



# Limberg Flap in the Treatment of Patients Presented with Sacrococcygeal Acute Pilonidal Abscess: Long Term Results

## Sakrokoksigeal Akut Pilonidal Apse ile Başvuran Hastaların Tedavisinde Limberg Flep: Geç Dönem Sonuçları

Gökhan Demiral

Recep Tayyip Erdoğan University Training and Research Hospital, Department of General Surgery, Rize, Turkey

### ABSTRACT

**Aim:** In this study, we evaluated the long-term results of patients who presented with acute pilonidal abscess in the sacrococcygeal region and were treated with Limberg flap.

**Method:** Twenty-four male military personnel who were admitted to the outpatient clinic for the first time with the diagnosis of pilonidal abscess and who did not have regular wound care were prospectively followed. Patients with recurrence were not included in study. Limberg flap technique without drainage was applied to all patients. Age, surgery duration, length of hospital stay, and time to return to daily activities were recorded. The patients were asked about postoperative recurrence by telephone.

**Results:** Mean age was 25.2 years (20-32 years), mean length of hospital stay was 4.2 days (3-6 days), mean time to return to daily activities was 6.8 days, and mean duration of surgery was 45.2 minutes (37-68 minutes). Hematoma was observed postoperatively in 2 patients and seroma in 3 patients. The patients with hematomas were reoperated at 1 month and 3 months. One seroma patient and 4 of the other patients were also reoperated at different hospitals due to recurrence. In total, recurrence was observed in 7 patients (29.1%).

**Conclusion:** Although the recurrence rate in our study is higher than in elective cases, it is possible to apply the Limberg flap with a shorter hospital stay and earlier return to work in selected patients with pilonidal abscess who live and work in poor hygienic conditions.

**Keywords:** Sacrococcygeal pilonidal sinus, abscess, Limberg flap, recurrence

### ÖZ

**Amaç:** Bu çalışmada sakrokoksigeal bölgede akut pilonidal apse ile başvuran ve Limberg flep uyguladığımız hastaların geç dönem sonuçları değerlendirilmiştir.

**Yöntem:** Pilonidal apse tanısı ile ilk kez polikliniğe başvuran ve düzenli yara bakım imkanı olmayan 24 erkek askeri personel retrospektif olarak değerlendirildi. Daha önce ameliyat olmuş nüks olgular çalışmaya alınmadı. Tüm hastalara Limberg flep tekniği uygulandı. Diren kullanılmadı. Olguların yaş, ameliyat süreleri, hastanede kalış süreleri ve günlük aktivitelere dönüş süreleri kaydedildi. Ameliyat sonrası telefon ile ulaşılarak nüks durumları sorgulandı.

**Bulgular:** Yaş ortalaması 25,2 (20-32), hastanedeki kalış süresi 4,2 gün (3-6), günlük aktivitelerine dönüş zamanı 6,8 gün, ortalama ameliyat süresi 45,2 dakika (37-68) idi. Ameliyat sonrası dönemde 2 hastada hematoma, 3 hastada ise seroma gözlemlendi. Hematom gözlenen hastalar postoperatif 1. ve 3. ay nüks ile reopere edildi. Seroma gelişen olgulardan biri 35. ay ve diğer hastalardan dördü nüks nedeniyle değişik merkezlerde opere edildikleri öğrenildi. Toplam 7 hastada nüks gelişmiş idi (%29,1).

**Sonuç:** Her ne kadar çalışmamızda nüks oranı elektif olgulara kıyasla yüksek olsa da kötü hijyenik ortamlarda çalışma veya yaşama zorunluluğu olan seçilmiş pilonidal apseli olgularda hastanede kalış süresinin kısa olması ve erken işe dönüş süresi ile Limberg flep uygulanabilir.

