Int Surg 2014;**99:**28–34
DOI: 10.9738/INTSURG-D-13-00150.1

Retrospective Review of Pilonidal Sinus Patients With Early Discharge After Limberg Flap Procedure

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The aim of this study was to evaluate the results of cases with pilonidal sinus (PS) disease that underwent Limberg flap (LF) transposition and to compare the short and long-term results of early discharge cases with those in the literature. A total of 345 patients who underwent rhomboid excision and LF transposition for PS were evaluated retrospectively. No major anesthetic or surgical complications occurred. Partial wound dehiscence, localized flap necrosis, hematoma, wound infection, and seroma rates were determined as 4.0, 2.1, 1.5, 3.3, and 3.7% respectively. All patients other than those with a hematoma or localized necrosis were discharged with a drain in place 24 hours after the operation. The recurrence rate was 3.9% after a mean 33.1-month follow-up (range, 6–72 months). As a result, we found that short and long-term results of patients who underwent LF and were discharged 24 hours after the operation were similar to those in the literature. We suggest that patients without postoperative complications, such as hematoma or flap necrosis, can be discharged early.

Key words: Pilonidal sinus – Hospitalization time – Limberg flap – Postoperative complications

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Pilonidal sinus (PS) is a common, chronic, benign disease of young adulthood that is encountered more commonly in males than in females. PS is not a major surgical challenge. However, considering the gender and age group it mainly affects, it is a serious condition that can cause significant loss of work and school in every community.[1]

The objectives for treating PS disease are minimal tissue loss, minimal postoperative morbidity, rapid return to daily activities and work, acceptable cosmetic results, minimal recurrence rate, and low cost. Although many surgical and nonsurgical techniques have been reported, no ideal treatment that provides all of these positive results is known.[2]

In this study, the short and long-term results of patients treated with the Limberg flap (LF) technique are reported, and the results of those discharged 24 hours postoperatively are discussed in light of data in the literature.

Materials and Methods

The medical records of 345 patients who underwent rhomboid excision and LF transposition for PS between January 2007 and January 2013 at the Sakarya University School of Medicine and Sakarya University Research and Educational Hospital, General Surgery Clinics were evaluated retrospectively. Twenty-one patients who had diabetes mellitus (n = 4); hematological or psychiatric disorders (n = 3); were using steroid therapy on a regular basis for several reasons (n = 1); had bilateral flaps (n = 2); or were undergoing no regular clinical follow-up (n = 11) were excluded from the study. The medical records of the remaining patients (n = 324) were evaluated in detail in terms of demographics, medical history of abscess drainage, type of disease (primary or recurrent), body mass index (BMI), type of anesthesia, postoperative complications, duration of hospitalization, time to return to work, hypoesthesia at the operative site, sense of tension and pain during daily activities, satisfaction with the cosmetic results, and recurrence rate.

Patients who were diagnosed with acute inflammation or abscess were operated on following the resolution of inflammatory signs with antibiotics, anti-inflammatory treatment, and abscess drainage. All cases were admitted to the hospital on the day of the operation. A single dose of prophylactic antibiotic (1-g intravenous cefazolin sodium) was administered immediately before the surgical incision. The operative site was clipped of hair and cleaned with povidone-iodine solution in the operating room. All but 7 patients were operated on in the prone position under spinal anesthesia. The planned excision site and the site that would be used for reconstruction were marked with a marking pen, the cyst was excised with a rhomboid incision, and an LF was prepared from the right gluteal region. Hemostasis was achieved by electrocautery after the excision, followed by placement of an aspirative drain in the incision. The flap was sutured to the presacral fascia with absorbable sutures (2/0 Vicryl), the subcutaneous tissue was approximated with 3/0 Vicryl sutures, and the skin was closed using 3/0 Prolene mattress sutures (Fig. 1).

Patients were placed in the supine position postoperatively. Patients in whom no hematoma or flap necrosis could be identified 24 hours postoperatively were discharged after uneventful mobilization.

