

## Evaluation of the Outcomes of Rhomboidal Flap "Limberg Flap" Repair Procedure for Sacrococcygeal Pilonidal Sinus Disease in Baghdad Teaching Hospital

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### ABSTRACT:

#### BACKGROUND:

Sacrococcygeal Pilonidal sinus is a common surgical condition and its management is still debatable, as many surgical techniques were developed aiming to improve outcome, better patient satisfaction, and most importantly to prevent recurrence. Rhomboidal flap procedure "limberg flap" is very safe and effective method for pilonidal sinus treatment due to its low complication rate specially recurrence hence in this study we address the role of limberg flap procedure in management of pilonidal sinus and how its complications are.

#### OBJECTIVE:

To analyze the outcome of "Limberg" Rhomboidal flap, in managing sacrococcygeal Pilonidal sinus as a novel, with a potentially less complication and recurrence rate surgical procedure.

#### PATIENT AND METHOD:

This is a prospective study on 44 patients suffered from sacrococcygeal pilonidal sinus, 36 patients with primary disease and 8 patients had recurrent or previously managed pilonidal sinus collected randomly in the 5th floor surgical department in Baghdad teaching hospital from June 1st 2014 to December 10th 2015. All underwent rhomboidal flap procedure .there was no exclusion criteria, data collected included demographic distribution, primary or recurrent pilonidal sinus, wound complications, and recurrence. The minimum follow up period was 1 year after surgery.

#### RESULTS:

44 patients had undergone this procedure most of them were males (41 patients), and (3 patients) were females, youngest patient was a 16-year old and oldest one was 41-year old. Mean age was 26. 1years±5.6SD, 5 patients (11.4%) had a previous formal surgical repair of pilonidal sinus, 3 patients (6.8%) had a previous drainage of pilonidal abscess. The mean duration of the disease is 10.9 months±6.9 SD. Our finding revealed that 3(6.8%) patients developed seroma , 2(4.5%) patients had wound infection that all responded to conservative treatment. Other suspected complications including flap necrosis, wound dehiscence and hematoma were not reported with any of our patients.

#### CONCLUSION:

Rhomboid flap is very safe and effective method for treatment of pilonidal sinus disease due to its low complication rates especially recurrence of pilonidal disease, it also offers a good patient satisfaction, although this procedure takes a longer operating time than the classical methods but it is easy to be learned and practiced with efficiency .

**KEYWORDS:** sacrococcygeal pilonidal sinus, rhomboidal flap, limberg flap, recurrence

### INTRODUCTION:

The term "Pilonidal Sinus" describes a spectrum of diseases ranging from asymptomatic hair containing cyst or cysts to large symptomatic abscesses, usually occurring in the sacrococcygeal region and occasionally in other sites and have a tendency to re occur <sup>(1)</sup>.

The origin of the word Pilonidal sinus is derived from latin "*pilus*" meaning hair and "*nidus*" meaning nest , so it literally means "*hair nest*"<sup>(1)</sup>

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The incidence of Pilonidal sinus is 26 in 100,000 individual with a male to female ratio of 3-4:1 , the age of presentation is usually between 18 to 25 years of age , rarely before puberty or after 42 years of age<sup>(1)</sup> . Risk factors include: sedentary lifestyle or occupation, positive family history, obesity, local irritation or trauma <sup>(3)</sup>. Management of Pilonidal disease depends on the nature, presentation, and the attitude and wishes of the individual concerned<sup>(4)</sup>, the main concern for treatment is recurrence, overall recurrence

rate of pilonidal sinus was more common with midline closure (11.7%) than open healing (4.5%) which showed a 58% lower rates of recurrence at one year postoperatively<sup>[5]</sup>.

It can be divided into:

**Conservative:** for asymptomatic patient whose elective surgery risk and discomfort outweighs the potential benefit of avoidance of future abscesses, also for symptomatic patients who present early with no evidence of cellulitis<sup>(4)</sup>.

**Operative:** An acute pilonidal abscess is treated by incision and drainage procedure under local or general anesthesia with curettage of the abscess cavity, this carries a recurrence rate of (20-55%)<sup>(2)</sup>. A variety of procedures were described to treat chronic pilonidal abscess which reflects the long sought trials for decreasing recurrence rates like: excision and laying open of the sinus tract<sup>(2)</sup>, excision with primary closure<sup>(6,7)</sup>, wide and deep excision to the sacrum<sup>(6)</sup>, incision and marsupialization<sup>(8)</sup>, Bascom procedure<sup>(9)</sup>, excision and flap reconstruction (V-Y plasty, Elliptical flap, Rhomboidal flap, Karydaki flap).<sup>(10,11)</sup>

Rhomboidal flap, also called rhomboidoplasty, or Limberg flap was designed by Limberg in 1946<sup>[11]</sup>, briefly described as an excision of a rhombic area of skin and subcutaneous tissue including all the midline pits and lateral sinuses, then a lateral rhomboidal flap is rotated to cover the midline defect<sup>[12,13,14]</sup>.