**Anahtar Kelimeler:** Sakrokoksigeal pilonidal sinüs, apse, Limberg flep, nüks



Address for Correspondence/Yazışma Adresi: Gökhan Demiral MD

Recep Tayyip Erdoğan University Training and Research Hospital, Department of General Surgery, Rize, Turkey

Phone: +90 535 291 93 91 E-mail: drgokhandemiral@yahoo.com ORCID ID: orcid.org/0000-0003-2807-5437

Received/Geliş Tarihi: 14.10.2017 Accepted/Kabul Tarihi: 29.11.2017

This study was presented as an oral presentation at the 16<sup>th</sup> Turkish Society of Colon and Rectal Surgery Congress held on 16-20 May 2017.

## Introduction

Pilonidal sinus (PS) disease is a common condition among young adults. While many methods have been developed for its treatment, flap methods are frequently used today. However, recurrences remain a problem and the search is ongoing for an ideal treatment approach.<sup>1,2,3</sup> Nearly 50% of patients with sacrococcygeal PS present with abscesses.<sup>4,5</sup> In cases of infected PS, the treatment process is prolonged and the preparation stage for elective surgery becomes more difficult in individuals with poor hygiene. It is often not possible to ensure proper wound care in these individuals, and therefore, to achieve the tissue planes sufficiently clear of infection that are desired for elective surgery. In addition, without drainage it can create a septic focus and lead to extensive tissue damage; patients with recurrent abscesses may present with extension to the anal canal and perianal region.<sup>6,7</sup> In this study, we assessed the long-term results of patients who presented with acute pilonidal abscess in the sacrococcygeal region and were treated with the Limberg flap technique.

## Materials and Methods

In this study, 24 male military personnel who presented to the outpatient clinic for the first time with a diagnosis of acute pilonidal abscess in the sacrococcygeal region between November 2009 and June 2010 and who did not have the means for hygienic self-care and regular wound dressing were retrospectively followed. Patients with recurrence who had previously undergone surgery were not included in the study. Detailed informed consent was obtained from each participant in accordance with the Declaration of Helsinki criteria. Because of the study was retrospective, ethics committee approval was not obtained. Limberg flap technique guided by methylene blue staining was performed under spinal anesthesia with patients in the prone jack-knife position. Drains were not placed. Age, surgery duration, hospital stay, and time to return to work were noted for each patient. All patients were administered ampicillin + sulbactam 750 mg, twice daily for 5 days postoperatively. Patients were contacted by phone after surgery and asked if they had experienced recurrence.

## Results

The mean age of the patients was 25.2 years (20-32 years), the mean length of hospital stay was 4.2 days (3-6 days), and the average time to return to daily activities was 6.8 days. The mean surgery duration was 45.2 minutes (37-68 minutes). Two patients had postoperative hematoma. Drainage was done through the incision line. Three patients developed seromas. Of the patients with hematoma, recurrence was

observed at postoperative 1 month in one and postoperative 3 months in the other, and both underwent a second surgery. One of those patients experienced another recurrence 18 months postoperatively, and one of the patients with seroma had recurrence 35 months postoperatively. Another 4 patients also underwent repeat surgery at other centers due to recurrence. In total, 7 patients had recurrence (29.1%) (Table 1).

## Discussion

There are different approaches to the surgical treatment of PS. Flap methods, which have increased in popularity in recent years, aim to correct the intergluteal line and reduce scar tissue that may form on the midline.<sup>1,2</sup> The conventional treatment for acute pilonidal abscess is indisputably incision and drainage. However, development of chronic PS is common after this procedure (16-92.5%).<sup>1</sup> In cases of infected PS where proper antibiotherapy and wound dressing are not available, preparation for elective surgery following incision and drainage lasts for days and is sometimes not possible. Although studies have reported a 3% recurrence rate when the wound is left open after cystectomy, this approach is less desirable due to the fact that it requires wound dressing for up to 45 days, reduces the patient's quality of life, increases costs due to lost work time, and is psychologically distressing for the patient.<sup>1,8</sup> Several publications on the primary closure method report recurrence rates as high as 20%. A simple incision alone, without curettage of the sinus tracts and cavity, has been reported to result in recurrence at a rate of approximately 24% in cases of acute pilonidal abscess.<sup>8,9,10</sup>