The aspirative drain was removed after the volume of drainage was <20 mL during the outpatient follow-up visits, and sutures were removed after 10 to 12 days. Clinical follow-up visits were planned on days 3, 7, and 15 as well as the third month postoperatively in the outpatient clinic for early complications such as wound dehiscence, wound infection, or seroma. Long-term complications such as hypoesthesia, sense of tension and/or pain during daily activities, cosmetic results, and recurrence were evaluated at month 6 and then annually at the outpatient clinic and through phone calls. During the evaluation of cosmetic results, the only question posed to the patient was: "Are you satisfied with the cosmetic results?" to which the patient responded "yes" or "no."

Ethics committee approval was obtained from Sakarya University Faculty of Medicine (ref.no: 71522473.050.01).

Results

A total of 274 (84.5%) of the 324 patients were male and 50 (15.5%) were female, with a mean age of 28.1 years (range, 16–70 years) and a mean BMI of 23.7 kg/m^2 (range, 18.3–35.9 kg/m^2). Fifty-two patients (16.0%) were operated on for a recurrent PS, whereas 211 patients (65.1%) had a medical history of infection or abscess drainage at least once. General anesthesia was administered to 7 patients for various reasons, including obesity, previous spinal surgery, or patient preference (2.1%), whereas 317 patients (97.9%) were operated on under spinal anesthesia.

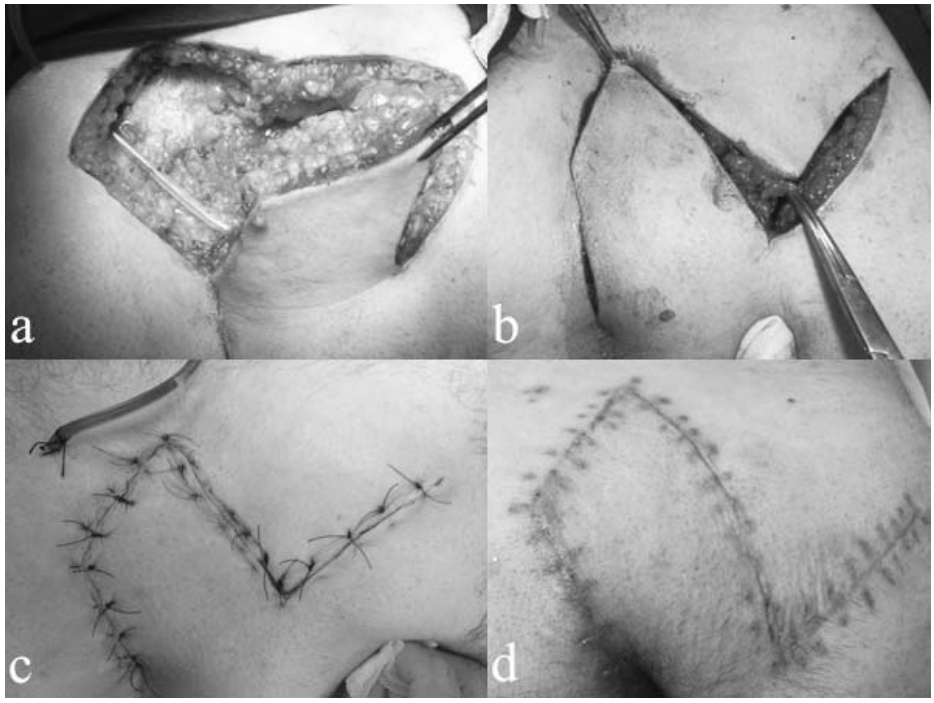

Fig. 1 Operative details and postoperative views; preparation of flaps (a, b), early (c) and late postoperative view (d).

Demographics, preoperative findings and type of anesthesia are shown in Table 1.

No major anesthetic or surgical complications, such as total wound dehiscence or total flap necrosis, occurred. Partial wound dehiscence was observed in 13 patients (4.0%), and localized flap necrosis with a total area of <2 cm^2 was identified in 7 (2.1%; Fig. 2). A postoperative hematoma was detected in 5 patients (1.5%), wound infection in 11 (3.3%), and development of a seroma was identified in 12 (3.7%). Localized wound dehiscence was treated with daily wound dressings, and all such patients recovered with secondary healing. In patients with a postoperative hematoma, the hematoma was drained in the operating room and hemostasis was restored. In patients with a wound infection, daily wound care was provided at the outpatient clinic with oral antibiotics according to the culture results. Anti-inflammatory drugs were prescribed and secondary suturing was performed. Development of a seroma was followed by physical examination and was treated with ultrasound-guided aspiration, when necessary, on an outpatient basis.

