

## The Use of Limberg Flap in the Management of Sacrococcygeal Pilonidal Sinus

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### ABSTRACT:

#### BACKGROUND:

Sacrococcygeal pilonidal sinus disease is a common condition that commonly seen in young adult males. It is disease that have high rates of morbidity unless properly identified and treated.

#### OBJECTIVE:

To study the procedure of Limberg flap reconstruction and to evaluate the results and success of Limberg flap reconstruction in pilonidal sinus disease management.

#### PATIENTS AND METHODS:

40 patients with pilonidal sinus disease selected randomly, rhomboid excision with Limberg flap was done for them. Duration of operation, postoperative pain, duration of hospital stays and postoperative complications were noted. Follow up of all patients was performed on an out-patient basis.

#### RESULTS:

Our study consists of 40 patients, 35males (87.5%) and 5 females (12.5%), with a mean age of 27.2 years range (18-36 years). The mean duration of symptoms was 2.25 months (range 1–3 months). Mean operative time was about 42.2 minutes (range 40-45 minutes), time to return to work and normal activities from 3 to 4 weeks. Postoperative complications occur in 4 patients in the form of wound infection and seroma.

#### CONCLUSION:

Limberg rhomboid flap in sacrococcygeal pilonidal sinus is useful in primary pilonidal sinus and in recurrent cases, has been associated with lower complication rates, healing time, and recurrence rates, and it is an easily mastered technique.

**KEYWORDS:** Pilonidal sinus, limberg flap, rhomboid excision, Natal Cleft

### INTRODUCTION:

Pilonidal Disease is a common problem and affecting men twice as often as women, it was originally thought to be congenital due to abnormal skin in the gluteal cleft, but recent theories consider it acquired (resulting from invagination of broken hair into the skin, and subsequently inciting an inflammatory reaction) rather than congenital.<sup>1,2,4</sup>

It is most frequently seen in the sacrococcygeal region, however, it has also been described in the axilla, suprapubic area, periumbilical area and between the fingers of the hand in the barbers. It includes Pilonidal sinus, Pilonidal cyst and Pilonidal abscess. Patient commonly presents with pain,

natal cleft abscess or discharging sinus after spontaneous rupture of the abscess<sup>15</sup>. It causes discomfort that may interfere with education or employment sometimes for prolonged periods.

It was termed 'jeep driver's bottom disease' during World War II because many drivers were found to have the condition<sup>14,12</sup>.

Management of the disease is challenging due to high rates of wound infection, impaired healing and recurrence. Thus, though not life threatening, it can cause significant morbidity, considerable time lost from work-which can amount to months and high rates of recurrence.

In spite of a large number of ingenious non-operative and operative methods of treatment, so far no single method can be relied upon to completely cure the condition and prevent recurrence.<sup>3,5,6</sup>

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## LIMBERG FLAP PILONIDAL SINUS

The management involves surgical or nonsurgical treatment modalities.

Non-Surgical treatment includes; **injection of sclerosing agent, fibrin Glue, cryo-surgery, electro-cauterization, repeated shaving or use of depilation creams.**

Surgical techniques include; **laying the track open, wide excision with open wound, wide excision with marsupialization, excision with primary midline or asymmetric closure and techniques involving various flap procedures.**<sup>9</sup> Flap techniques have revolutionized the management of pilonidal disease. Good technique, less incidence of recurrence, less morbidity, less duration of hospital stay and good patient compatibility have made these procedures popular and acceptable with minimal cosmetic disfigurement.<sup>8,9</sup>

Though many techniques are practiced, the LIMBERG'S RHOMBOID FLAP is a safe and reliable technique in the treatment of sacrococcygeal pilonidal sinus disease, with low complication and recurrence rates if performed according to appropriate surgical principles<sup>7,10</sup>. And this study aims at studying the procedure of Limberg flap reconstruction and evaluate the results and success of Limberg flap reconstruction in the pilonidal sinus disease management.

### PATIENTS AND METHODS:

**I- Data source:** The data were collected from the patients who presented with swelling with/without discharge and with/without pain in the gluteal region in Al-Hilla teaching Hospitals.

**II- Study type:** prospective study (2017-2018).

**III- Sample size:** Sample size of 40 patients comprise the inclusion criteria.

**IV- Collection of data:** Every patient was informed about the aim of our study with ethical aspects and a written consent was taken. During the study, duration of the symptoms, history of previous operations or abscess formation and investigations were recorded.

#### V- Inclusion Criteria:

1.It includes males and females; there age range (18-36 years).

#### VI- Exclusion Criteria:

- 1.Doesn't include pregnant women.
- 2.Pilonidal abscess.

#### VII-Procedure:

Surgery was performed under general anesthesia. Patients are placed in prone position with buttocks taped apart to open the natal cleft for more exposure then shaving of the area was performed. Marking the borders of resection and the flap with surgical marker (Figure-1) and skin preparation was performed.