Hanley<sup>11</sup> asserted that cyst excision with abscess drainage is effective. Courtney and Merlin<sup>12</sup> reported chronic PS development in 13% of patients after incision, curettage, and 2% local fusidic acid dressing. Simms et al.<sup>13</sup> compared acute abscess patients treated by incision and simple drainage with those treated by incision, curettage, and primary suturing, and found that 35% of the second group did not recover successfully. Lord and Millar<sup>14</sup> reported a 97% success rate

**Table 1.** Demographic data of the patients

Age (years)	25.2 (20-32)
Surgery duration (min)	45.2 (37-68)
Hospital stay (days)	4.2 (3-6)
Time to return to normal daily activities (days)	6.8
Complications	Hematoma (2), seroma (3) 20.8%
Recurrence	7 (29.1%)
Mean follow-up time (months)	60

with excision and mechanical cleaning in patients with acute abscess and chronic PS, while Edwards<sup>15</sup> reported a PS recurrence rate of 11% with mechanical cleaning and 57% without mechanical cleaning in the same groups.

A prospective study by Ciftci et al.<sup>1</sup> compared oblique excision with primary closure (n=45), a new approach in the treatment of acute pilonidal disease, with incision and simple drainage (n=52). No drains were placed. Return to work time in the two groups was reported as 22-27 days and 18-25 days ( $p<0.001$ ) and recurrence rates at the end of a 24-month (18-30 months) follow-up period were 6.6% (n=3) and 78.8% (n=41), respectively. The authors emphasized that this new method may be preferable for the treatment of acute abscesses due to its low recurrence rate.<sup>1</sup> A prospective study by Kanat et al.<sup>16</sup> compared early surgery using unroofing-curettage (n=28) with elective Karydakís flap surgery (n=25) in pilonidal abscess cases and reported recurrence in just one patient in each group ( $p<0.05$ ). Mean recovery times were 34.7 days (28-42 days) and 25.9 days (21-46 days), respectively ( $p<0.05$ ). The authors concluded that the elective Karydakís flap procedure is superior because it provides shorter recovery time and better patient comfort.<sup>16</sup> Garg et al.<sup>17</sup> applied the laying open (deroofing and curettage) procedure under local anesthesia in a total of 33 patients, 11 of whom had pilonidal abscess and 22 of whom had chronic pilonidal disease, and followed them for a mean of 24 months (6-46 months). They reported recurrence in only 2 patients (6.2%). The average time to return to daily activities was 4.3 ( $\pm 3.2$ ) days and the average recovery period was 42.9 ( $\pm 8.1$ ) days. Due to its low recurrence rate, the authors claimed that it should be the first-line treatment for pilonidal disease.<sup>17</sup> In another study that followed 150 patients for 65 months, the recurrence rate was 54% for simple drainage alone, versus 10% when curettage and laying open were added.<sup>10</sup> This can be attributed to the removal of debris, hair, and granulation tissue and elimination of possible sinus tracts in the curettage procedure. In our study, the mean time to return to daily activities was 6.8 days and the rate of recurrence was 29.1%. Although this rate is high compared to PS patients on whom the elective Limberg technique is performed, we found no data in the literature on performing the Limberg flap technique on acute infected PS patients at first admission.

There was also limited information regarding the efficacy of postoperative drainage in patients treated with a Limberg flap. The use of drains is not always necessary in patients treated with the Limberg flap technique. Some studies have shown that after proper hemostasis is achieved; not placing a drain had no effect on postoperative rates of hematoma, infection, minimal fluid formation, abscess, and recurrence.