Table 1 Demographics, preoperative findings, and type of anesthesia

	Patients (n = 324)
Total, %	100
Male, n (%)	274 (84.5)
Female, n (%)	50 (15.5)
Age, y	Mean: 28.1 (16–70)
BMI	Mean: 23.7 (18.3–35.9)
Recurrent disease, n (%)	52 (16.0)
Previous infection or abscess, n (%)	211 (65.1)
Spinal anesthesia, n (%)	317 (97.9)
General anesthesia, n (%)	7 (2.1)

All patients (n = 312, 96.2%), other than those with a hematoma or localized necrosis (n = 12), were discharged with a drain in place 24 hours after the operation. Patients with a hematoma or necrosis were discharged on postoperative day 3. Following the exclusion of 36 patients who were not actively working, the mean duration to return to work was 18.7 days (range, 13–30 days).

The recurrence rate was 3.9% (n = 12) after a mean 33.1-month follow-up (range, 6–72 months) of 303 patients. After the patients with recurrence, <6 months after surgery and those who were reluctant to answer questions were excluded (n = 78), the rate of hypoesthesia at the surgical site that did not interfere with daily activities was 6.5% (n = 16); that of a sense of tension and/or pain during daily activities was 11.7% (n = 29); and the rate of patients who were not satisfied with the cosmetic results was 12.6% (n = 31) of 246 patients.

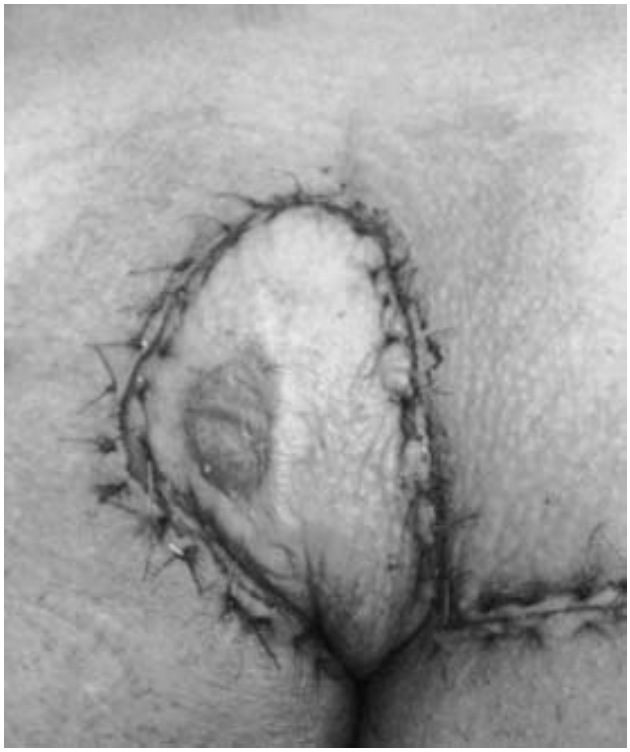

Fig. 2 Localized flap necrosis.

Early postoperative complications and long-term results are shown in Table 2.

Table 2 Early postoperative complications and long term results

Patients (n = 324)	
Total flap necrosis	0
Total wound dehiscence	0
Localized necrosis, n (%)	7 (2.1)
Partial wound dehiscence, n (%)	13 (4.0)
Hematoma, n (%)	5 (1.5)
Wound infection, n (%)	11 (3.3)
Seroma, n (%)	12 (3.7)
Patients (n = 288)	
Return to work (d), mean (range)	18.7 (13–30)
Patients (n = 303)	
Recurrence	12 (3.9%)
Patients (n = 246)	
Hypoesthesia, n (%)	16 (6.5)
Sense of tension/pain, n (%)	29 (11.7)
Dissatisfaction with cosmetics, n (%)	31 (12.6)

Discussion

Various surgical methods have been used to treat sacrococcygeal PS; each is associated with different postoperative complications, morbidity, and recurrence rates for each of the procedures. Excision of the infected tissue and sinus orifices is not considered a major technical problem; thus, the discussion generally concentrates on the method for reconstructing the defect after excision. Healing is cumbersome and expensive for both the patient and physician due to its long duration and the requirement for daily wound dressings using the open-packing technique.[3] Although the primary closure method results in rapid recovery and quick resumption of daily activities, high complication and recurrence rates have been reported.[4,5]

A tendency toward using flap reconstruction techniques to treat PS has been established, as they provide the desired results, such as flattening of the natal cleft, providing tissue healing without tension, short duration of healing and return to work, acceptable cosmetic results, and low recurrence rates.[6] Various techniques have been described that attempt to eliminate factors that cause negative primary closure results such as a midline incision scar and tissue tension resulting in lower recurrence rates.[7–11] One of the most commonly used techniques is LF reconstruction.

