın State Hospital, Omertepesi Mah Kanlıirmak St., Bartın, Turkey
Tel: +90-312-5656096
Fax: +90-3782273657
E-mail: karacaahmetserdar@gmail.com

Key Words

Complication, Quality of life, Pilonidal sinus

Received May 22, 2013
Revised July 12, 2013
Accepted July 16, 2013

J Korean Surg Soc 2013;85:236-239
<http://dx.doi.org/10.4174/jkss.2013.85.5.236>

Copyright © 2013, the Korean Surgical Society

© Journal of the Korean Surgical Society is an Open Access Journal. All articles are distributed under the terms of the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/3.0/>) which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

obtained. Patients who received excision and primary closure (group I) and Limberg flap (group II) as the surgical method were included in the study. The patients' medical records were retrospectively evaluated. The patients were contacted via phone. The surgical methods were compared with respect to the duration of the operation, pain-free walking after the operation, pain-free sitting on the toilet and time to return to work. Patients who previously underwent surgery for pilonidal sinus, who had recurrence, who were not reached, and who were given other surgical methods were excluded from the study. Patient satisfaction was evaluated by scoring their answers according to the following scheme: poor (1), good (2), and very good (3) [3].

SPSS ver. 17.0 (SPSS Inc., Chicago, IL, USA) was used for statistical analysis. The Kolmogorov-Smirnov test was used to evaluate the fitness of continuous variables to the normal distribution. The Mann-Whitney U test was used to compare the groups as the variables that did not fit the normal distribution. Fisher exact chi-square test was used to compare categorical data. A P-value < 0.05 were considered statistically significant.

RESULTS

The mean age of 549 patients included in the study was 25.01 ± 11.02 years. The male-female ratio was 5/1 (84.3%). The group I consisted of 315 patients (57.3%) and group II consisted of 234 patients (42.7%). The mean follow-up period was 58.36 ± 46.79 months for group I and 36.61 ± 28.11 months for group II. The mean age in group I was 25.04 ± 8.80 years and 25.40 ± 8.09 years in group II, and there was no significant difference in age between the two groups ($P = 0.494$). The mean operation time was 27.26 ± 6.41 minutes for

group I and 59.64 ± 7.76 minutes for group II ($P < 0.001$). The mean hospitalization time was 3.05 ± 3.42 days for group I and 2.69 ± 2.32 days for group II, and the observed difference was not statistically significant ($P = 0.698$). Minor complications such as wound site infection, seroma and wound opening was observed in 56 patients (17.8%) in group I, and 42 patients (17.9%) in group II, and the observed difference was not statistically significant ($P = 1.000$). Twenty-nine patients (9.2%) in group I and 16 patients (7.1%) in group II had recurrence. While the recurrence rate was higher in group I, the observed difference was not statistically significant ($P = 1.000$) (Table 1).

Evaluation of the groups with respect to pain and patient satisfaction after surgery

The time required for pain-free walking after surgery was 25.72 ± 8.51 days in group I and 12.36 ± 3.74 days in group II, and the observed difference was statistically significant ($P < 0.001$). The time required to achieve pain-free sitting on the toilet was 28.54 ± 6.71 days in group I and 14.72 ± 5.47 days in group II, and the observed difference was statistically significant ($P < 0.001$). The time required to return to work was 33.25 ± 7.42 days in group I and 16.31 ± 3.86 days in group II, and the observed difference was statistically significant ($P < 0.001$). When the groups were compared in respect to patient satisfaction, group I received 2.43 ± 0.34 points and group II received 1.88 ± 0.26 points; the patients in group I were more satisfied in terms of aesthetics ($P < 0.001$) (Table 2).

DISCUSSION

Despite the various treatment methods for pilonidal sinus surgery, there is still ongoing debate about the best treatment method. The major problems in the methods described thus far are complications, recurrence, and aesthetic outcome [3]. In case of complications, the recovery period is prolonged and this delays the patient's return to normal daily activities. Therefore, complication and recurrence rates are crucial parameters in evaluating the effectiveness of the

Table 1. Comparison of demographic and clinical data of the patients according to the groups

Variable	Group I	Group II	P-value
Age (yr)	25.04 ± 8.80	25.40 ± 8.09	0.494
Gender			
Male	273 (86)	189 (81)	
Female	42 (14)	45 (19)	
Operative time (min)	27.26 ± 6.41	59.64 ± 7.76	<0.001
Hospital stay (day)	3.05 ± 3.42	2.69 ± 2.32	0.698
Follow-up time (mo)	58.36 ± 46.79	36.61 ± 28.11	<0.001
Minor complications	56 (17.8)	42 (17.9)	1.000
Recurrence	29 (9.2)	16 (7.1)	1.000

Values are presented as mean \pm standard deviation or number (%). Group I, Excision and primary closure; Group II, Limberg flap.

