

Comparison of different interval times of Limberg flap reconstruction after pilonidal sinus abscess

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Abstract. – OBJECTIVE: Pilonidal disease (PD) is a chronic inflammatory condition located in the natal cleft originating from the subcutaneous hair characterized by sinuses and painful cysts. PD has a wide symptom perspective, presenting different clinical findings and affecting the patient's quality of life in case of frequent recurrences. There is no definite consensus on when definitive treatment should be given after drainage of pilonidal abscess. In this study, it was aimed to evaluate the effect of the timing chosen for Limberg flap reconstruction after drainage of pilonidal abscess on the postoperative process and complications.

PATIENTS AND METHODS: This retrospective study includes patients with Limberg flap reconstruction performed after pilonidal abscess drainage between January 1, 2015 and January 1, 2019 at a private hospital in Adana, Turkey. The patients to whom Limberg flap reconstruction was offered were divided into two groups, according to interval times from the abscess drainage as <4 weeks (Group 1, 100 patients) and >4 weeks (Group 2, 32 patients).

RESULTS: Both groups, having a homogeneous distribution in terms of age, gender, and comorbidity, were compared in terms of return to work, complications, and recurrence. There was no statistical difference between the groups in terms of postoperative pain, individual complications, and recurrence ($p=0.999$). However, the time to return to work was longer in Group 1 ($p=0.012$).

CONCLUSIONS: Results suggest that there is no need to wait for a long time for elective surgery after drainage of pilonidal abscess, and that it can be safely performed when the interval time is less than 4 weeks.

Key Words:

Drainage, Interval, Limberg flap, Pilonidal abscess, Pilonidal disease.

Introduction

Pilonidal disease (PD) is a chronic inflammatory condition located in the natal cleft originat-

ing from the subcutaneous hair characterized by sinuses and painful cysts^{1,2}. Although congenital and acquired factors in the etiology have been reported, it has recently been accepted that it is largely acquired^{3,4}.

PD is thought to occur due to the foreign body reaction that occurs when the free hairs in the intergluteal region come into contact with the subcutaneous tissue. When combined with inadequate personal care, this reaction leads cysts and sinuses forming under the skin⁵. The disease has a wide symptom perspective, presenting different clinical findings such as asymptomatic sinuses, painful abscesses or chronic discharge disease. Frequent recurrences have a very bad effect on the patient's quality of life².

Although various non-surgical and surgical methods are recommended in the treatment of PD (crystallized phenol method, microsineusectomy, laser therapy, open technique, marsupialization, primary closure, flap procedures), all these methods have disadvantages and none of them can be defined as the gold standard yet. Limberg rhomboid flap is a surgical method that is technically easy to apply and has a low recurrence and complication rate⁶.

Treatment of acute pilonidal abscess is incision and drainage, but this form of treatment is not a definitive treatment. Recurrence develops in 40-60% of patients with abscess drainage⁷. There is no definite consensus in the literature regarding the timing of definitive treatment after pilonidal abscess. Although some sources advised up to 8 weeks wait after abscess cleaning, they did not specify a clear mechanism for this period⁸. The long interval of 8 weeks after abscess drainage facilitates the chronicity of the existing condition. On the other hand, surgical treatments applied in the very early period after abscess drainage have

a low chance of success because the inflammation does not end.

In this study, it was aimed to evaluate the effects of the interval between the time of Limberg flap reconstruction and drainage on postoperative surgical results as well as the healing process in patients who applied with acute abscess PD and underwent abscess drainage.

Materials and methods

Prospectively collected data of the patients in our clinic were analyzed retrospectively. Consent was obtained from all patients before undergoing surgery, including the use of patient data and disease photographs in educational and academic studies.

Between January 1, 2015 and January 1, 2019, 132 patients who were diagnosed with sacrococcygeal pilonidal sinus disease, had previous abscess drainage and underwent Limberg transposition flap reconstruction as surgical treatment were included in the study. The common feature of all 132 patients included in the study was abscess drainage. Limberg flap surgery was the main treatment. Patients who underwent non-surgical procedures or surgical procedures other than Limberg transposition flap reconstruction were excluded.

Limberg flap reconstruction was offered to the patients 4 weeks before and 4 weeks after the abscess drainage. All patients were followed up and treated by a single surgeon. The wound healing was followed through weekly clinic visits of the patients.

The time between the day of pilonidal abscess drainage and the date of Limberg flap reconstruction performed on the same patient was determined as the interval time. The patients were divided into two subgroups as shorter than 4 weeks (Group 1) and longer than 4 weeks (Group 2). Age, gender, interval time, history of smoking and concomitant disease, duration of operation, duration of mobilization, postoperative pain score, length of hospital stay, time to return to work, postoperative morbidities, recurrence status and postoperative follow-up period were recorded.