The rate of development of flap necrosis after LF is 0 to 3.3% of cases.[1,12–14] Unalp *et al*[15] reported progressive ischemia and necrosis in only 1 patient (1.5%) who was treated with secondary healing following debridement of the necrotic tissue in their series of 66 patients. In contrast, Topgül *et al*[13] reported a partial necrosis rate of 3% (6 patients) with the development of necrosis in the upper part (at the end of the upper flap) in their series of 200 patients. Total flap necrosis was not observed in our series. The rate of partial necrosis was 2.1%, but not all necrotic tissue was at the edges of the flaps.

The rate of development of seroma after LF is 0 to 14.5% of cases.[4,16–19] Mentes *et al*[12] reported a seroma rate of 2.2% without placing a drain and a mean duration of hospitalization of 4.51 ± 2.85 days in their series of 353 patients. Kirkil *et al*[19] reported the rates of seroma development in groups with and without drains to be 10.7 and 18.5%, respectively (total, 14.5%), in their series of 55 patients who were randomized for drain placement with a mean 3.2 days of hospitalization. They reported that all such patients were treated by repeated aspiration of seromas. Okuş *et al*[16] reported a mean duration of hospitalization of 1.85 days and that no seroma developed in any patient treated with LF in their prospective study of 49 patients in an LF group in which drains were placed in all patients. Therefore,

Table 3 Comparison of present study with the literature

Author	Case number	Seroma, %	Infection, %	Wound dehiscence, (%)	Necrosis, %	Hematoma, %	Hospitalization, d	Return to work, d	Hypoesthesia, %	Cosmesis, %	Recurrence, %
Erdem E (1998)[18]	40	7.5	–	–	–	–	3.5 ± 1.16	–	–	–	2.5
Bozkurt MK (1998)[26]	24	4	0	8	–	–	Mean: 4.1	Mean: 17.5	–	–	0
Cubukçu A (2000)[21]	114	2.1	2.1	1.1	–	3.2	Mean: 5.3	–	–	–	5
Kapan M (2002)[20]	85	–	1.2	–	–	2.3	5.3 ± 0.2	21	–	–	3.5
Urhan M (2002)[4]	102	2.9	0.9	1.9	–	–	Mean: 3.7	Mean: 7	24.5	19.6	4.9
Eryilmaz R (2003)[29]	63	–	5	–	0	2	Mean: 3	Mean: 15	19	63	3
Topgül K (2003)[13]	200	1.5	1.5	–	1.5	–	Mean: 3.1	Mean: 12.8	7	–	2.5
Daphan C (2004)[1]	147	2	0	4.1	0	–	Mean: 5.9	Mean: 18.8	–	–	4.8
Ertan T (2005)[2]	50	–	3	1	–	?	Mean: 3.4	Mean: 15.8	–	7.4 (VAS)	1
Akca T (2005)[23]	100	–	2	0	–	–	2	Mean: 9.5	–	–	0
Katsoulis IE (2006)[25]	25	–	4	4	–	4	Mean: 4	Mean: 16	–	–	4
Unalp HR (2007)[15]	66	4.5	7.6	3	1.5	–	Mean: 3.6	Mean: 15.2	–	–	1.5
Akin M (2008)[30]	411	2.91	3.64	–	–	–	Mean: 3.2	Mean: 12.4	4.13	–	2.9
Mentes O (2008)[12]	353	2.2	6.5	1.7	0	–	Mean: 4.5	Mean: 17.2	2.2	–	3.1
Ersoy E (2009)[17]	50	0	8	0	0	0	?	Mean: 14	?	?	?
Muzi MG (2010)[28]	130	–	3.08	8	–	–	4.92 ± 2.10	8.48 ± 1.69	–	–	0
Akin M (2010)[27]	211	–	6.16	–	–	–	2.74 ± 0.8	9.81 ± 3.34	9.04	–	4.73
Ates M (2011)[24]	134	2.2	5.9	10.4	–	2.2	3.8 ± 1.19	–	–	3.16 ± 1.4	6.9
Kirkil C (2011)[19]	55	14.5	–	7.2	–	1.8	Mean: 3.2	–	–	–	9
Aithal SK (2013)[14]	30	–	–	–	3.3	–	2	21	–	Nicely	0
Khan PS (2013)[31]	60	–	1.6	0	–	–	Mean: 2	Mean: 9	–	–	0
Okuş A (2012)[16]	49	0	2.1	–	–	–	Mean: 1.85	–	–	–	4.1
Tufale AD (2012)[22]	40	7.5	5	0	–	7.5	1.77 ± 1.30	10.8 ± 3.25	–	–	0
Present Study	324	3.7	3.3	4.0	2.1	1.5	24 h	Mean: 18.3	6.5	12.6	3.9

