

# Rhomboidal Excision and Limberg Flap for Treatment of Pilonidal Sinus

## A Clinical Experience

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### ABSTRACT

**Background:** There are many modalities for the treatment of pilonidal sinus, each of them has its own advantages and disadvantages. Using a cutaneous flap in closing the defect of the excised sinus has lastly been used and claimed to be of low side effects and better long lasting results.

**Objectives:** To evaluate the results of using a rhomboidal excision and rotational (Limberg) flap in the treatment of pilonidal sinus.

**Methods:** A case-series study, performed at Baghdad teaching and private hospitals from the 1<sup>st</sup> of February 2016 to the 1<sup>st</sup> of January 2018. A total of 48 patients were enrolled in this study. All underwent rhomboidal excision and Limberg flap surgery. Outcome results were evaluated.

**Results:** Of the 48 patients studied, there were 31 (64.5%) males and 17(35.5%) females. The age ranged between 16 and 40 years. The recurrence rate was 2.1% and the postoperative complications were 8.4%. About 70% of the patients were satisfied about the results of the operation.

**Conclusion:** The rhomboidal excision and rotational flap surgery for treatment of pilonidal sinus is a good choice and has low rate of recurrence and good patient satisfaction.

**Keywords:** Pilonidal sinus treatment, Rhomboidal excision, Limberg flap, Recurrence rate.

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The pilonidal sinus (PNS) describes a condition found in the natal cleft overlying the coccyx, consisting of one or many, usually non-infected, midline opening, which communicates with a fibrous track lined by granulation tissue and containing hair within the lumen<sup>(1)</sup>.

The estimated incidence of PNS in the United States is 26 per 100000 people<sup>(2)</sup>. Men are affected more than women. It is rare in both sexes before puberty and after the age of 40 years<sup>(3)</sup>.

The etiology of PNS is a matter of controversy between congenital and acquired theory. Now, the widely shifted towards acquired theory<sup>(4)</sup>. A widely acceptable view is that PNS is caused by local trauma, poor hygiene, excessive hairiness, and the presence of deep natal cleft<sup>(5)</sup>.

The management of PNS varies from conservative management, lying open all the tacks with or without marsupialization, excision of all tracks with or without primary closure and the excision of all tracks and then closure by designed to avoid a midline wound (Z-plasty, Karydakis procedure), and advancement or rotational (Limberg) flap which was first described 1946 and it consists of closing a 60° rhomboid-shaped defect with transposition flaps<sup>(1)</sup>. The main concern of the treatment to the patient is recurrence; literature review suggested, recurrence rate is ranged between 20 and 40%, regardless the technique used<sup>(6)</sup>.

The aim of this study is to evaluate the outcome of PNS treatment by rhomboidal excision and Limberg flap.

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## Methods

A case-series study conducted at Baghdad teaching hospital and private hospitals from the 1<sup>st</sup> of February 2016 until the 1<sup>st</sup> of January 2018.

The study conducted on 48 patients who were all adults with chronic PNS. All patients had no co-morbid disease.

The patients were admitted to the hospital one day prior to surgery and preoperative preparation was done for them.

At the time of admission, the following data were obtained: age, gender, past medical and surgical history. It was checked that all patient had no active infection or any discharge for the PNS, i.e. patients with acute inflamed PNS were excluded.

The operations were done under spinal, epidural or general anesthesia. Jackknife position was used in the surgery. The PNS was excised en-block with a rhomboid excision. The excision was carried down to the posterior sacral fascia. Then, a Limberg flap was prepared from the right or left gluteal region. The flap was rotated to cover the raw surface of the excised area, after approximation of the subcutaneous tissue with a synthetic absorbable suture and insertion of a corrugated drain. Then, the flap was sutured with interrupted mattress nylon suture. All patients received postoperative antibiotics for three days.

All patients were followed up in out-patient clinic for a period from 4 to 12 months.

A satisfaction scale was used to measure how much the patients were happy with this operation. It included three

degrees: Satisfied (little postoperative discomfort, early recovery, no complication); Acceptable (moderate discomfort, delayed recovery, no complication); Dissatisfied (infection, recurrence).

## Results

This study included 48 patients who were subjected to rhomboid excision with Limberg flap for PNS. Among these patients, 31 (64.5%) were males and 17 (35.5%) were females. The mean age was 22.5 ( $\pm 6.85$ ) (range 16-40) years, (Table 1).

On the early post-operative days, there were no complications in the majority of patients (44, 91.6%). Two patients, both were females of 35 and 40 years old, respectively, developed seroma with partial dehiscence of the wound. They were treated by wound care and secondary intention healing. Other two patients had wound infection, one was a 29-year old female and the other was a 17-year old male, they were managed by draining of the purulent discharge and appropriate antibiotics, (Table 2).

There was only one recurrence recorded (2.1%) after six months from the surgery, he was a male with an eighteen years old. He was treated by reoperation with Limberg flap from the other side with complete resolution, (Table 2).