(Figure -1) marking of the incision of limberg flap

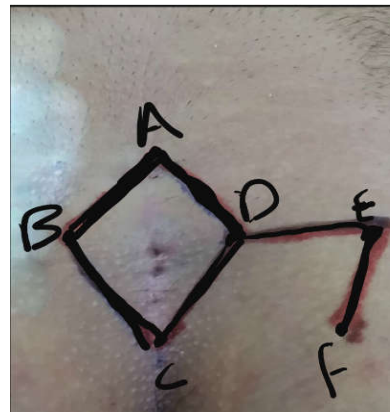
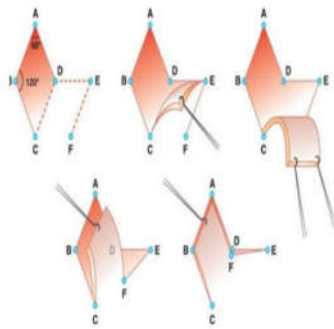
## LIMBERG FLAP PILONIDAL SINUS

Excising of all existing sinuses down to the presacral fascia using a rhombic incision. Rhombic area of skin and subcutaneous fat was excised and includes both midline clefts and any lateral extension of sinuses.

The long axis of the rhomboid marked in the midline and its shape is determined by the angles of  $60^\circ$  at **A** and **C** and  $120^\circ$  at **B** and **D**. First, the line **A-C** was labeled and its length is measured. **C** should be placed adjacent to the perianal skin, and **A** placed so that all diseased

area was included in the excision. The line **B-D** transected the midpoint of **A-C** at right-angles and was 60 per cent of its length.

The flap was planned so that **D-E** makes a direct continuation of the line **B-D** and its length is equal to the incision **B-A** to which it was sutured after rotation. **E-F** was parallel to **D-C**, and of equal length. After rotation, it was sutured to **A-D**. (Figure-2 a<sup>23</sup>, b)



(Figure 2 a, b) Limberg flap (planning and marking of the Incision)

The flap is constructed by extending the incision laterally down to the fascia of the gluteus maximus muscle. Hemostasis was done by the use of electrocautery. After excision of the sinuses the flap mobilized to the rhomboid defect (Figure-3).

Closed suction drain was putted though a separate stab wound and the wound closed in two layers, firstly we close the subcutaneous layer by interrupted 2/0 absorbable suture (vicryl) then we close the skin by interrupted 2/0 non-absorbable suture (nylon). (Figure-4,5)



(Figure-3)



(Figure-4)



(Figure-5)

Patient advised to sleep on prone or left lateral or right lateral position in postoperative ward, and kept on:

- 1-Amikacin vial 500mg \*2
- 2-Flagyl vial 500mg \* 3
- 3-Paracetamol vial 1g \* 3
- 4-Tramadol amp. O/N

Patients discharged home after 24-48 hrs postoperative and the drain removed from 9-11 days postoperative. Sutures are removed from 12-14 days postoperative. The Patients was advised to avoid sitting for prolonged time or exercise for about two weeks.

Hair removal done by hair clippers or by hair removal creams used regularly each month for at least 5-6 months is advised. Patients was followed up in the outpatient clinics monthly for about 3-6 months.

Duration of hospital stay, postoperative complications, time to return to normal activities and work, and recurrence of PNS all were recorded. Postoperative degree of pain using pain scoring scale also was recorded.

**RESULTS:**

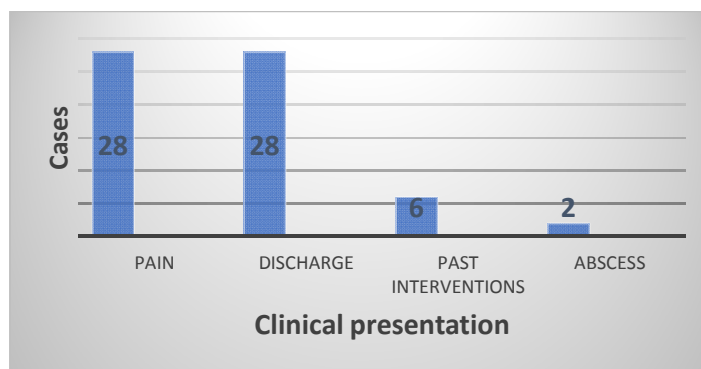
This study consists of 40 patients; 35 males (87.5%) and 5 females (12.5%), with a mean age of 27.2 years range (18-36 years). The mean duration of symptoms was 2.25 months (range 1–3 months). Mean operative time was about 42.2 minutes (range 40-45 minutes). All patients discharged home 24 h to 48 after the operation, with 3 cases of wound infection (treated conservatively), one case of wound seroma (managed conservatively by local drainage after giving local anesthesia in outpatient clinic), no case of fat necrosis was recorded.