these studies suggest no relationship between development of a seroma and duration of hospitalization. In our study, with a discharge policy at 24 hours after surgery, the rate of seroma development was 3.3%, and all patients were treated by repeated aspiration of the seroma.

The rates of hematoma and wound dehiscence after LF are 0 to 4% and 0 to 10.4%, respectively.[17,20–25] Those rates were 1.5 and 4.0% in our study, respectively. Although hematomas have been treated with repeated aspiration in some studies,[19] we preferred to achieve hemostasis under operating room conditions. The patients in our study were treated with daily dressing changes and secondary healing, as reported frequently in the literature.

The rate of wound infection after the LF procedure varies from 0 to 8% of cases.[1,2,16,17,22,24,26–29] Different rates of infection in studies with similar numbers of patients and duration of hospitalization have been reported,[1,16,22,28] suggesting that there is no direct relationship between the duration of hospitalization and the development of infection. The rate of infection was 3.3% (11 patients) in our series of 324 patients.

The most commonly reported result in long-term studies is the recurrence rate. The reported rates of recurrence following LF vary between 0 and 9%.[1,4,12–16,18–22,24,26,27,30,31] Two other long-term results—hypoesthesia at the operative site and cosmetic satisfaction—have been reported in only a few studies. Akin *et al*[27] reported a hypoesthesia rate of 9.04%, whereas Mentes *et al*[12] reported a rate of 2.2%. The rates of recurrence and hypoesthesia in our study agree with those in the literature (3.9 and 6.5%, respectively).

Various cosmetic satisfaction results have been reported. Aithal *et al*[14] expressed the cosmetic results as "wound healed nicely with minimal scarring," whereas Hlmebakk *et al*[32] and Ertan *et al*[2] used a visual analogue scale to evaluate cosmetic results. We asked patients whether they were satisfied with the cosmetic results, and the rate of dissatisfaction was 12.6%.

Short and long-term postoperative results agreed with the literature data in patients treated with the LF procedure in our study (Table 3). A significant feature of our study was that 96.2% of the patients were discharged at 24 hours postoperatively. The duration of hospitalization varies from 1.7 to 5.9 days in studies in which LF was performed for PS (excluding studies with a modified LF).[1,2,4,12–16,18–31] Harwood *et al*[33] reported a mean hospital stay of 3.5 days in their meta-analysis, with a tendency toward early mobilization and shortened duration of hospitalization.

PS is a benign disorder; however, as it affects the working population and individuals receiving their education or those in military service (young males), the time spent in the hospital continues to result in significant economic issues.[34] Using the LF procedure and discharging patients early with no changes in operative technique—in which positive results have been demonstrated in many retrospective and prospective studies—will help to lower costs without affecting the expected short and long-term results and will not compromise the "ideal treatment" principle.

In conclusion, the short and long-term results of patients in our study who underwent LF and were discharged 24 hours after surgery agreed with previous reports. We suggest that patients without postoperative complications, such as hematoma or flap necrosis, can be discharged early.

Acknowledgments

This study has been presented as oral presentation at XIV. National Colon and Rectum Surgery Congress, 2013, Antalya, Turkey.

Conflict of interest: None

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