Surgical Technique

The surgical field was shaved on the day of the operation. Standard Limberg flap reconstruction was performed in the jackknife position under spinal anesthesia after surgical site cleaning. A rhombus covering the entire diseased tissue and

a lateral extension from its corner were preoperatively drawn with a sterile pencil. The superior and inferior angulation of the rhombus was 60 degrees, while its medial and lateral angulation was 120 degrees. Incision was made after prophylactic intravenous cephalosporin. The diseased area was excised in a rhombic shape, advancing up to the presacral fascia, and no diseased tissue was left behind. Afterwards, a fasciocutaneous flap was created to fit this rhombus, and after bleeding control, a number 7 Jackson pratt drain was placed in the site and the anatomical layers were closed 3 times with 3/0 vycril and 3/0 prolens (Figure 1).

Postoperative drainage was followed up. When the amount coming from the drain decreased below 25 cc, the drain was removed. All patients were discharged with oral antibiotics and analgesics. The therapy was extended whenever necessary during their first week control. Visual analog scale (VAS) was used for postoperative pain. Patients who scored 4 or higher VAS score at discharge were considered to have postoperative pain. It was recommended that they do daily dressing until they came to their first week controls. The dressing timings were rearranged according to the current wound condition in the controls. Apart from this wound care, it was recommended to clean their body hair periodically postoperatively. All patients were checked again in the outpatient clinic at the end of the 1st week, 1st month, 6th month and 1st year.

Statistical Analysis

IBM SPSS Statistics Standard Concurrent User V 26 (IBM Corp., Armonk, NY, USA) software was used to evaluate the data. Descriptive statistics were given as number of units (n), percent (%), median (M), interquartile range (IQR), minimum (min) and maximum (max) values. The Shapiro Wilk test of normality was used for the distribution of differences in numerical variables. Numerical variables according to interval time groups were compared with Mann-Whitney U-test. Categorical variables according to interval time groups were compared with Fisher's exact test. A *p*-value <0.05 was considered statistically significant.

Results

Limberg flap reconstruction surgery was performed in 132 patients who had pilonidal abscess drainage. The interval time in Group 1 (*n*=100 patients, 75.7%) was shorter than 4 weeks (28 days),

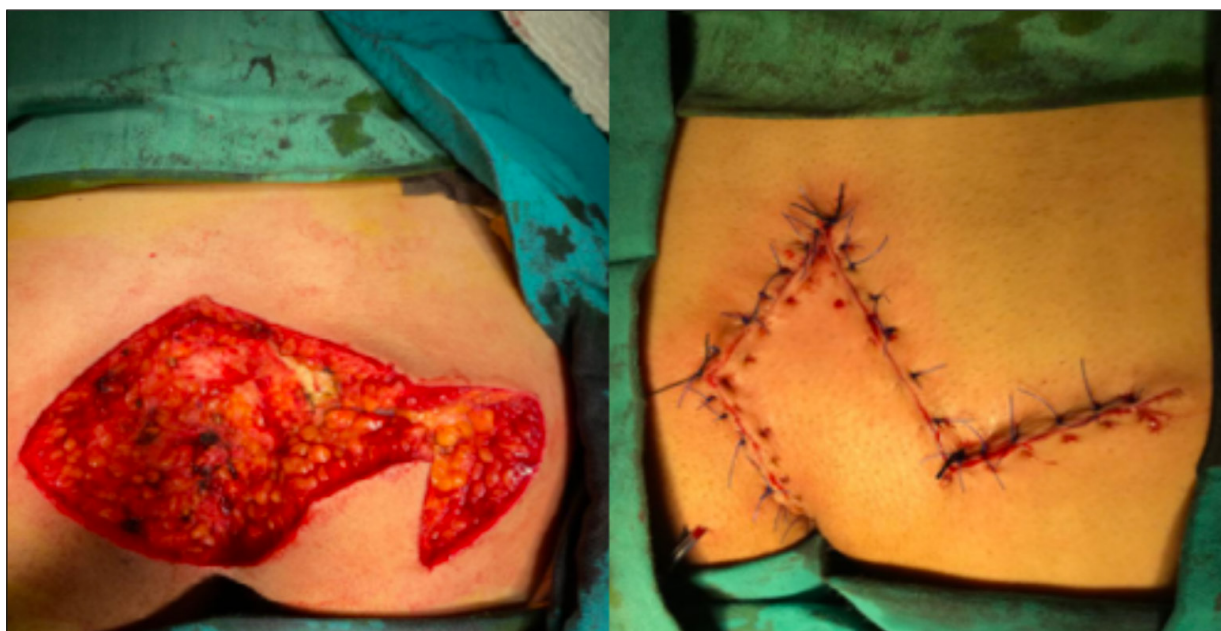


Figure 1. Photos of Limberg flap reconstruction steps.