Time of walking without pain and no requirement for oral analgesic from 12 to 16 days and the time needed to return to the work and patient's normal activities from 3 to 4 weeks.

The distribution of patients was plotted according to the demographic characteristics, history of the disease, time of the operation, score of pain and postoperative outcome was described in (Table-1) (Table-2), (Table-3), (Graph-1), (Graph-2).

**Table (1) Demographic characteristics**

Age group	Males	Females
18-22.5	7	1
22.5-27	16	3
27-31.5	9	1
31.5-36	3	0
	35	5



**Graph-1: Clinical presentation**

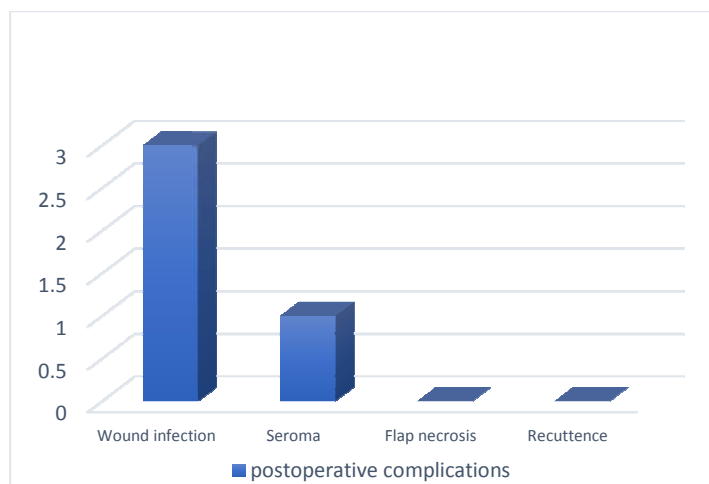
**Table-2: Presentation**

Clinical presentation	Number of patients (%)
Pain	28(80%)
Discharge	28(80%)
Past interventions	6(15%)
Abscess	2(5.1%)

Table-3: Operative Data

	Range
Operative time	40-45 min
Pain score (VAS)	2-4
Hospital Stay	1-2 days
Drain removal	Variable*
Suture removal	12-14 days

\*Removed after discharge dropped to less than 30 ml per day.



Graph-2: postoperative complications

### DISCUSSION:

The surgical treatment should intend towards removing all the sinus tracts as well as the predisposing factors that contribute in the formation of pilonidal sinus. The goals of the ideal procedure for the treatment should be reliable wound healing, a low risk of recurrence, a short period of hospitalization, minimal inconvenience to the patient, and low morbidity with few wound-management problems. Also, treatment should allow the patient to resume normal daily activities as quickly as possible.

Many surgical operations are used for the treatment of pilonidal sinus (sacrococcygeal) that varies from excising pilonidal sinus and leaving the wound open to heal with secondary intention or by primary closure of the wound with or without flap reconstruction.<sup>21,22,23</sup> Closure of the wound gives cosmetically acceptable results for some patients and it is associated with a shorter time for healing and

returns to work earlier if compared with open procedure but the scar resulting from it remains in the midline and the incidence of recurrence is higher.<sup>16,17,19,20</sup>

In this study, 40 patients with sacrococcygeal PNS were managed with Limberg flap reconstruction. Reconstruction by the use of Limberg flap has several advantages including; easy to perform and design, flattens natal cleft with enough vascularized pedicle, tension free suturing.

This successively reducing the friction, maintains good hygiene, preventing maceration, and avoiding midline scar formation.

Resume of work and normal activities in our study was 3 to 4 weeks, hospital stay 24 to 48, only a case of seroma and two cases of wound infection were recorded and all managed conservatively in about 2 weeks on daily wound dressing.

Different series have reported wound infection rates of **1.5-10%**<sup>14</sup>, in our study only **7.5%**, regarding pain scoring when we compare our study in which the score **2-4**(mean =**3**) while in some other studies using variable treatment modalities ranging from zero in simple excision, **6.7** in excision and marsupialization, **7.3** in excision and midline closure, **4.5** in excision and flap techniques. Recurrence rate in our study not recorded while in other studies it occurs in **10%** of cases in whom various treatment modalities applied from wide excision, marsupialization to flap techniques<sup>25</sup>.

#### CONCLUSION:

we are concluded that Limberg rhomboid flap reconstruction after excision of sacrococcygeal pilonidal sinus is meticulous, safe, easy to be done, low operative time, low post-operative pain, low hospital stays, early return of the patient to work with low local recurrent when we compare it with other studies<sup>24,25</sup>, and suitable to primary and recurrent cases and meet acceptance from the patient preoperative during discussion with the patient for writing the surgical consent and postoperative due to the previous benefits.

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