Table 2. Comparison of patients with postoperative pain and satisfaction

Variable	Group I	Group II	P-value
Painless walking distance (day)	25.72 ± 8.51	12.36 ± 3.74	<0.001
Painless toilet seating (day)	28.54 ± 6.71	14.72 ± 5.47	<0.001
Starting work (day)	33.25 ± 7.42	16.31 ± 3.86	<0.001
Patient satisfaction	2.43 ± 0.34	1.88 ± 0.26	<0.001

Values are presented as mean \pm standard deviation. Group I, excision and primary closure; Group II, Limberg flap.

surgical method performed for pilonidal sinus. Regarding postoperative complications, Al-Khayat et al. [4] reported a minor complication rate of 11.7% and Polat et al. [5] reported a minor complication rate of 11%. There are reports of quite distinct values regarding the recurrence rate after surgical intervention in the literature. According to one study, the mean infection rate in the Limberg flap technique is 7.6% and the mean recurrence rate is 1.5% [6]. While Holmebakk and Nesbakken [7] reported a recurrence rate of approximately 20% after excision and primary closure and rhomboid flap; another study reports a recurrence rate of 3.84% after Limberg flap and 0% after excision and primary closure and claim that there is no statistical significance between the given methods [3]. On the other hand, Ertan et al. [8] determined a recurrence rate of 2% in the Limberg flap method and 12% in the primary closure method, and stated that the Limberg method resulted in a better outcome with respect to recurrence, complications, time required for wound healing, time required to return to work, and general health conditions. Similarly, Akca et al. [9] mentioned the advantages of Limberg flap method in their study. Literature findings generally state that flap methods are more advantageous in cases that present with complex and various defects after the excision [10–13]. Nursal et al. [13], on the other hand, compared V-Y advancement flap and excision and primary closure, and showed that there was no significant difference in postoperative complications, recurrence and patient satisfaction between these methods. In addition, when flap methods are compared, Karydakis and Limberg flap methods are suggested to be similar with respect to post-operative hospitalization period, complications, and recurrence [14]. In the current research, minor complications such as postoperative wound site infection, seroma, and wound opening were reported at a rate of 17.9% in patients who received excision and primary closure, while this rate was 16.7% in patients who received the Limberg flap.

When both surgical methods for minor complications were compared, similar rates were observed. In the current study, the mean follow-up period for all cases was 30 months, and the recurrence rates for primary closure and Limberg flap were 8.9% and 7.1%, respectively. There is no significant difference in complication and recurrence between the two methods ($P > 0.05$).

Other important points in the surgical treatment of pilonidal sinus are the hospitalization period, time required for the patient to return to work and daily activities, and patient's aesthetic satisfaction. When considered from this perspective, there was no statistical significance in the hospitalization period between the groups in the current study; on the other hand, time required to return to daily activities such as pain-free walking after the surgery, sitting on the toilet,

and return to work, was significantly shorter in the Limberg flap method. When considering the literature with respect to these parameters, Muzi et al. [3] compared the Limberg flap and primary closure in a retrospective study with 260 cases, and stated that postoperative pain was lower in the excision and primary closure, while there was no significant difference in the time required for return to work between the two groups. Similarly, a study by Ersoy et al. [15] stated that there was no difference in the time required to return to work between the Limberg flap and primary closure. On the other hand, Leventoglu et al. [16] demonstrated that the Limberg flap method was more advantageous compared to excision and primary closure with respect to hospitalization period and time required to return to work. Another crucial success criterion in surgery is patient's aesthetic satisfaction after surgery. Especially when flap methods are used for the treatment of pilonidal sinus surgery, the patients may have discomfort for aesthetic reasons. In the current study, it was observed that the patients who had primary repair after excision were more satisfied in terms of aesthetic outlook. On the other hand, the study by Akca et al. [9] demonstrates the superiority of the Limberg flap method in terms of quality of life after surgery. In the surgical treatment of pilonidal sinus, when evaluating the complication and recurrence rates after surgery, primary closure and Limberg flap methods have similar outcomes. While the duration of the surgery is shorter with excision and primary closure, the flap method is superior in terms of parameters including postoperative pain or time required to return to work. The patients seem to be more satisfied with the excision and primary closure method in terms of aesthetics.