and the interval time in Group 2 ($n=32$, 24.3%) was longer than 4 weeks. The age range of all patients was 14-60 years. 32 patients in Group 1 (32.0%) and 8 patients in Group 2 (25%) were women. Age and gender distribution of Group 1 and Group 2 patients showed similar distribution, and no statistical difference was observed between the groups ($p=0.102$ and $p=0.514$, respectively). The number of patients with additional disease in both groups was two ($p=0.247$). The number of smokers was 11 in Group 1 (11.0%) and 6 in Group 2 (18.8%) ($p=0.361$).

The median interval time was 18 days in Group 1 and 30.5 days in Group 2. Postoperative mobilization hours and hospital stay were similar in both groups, with no statistically significant difference ($p=0.843$ and $p=0.624$, respectively). The median time to return to work was 16 days in Group 1 (IQR=5) and 14 days in Group 2 (IQR=4.7). The time to return to work was found to be longer in Group 1 patients ($p=0.012$). Operative time and follow-up time were similar in the patients of both groups ($p=0.690$ and $p=0.887$, respectively).

Postoperative pain was reported in 11 patients of Group 1 (11.0%) and 4 patients of Group 2 (12.5%), suggesting no statistical difference between the groups ($p=0.999$). Regarding the morbidities, the rates of flap necrosis, itching, loss of sensation, wound dehiscence, and surgical site in-

fection were found to be similar between Group 1 and Group 2 ($p=0.999$, 0.186, 0.187, 0.679, and 0.194, respectively). Recurrence observed in Group 1 (5 patients, 5.0%) and Group 2 (one patient, 3.1%) were also similar ($p=0.999$). While the median equivalent of 5 recurrences was 8 months in Group 1, it was 11 months in Group 2. The demographic characteristics, postoperative processes, complications, and recurrence rates of the patients are summarized in Table I.

Discussion

In the treatment of acute pilonidal abscess, incision, and drainage of the abscess before flap reconstruction is the recommended treatment method⁹. The optimal time for flap reconstruction after incision and abscess drainage is uncertain. No study could be found during literature review reporting the optimal timing for Limberg flap after abscess drainage.

This study showed that different interval times between acute pilonidal abscess drainage and elective Limberg flap reconstruction did not affect complications and recurrence. Recurrence was observed in 6 of 132 patients (4.5%). The recurrence rate was 3.7% in Group 1 and 3.1% in Group 2. Although lower recurrence rates are reported in the literature, the recurrence rate in studies with a large

Table I. Comparison of baseline and complication data of Group 1 and Group 2 patients.

	Interval Group		Test Statistics	
	Group 1 n=100	Group 2 n=32	Test value	p-value
Age, (years)				
<i>M (IQR)</i>	24.0 (6.0)	26.0 (8.7)	<i>z</i> =1.636	0.102
<i>min-max</i>	14.0-60.0	16.0-60.0		
Gender, <i>n (%)</i>				
Male	68 (68.0)	24 (75.0)	$\chi^2=0.562$	0.514
Female	32 (32.0)	8 (25.0)		
Interval time				
<i>M (IQR)</i>	18.0 (9.0)	28.0 (1.7)	<i>z</i> =8.541	<0.001
Postop mobilization time				
<i>M (IQR)</i>	7.0 (2.0)	7.0 (2.0)	<i>z</i> =0.198	0.843
Hospital stay (day)				
<i>M (IQR)</i>	3.0 (2.0)	3.0 (1.7)	<i>z</i> =0.491	0.624
Returning work days				
<i>M (IQR)</i>	16.0 (5.0)	14.0 (4.7)	<i>z</i> =2.505	0.012
Surgery time (min)				
<i>M (IQR)</i>	53.0 (7.0)	52.0 (9.5)	<i>z</i> =0.399	0.690
Follow-up times (month)				
<i>M (IQR)</i>	15.0 (4.0)	14.5 (3.5)	<i>z</i> =0.142	0.887
Cigarette, <i>n (%)</i>				
Yes	11 (11.0)	6 (18.8)	$\chi^2=1.298$	0.361
No	89 (89.0)	26 (81.2)		
Additional disease, <i>n (%)</i>				
Yes	2 (2.0)	2 (6.2)	$\chi^2=1.490$	0.247
No	98 (98.0)	30 (93.2)		
Postoperative pain, <i>n (%)</i>				
Yes	11 (11.0)	4 (12.5)	$\chi^2=0.054$	0.999
No	89 (89.0)	28 (87.5)		
Complications, <i>n (%)</i> [†]				
FLAP necrosis	1 (1.0)	0 (0.0)	$\chi^2=0.322$	0.999
Itching	13 (13.0)	1 (3.1)	$\chi^2=2.493$	0.186
Loss of sensation	12 (12.0)	1 (3.1)	$\chi^2=2.151$	0.187
Wound dehiscence	7 (7.0)	1 (3.1)	$\chi^2=0.639$	0.679
Wound infection	7 (7.0)	0 (0.0)	$\chi^2=2.365$	0.194
Recurrence, <i>n (%)</i>				
Yes	5 (5.0)	1 (3.1)	$\chi^2=0.196$	0.999
No	95 (95.0)	31 (96.9)		