Dadacı et al.<sup>18</sup> divided 31 patients treated with Limberg flap technique due to chronic PS into 2 groups, those with drains (n=13) and those without (n=18), and followed them for 2 years. There was no recurrence in either group. Two patients (16.7%) who had drains and 3 (15.4%) who did not have drains developed abscesses in the postoperative period ( $p>0.05$ ). Based on their findings, they concluded that a drain not necessary in the Limberg flap technique.<sup>18</sup> There are also studies which indicate that routine use of drains in patients treated with the Limberg flap will not have a significant contribution to wound-related complications, recurrence, or hospitalization time.<sup>3,19</sup> Šutalo et al.<sup>20</sup> divided 90 chronic PS patients who underwent excision and midline primary repair into 3 groups: no drain, drain, and passive drainage with a penrose drain, and followed them for a mean of 54 months. The rates of recurrence were 16.6%, 10%, and 13.3%, respectively. They stated that midline primary closure, especially without the use of a drain, is not suitable because it leads to more complications and recurrences.<sup>20</sup>

Recent studies on endoscopic pilonidal abscess treatment (EPAT) in patients with sacrococcygeal pilonidal abscesses are also noteworthy. Javed et al.<sup>21</sup> presented the short-term results of a study in which they compared incision and drainage (n=20) with EPAT (n=20) in patients with pilonidal abscess. After these procedures, complete recovery was achieved within 6 weeks in both groups and there was no need for readmission or additional surgical interventions. A total of 4 patients (20%) from both groups required PS surgery at an average of 10.5 months and 13 months. The authors stated that EPAT for acute pilonidal abscess provides short surgery times and rapid recovery with low morbidity and recurrence rates, but noted that studies including larger case series are needed.<sup>21</sup>

The main objectives in the search for effective methods in the treatment of pilonidal abscesses is to reduce postoperative morbidity, accelerate return to work, and prevent recurrences.<sup>16</sup> In the largest series to date in this area, Karydakís<sup>22</sup> followed 7471 patients for a period of 2 to 10 years between 1966 and 1990 and reported a recurrence rate of less than 1%. Compared to their work, all of the abovementioned studies included very few cases and had short follow-up periods. These major limitations indicate that studies with broader scope and longer follow-up times are needed in order to make more assertive and definitive claims.

Considering the failure of other methods, the Limberg flap technique is regarded as an effective alternative treatment for PS.<sup>23</sup> The high rate of recurrence (29.1%) observed in our study is quite striking when compared with recurrence rates reported in the literature following the Limberg flap

procedure (2.5-4%). Despite having a follow-up period, limitations of our study include the lack of a control group, the limited number of patients, and the predominance of males in our patient group. We also believe that of the 7 cases of recurrence, the postoperative development of hematoma in 2 patients and seroma in 1 patient may also have been a factor. We believe that conducting large-scale randomized controlled trials including additional criteria such as postoperative ultrasound monitoring of seromas and hematomas and measurement of excised material will elucidate the role of drainage in this high recurrence rate and help solve these problems.

It is necessary to identify an effective surgical method for rapid infection management and treatment in individuals living or working in poor hygienic conditions and with limited means of maintaining personal hygiene. Preparing such patients for elective surgery with incision and drainage followed by wound dressing is not always possible. Interventions involving either simple incision and drainage or unroofing and curettage require prolonged wound care and delayed return to labor; therefore, despite a higher recurrence rate than elective procedures, the Limberg flap technique allows shorter hospital stays and faster return to work, and is suitable for selected cases with pilonidal abscess.