In conclusion, according to the results of this study, Limberg flap method has better outcomes compared with excision and primary closure. Therefore, we recommend Limberg flap for treatment of pilonidal sinus disease.

CONFLICTS OF INTEREST

No potential conflict of interest relevant to this article was reported.

REFERENCES

1. 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;336:868–71.
2. Tocchi A, Mazzoni G, Bononi M, Fornasari V, Miccini M, Drumo A, et al. Outcome of chronic pilonidal disease treatment after ambulatory plain midline excision and primary suture. *Am J Surg* 2008;196:28–33.

3. Muzi MG, Milito G, Cadeddu F, Nigro C, Andreoli F, Amabile D, et al. Randomized comparison of Limberg flap versus modified primary closure for the treatment of pilonidal disease. *Am J Surg* 2010;200:9-14.
4. Al-Khayat H, Al-Khayat H, Sadeq A, Groof A, Haider HH, Hayati H, et al. Risk factors for wound complication in pilonidal sinus procedures. *J Am Coll Surg* 2007;205:439-44.
5. Polat C, Gungor B, Karagul S, Buyukakincak S, Topgul K, Erzurumlu K. Is oval flap reconstruction a good modification for treating pilonidal sinuses? *Am J Surg* 2011;201:192-6.
6. Unalp HR, Derici H, Kamer E, Nazli O, Onal MA. Lower recurrence rate for Limberg vs. V-Y flap for pilonidal sinus. *Dis Colon Rectum* 2007;50:1436-44.
7. Holmebakk T, Nesbakken A. Surgery for pilonidal disease. *Scand J Surg* 2005;94:43-6.
8. Ertan T, Koc M, Gocmen E, Aslar AK, Keskek M, Kilic M. Does technique alter quality of life after pilonidal sinus surgery? *Am J Surg* 2005;190:388-92.
9. Akca T, Colak T, Ustunsoy B, Kanik A, Aydin S. Randomized clinical trial comparing primary closure with the Limberg flap in the treatment of primary sacrococcygeal pilonidal disease. *Br J Surg* 2005;92:1081-4.
10. Katsoulis IE, Hibberts F, Carapeti EA. Outcome of treatment of primary and recurrent pilonidal sinuses with the Limberg flap. *Surgeon* 2006;4:7-10, 62.
11. Eryilmaz R, Sahin M, Alimoglu O, Dasiran F. Surgical treatment of sacrococcygeal pilonidal sinus with the Limberg transposition flap. *Surgery* 2003;134:745-9.
12. Bendewald FP, Cima RR. Pilonidal disease. *Clin Colon Rectal Surg* 2007;20:86-95.
13. Nursal TZ, Ezer A, Caliskan K, Torer N, Belli S, Moray G. Prospective randomized controlled trial comparing V-Y advancement flap with primary suture methods in pilonidal disease. *Am J Surg* 2010;199:170-7.
14. Can MF, Sevinc MM, Hancerliogullari O, Yilmaz M, Yagci G. Multicenter prospective randomized trial comparing modified Limberg flap transposition and Karydakias flap reconstruction in patients with sacrococcygeal pilonidal disease. *Am J Surg* 2010;200:318-27.
15. Ersoy OF, Karaca S, Kayaoglu HA, Ozkan N, Celik A, Ozum T. Comparison of different surgical options in the treatment of pilonidal disease: retrospective analysis of 175 patients. *Kaohsiung J Med Sci* 2007;23:67-70.
16. Leventoglu S, Ozdemir S, Ozgay N, Ege B, Menten B, Oguz M, et al. Comparison of primary closure with Limberg flap in the treatment of pilonidal disease. *Kolon Rektum Hast Derg* 2008;19:90-2.