M: Median, *IQR*: Interquartile range, *min*: minimum, *max*: maximum, *z*: Mann-Whitney U test, χ^2 : Fisher exact test. [†]Each complication was evaluated independently.

number of patients was between 3.5-4.9%^{10,11}. The patients were evaluated in terms of recurrence in the postoperative sixth month and first year.

In terms of return to workday, Group 1 had a longer mean time to return to work and was consistent with the results of studies with a past return time in both groups¹².

Although the number of complications in Group 1 was higher, there was no statistical difference between the two groups in terms of complications. Complications outnumbered in Group 1 explain the significant difference in the number of days back to work between the two groups.

The proportion of patients presenting with acute abscess PD was approximately one in three¹³. Many of the patients who present with this abscess form become chronic in the long term and are candidates for surgical treatment. This process, from abscess formation to chronicity, affects patient comfort quite negatively. Repetitive abscess formation during the waiting period and interventional procedures for abscesses are also associated with increased cost rates¹⁴.

Various studies^{14,15} have reported that Limberg flap reconstruction is one of the most effective surgical treatment modalities in sacrococcygeal

PD. When flap reconstruction is planned in the treatment of PD, it is expected that the existing abscess should be evacuated first and the signs of infection regress¹⁶. Different studies comparing the application of the Limberg flap in the presence of acute abscess and its application after the abscess findings have regressed have reported that there may be advantages and disadvantages compared to each other. It is reported that Limberg flap reconstruction can be performed safely in PD with acute abscess, and it is not associated with an increased risk of complications or recurrence after surgery^{9,16}. However, in patients who develop pilonidal abscess for the first time, up to 60% success can be achieved after incision and drainage, and they can show a symptom-free and recurrence-free course for many years⁷. Therefore, direct treatment of pilonidal abscesses with Limberg flap reconstruction may be overtreatment. A study which compared the treatment methods of endoscopic PD treatment one day after admission and four weeks later, reported that the emergency endoscopic approach is safe¹⁷.

The recurrence rate of rhomboid excision was found to be lower than other methods, with less recurrence in the patient group with incision, in a 20-year follow-up study investigating recurrence in patients with and without incision drainage in the pilonidal sinus prior to definitive surgery¹⁸. But they left some questions unanswered, such as whether 2 or 8 weeks was the best interval for the lowest recurrence rate. Also, no results were presented for wound complications.

Conclusions

In this study, interval times after abscess drainage were grouped differently and it was revealed that flap reconstructions performed before 4 weeks and flap reconstructions performed after 4 weeks had acceptable results, and there was no difference between the two groups in terms of complications, postoperative pain, and recurrence.

Our study showed that there is no need for a long time wait for elective surgery after drainage of pilonidal abscess, and elective surgery can be safely performed when the interval time is less than 4 weeks. Further studies are needed to determine the timing of elective surgery.

Conflict of Interest

The authors have no conflict of interest to declare.

Acknowledgments

Authors would like to thank Professor Ferhan Elmalı for contributing to the statistical analysis.

Funding

The authors received no funding during the course of this study.

Informed Consent

Informed consent was obtained from all individual participants included in the study.

Ethics Approval

This retrospective study was conducted following the Ethical Principles of the Declaration of Helsinki and approved by Cukurova University Clinical Research Ethics Committee (No. 119 on 04/02/2022).

Authors' Contributions

Bulent Halaclar contributed to the conception and design of the study, acquisition of data, analysis and interpretation of data, drafting the article; validation and final approval of the version of the article to be published. Ozhan Cetindag contributed to the conception and design of the study, reviewing and editing the article; supervision; validation and final approval of the version of the article to be published.

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Data Availability Statement

The datasets generated and/or analyzed during the current study are available from the corresponding author upon request

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