### Ethics

**Ethics Committee Approval:** Because of the study was retrospective, ethics committee approval was not obtained.

**Informed Consent:** Consent form was filled out by all participants.

**Peer-review:** External and internal peer-reviewed.

**Financial Disclosure:** The author declared that this study received no financial support.

### References

1. Ciftci F, Abdurrahman I, Tosun M, Bas G. A new approach: oblique excision and primary closure in the management of acute pilonidal disease. *Int J Clin Exp Med* 2014;7:5706-5710.
2. Kapan M, Kapan S, Pekmezci S, Durgun V. Sacrococcygeal pilonidal sinus disease with Limberg flap repair. *Tech Coloproctol* 2002;6:27-32.
3. Erdem E, Sungurtekin U, Neşşar M. Are postoperative drains necessary with the Limberg flap for treatment of pilonidal sinus? *Dis Colon Rectum* 1998;41:1427-1431.
4. Bascom J. Pilonidal disease: long-term results of follicle removal. *Dis Colon Rectum* 1983;26:800-807.
5. Hussain ZI, Aghahoseini A, Alexander D. Converting emergency pilonidal abscess into an elective procedure. *Dis Colon Rectum* 2012;55:640-645.
6. Cubukçu A, Gönüllü NN, Paksoy M, Alponat A, Kuru M, Ozbay O. The role of obesity on the recurrence of pilonidal sinus disease in patients, who were treated by excision and Limberg flap transposition. *Int J Colorectal Dis* 2000;15:173-175.
7. Vallance S. Pilonidal fistulas mimicking fistulas-in-ano. *Br J Surg* 1982;69:161-162.
8. Matter I, Kunin J, Schein M, Eldar S. Total excision versus non-resectional methods in the treatment of acute and chronic pilonidal disease. *Br J Surg* 1995;82:752-753.
9. Allen-Mersh TG. Pilonidal sinus: finding the right track for treatment. *Br J Surg* 1990;77:123-132.
10. Vahedian J, Nabavizadeh F, Nakhaee N, Vahedian M, Sadeghpour A. Comparison between drainage and curettage in the treatment of acute pilonidal abscess. *Saudi Med J* 2005;26:553-555.
11. Hanley PH. Acute pilonidal abscess. *Surg Gynecol Obstet* 1980;150:9-11.
12. Courtney SP, Merlin MJ. The use of fusidic acid gel in pilonidal abscess treatment: cure, recurrence and failure rates. *Ann R Coll Surg Engl* 1986;68:170-171.
13. Simms MH, Curran F, Johnson RA, Oates J, Givel JC, Chabloz R, Alexander-Williams J. Treatment of acute abscesses in the casualty department. *Br Med J (Clin Res Ed)* 1982;284:1827-1829.
14. Lord PH, Millar DM. Pilonidal sinus: A simple treatment. *Br J Surg* 1965;52:298-300.
15. Edwards MH. Pilonidal sinus: a 5 year appraisal of the Millar-Lord treatment. *Br J Surg* 1977;64:867-868.
16. Kanat BH, Bozan MB, Yazar FM, Yur M, Erol F, Özkan Z, Emir S, Urfaloğlu A. Comparison of early surgery (unroofing-curettage) and elective surgery (Karydakias flap technique) in pilonidal sinus abscess cases. *Ulus Travma Acil Cerrahi Derg* 2014;20:366-370.
17. Garg P, Garg M, Gupta V, Mehta SK, Lakhtaria P. Laying open (deroofting) and curettage under local anesthesia for pilonidal disease: An outpatient procedure. *World J Gastrointest Surg* 2015;7:214-218.
18. Dadacı AH, Okuş A, Memişoğlu K, Yiğit E, Akalın NB, Peker M. The Effectivity of Drainage in Limberg Flap Procedure for Treatment of Pilonidal Sinus Disease. *Turk J Colorectal Dis* 2007;17:145-150.
19. Kirkil C, Büyük A, Bülbüller N, Aygen E, Karabulut K, Coşkun S. The effects of drainage on the rates of early wound complications and recurrences after Limberg flap reconstruction in patients with pilonidal disease. *Tech Coloproctol* 2011;15:425-429.
20. Šturalo N, Šoljić M, Kozomara D, Petričević J, Glibo DB, Bošnjak A, Culjak V. The influence of drainage in the treatment of chronic pilonidal sinus disease using midline closure. *Psychiatr Danub* 2015;27(Suppl 2):593-595.
21. Javed MA, Fowler H, Jain Y, Singh S, Scott M, Rajaganeshan R. Comparison of conventional incision and drainage for pilonidal abscess versus novel endoscopic pilonidal abscess treatment (EPAT). *Tech Coloproctol* 2016;20:871-873.
22. Karydakias GE. Easy and successful treatment of pilonidal sinus after explanation of its causative process. *Aust N Z J Surg* 1992;62:385-389.
23. Bozkurt MK, Tezel E. Management of pilonidal sinus with the Limberg flap. *Dis Colon Rectum* 1988;41:775-777.