The mean length of hospital stay was 1.2 ( $\pm 0.24$ ) day and ranged between one to two days.

Most of the patients (70.8%) were satisfied with the results of the surgery, whereas about 12.5% were dissatisfied about the results.

**Table 1: Sex and age of the patients.**

Age (year)	Male No. (%)	Female No. (%)	Total No. (%)
11-20	9 (18.8)	6 (12.5)	15 (31.3)
21-30	14 (29.2)	8 (16.6)	22 (45.8)
31-40	8 (16.6)	3 (6.3)	11 (22.9)
Total	31 (64.6)	17 (35.4)	48 (100)

**Table 2: Outcome of the Limberg operation.**

Outcome	Number of patients	Percent
Seroma	2	4.2
Wound infection	2	4.2
Recurrence	1	2.1
No complication	43	89.5
Total	48	100

**Table 3: Patients' satisfaction after the operation.**

Degree of satisfaction	Number of patients	Percent
Satisfied	34	70.8
Acceptable	8	16.7
Dissatisfied	6	12.5
Total	48	100

## Discussion

Lack of a final consensus concerning management of PNS leads to a question; which therapeutic method should we propose to the patient? The optimal method should include the following criteria: less complications, short hospitalization, fast recovery, low chance of recurrence<sup>(7)</sup>.

It is now known that primary wide excision without wound closure is associated with a relatively high recurrence rate and long wound healing time. Additionally, a large open wound in the vicinity of the sacrum is hard to accepted by young people, as well as the remaining scar<sup>(8,9)</sup>. Also, it needs regular wound care and discomfort of packing until the wound healed. In one study, the mean number of days off work following incision and drainage was 20 days<sup>(10)</sup>.

Excision with primary closure is more cosmetically acceptable but need bed rest and follow up for one week in the hospital<sup>(11)</sup>, with higher risk of postoperative infection with a recurrence rate of 18%<sup>(12)</sup>.

Bascom method through a lateral incision developed postoperative abscess in 6% of patients with 10% recurrence rate<sup>(13)</sup>.

According to Karydakís, tissue tension and shape of the gluteal fissure play an important role in the development of PNS<sup>(14)</sup>. The use of moving flap significantly influenced the reduction in the number of

recurrences, which ranged between 0-3%<sup>(15)</sup>.

In the current study, the procedure used was rhomboidal excision of the sinus track and covering it with Limberg flap. The percent of complications was 8.4% this included seroma formation and wound infection. A retrospective study from Turkey reported 15.6% complication rate in patients underwent Limberg flap and 87.5% complication rate in those underwent primary repair<sup>(16)</sup>. Tokac M et al, in their study reported no difference between Limberg and Karydakís flaps regarding complication rate<sup>(17)</sup>. Horwood et al demonstrated that the number of wound infection after primary closure amounted to 14% while that after flap closure 4-5%<sup>(18)</sup>.

Although the limitation of this study is the relatively low number of patients and short period of follow up period (ranged from 4 to 12 months) the reported recurrence rate in the present study is 2.1%. To compare this result with the randomized controlled study conducted in Alexandria of Egypt, it found a 3% recurrence rate in patients treated with modified Limberg flap<sup>(19)</sup>, while the study of Yildiz T et al, reported no recurrence rate in Limberg flap<sup>(16)</sup>. This was the same result reported by Bali I et al<sup>(20)</sup>.

Can et al compared the use of Limberg's and Karydakís's flaps, they found a high level of satisfaction 64 and 69.8%, respectively<sup>(21)</sup>. Karaca et al presented similar results with 78% of satisfaction rate<sup>(22)</sup>. In the present study, the satisfaction

rate was 70.8%. In a study conducted in Germany by Dahmann S et al, they found no difference in patient satisfaction, pain score and frequency of recurrence between secondary wound healing and Limberg flap treatment for PNS<sup>(23)</sup>.

Ersoy et al suggested that it is safe to discharge the patient from the hospital 48 hours after surgery<sup>(24)</sup>. In the present study, the mean stay period in hospital after the surgery was 1.2 days.

From the above discussion, it seems clearly that the ideal method for treating PNS is yet to be discovered. This was the same conclusion of Lebo PB et al from Germany who at the end of their comparative study between secondary wound closure and Limberg flap stated "With that said, patients should nonetheless be offered both techniques as the current literature does not reveal a clear benefit for either procedure"<sup>(25)</sup>.

Although the Limberg flap has better outcome regarding complication and recurrence, but it needs more evaluation on the long run regarding other parameters like cosmetic appearance, functional result, cost and sensory loss.

In conclusion; the results of the present study are comparable to those reported in other studies. The results are fairly good regarding complications and recurrence rate with accepted satisfaction rate.

Still a controlled comparative national study with long period of follow up is needed to support the result of this study, and to measure the other parameters concerned with this procedure.

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