Its advantages are that it is easy to perform, with sutures away from the midline, giving rise to tensionless flap of unscarred skin in the midline which facilitates good maintenance and hygiene, decrease the force on the wound, reduces maceration, sweating and scar formation, thereby reducing recurrence<sup>(11)</sup>.

### **AIM OF STUDY:**

To analyze the outcome of "Limberg" Rhomboidal flap, in managing sacrococcygeal Pilonidal sinus as a novel, with a potentially less complication and recurrence rate surgical procedure.

### **METHOD:**

This is a prospective study involving 44 patients suffering from pilonidal sinus disease collected randomly from the 5<sup>th</sup> floor in Baghdad Teaching Hospital, from June 1<sup>st</sup> 2014 to December, 10th 2015, informed consent was taken from all patients to participate in this study, most of the patients were males (41 patients) and 3 were female patients, youngest patient was 16 years of age and oldest was 41 years of age.

### **Technique**

All patients were asked to shave the skin of both buttocks and lower back one hour prior to surgery, by a razor or electric clipper.

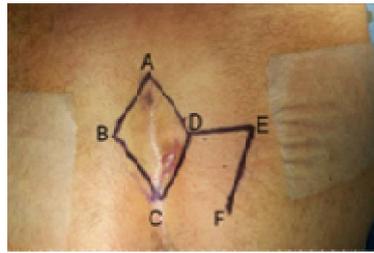
Anesthesia (spinal or general) was given on a separate couch on a supine (general) or sitting (spinal) positions then turned over to the operating table after intubation putting them on prone position. two sand bags were applied, one under the waist and another one under the chest in order to make a space for the patient abdomen to move freely during respiration under the general anesthesia

Patient's buttocks were strapped apart by plastering them to the sides of the table.

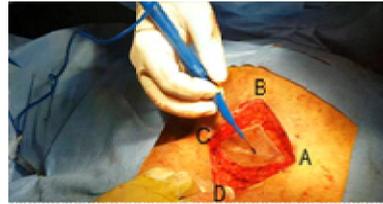
The skin is prepared in the usual manner.

Probing the openings of the pits done to assess how much the sinus extends laterally.

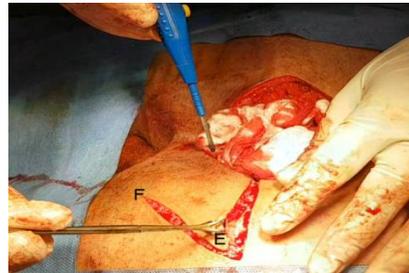
A rhombic skin area is marked around the pilonidal sinus, with the long axis of the rhomboid is on the midline, the rhombic segment should include all the midline pits and lateral extensions of the sinus/sinuses, if present. And its lowest point (C in the figure) should be equal to or more than 2 centimeters from the anal margin. Details of marking are shown in figure.1.



**Fig.1: Marking with let**



**Fig 2: excision of a rhombic shape down to the deep sacral fascia**



**Fig 3 :Making of a rhombic flap.**



**Fig 4: Rhomboid flap rotation.**



**Fig 5: Final outcome after suturing.**

Post-operatively the patient is instructed not to sleep on his/her back for a week or so as not to compromise blood supply to the flap, hospital stay ranged from 1 to 4 days, antibiotics and

analgesia are given for 7 days and the drain and the stitches are removed 14 days later.

The patient is followed up in person first at day10 post operatively, one month, and one year

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later, with regular one monthly phone calls, three main questionnaire papers were prepared for each patient to fill in each post op. visit to assess the presence or absence of potential complications.

### RESULTS:

The results of current study showed that the mean age of studied group was 26.1 years±5.6 SD, mean duration of disease was 10.9 months ± 6.9 SD. The distribution of studied sample according to sociodemographic characteristics revealed that 65.9% was in age group of 21-30 years, 93.2% of the patients were males, and 59.1% of the patients were overweight with BMI ranged from 25-29.9.

Eight patients (18.2%) had recurrent pilonidal sinus following a previous surgical intervention, five of them (11.4% of total) had drainage only, and the remaining three (6.8% of total) had a failed elective surgery, 13 patients were given spinal anesthesia, and 31 patients were given general anesthesia.

The current study shows that three patients (6.8%) developed Seroma, and 2 patients (4.5%) developed wound infection, these patients were treated conservatively and the complications were absent in the one month follow up visit. Hypertrophic scar was noted in one patient during the one month and one year of follow up visits. No hematoma, wound dehiscence, Ischemia or flap necrosis was encountered.

**Table 1: Association of frequency of each complication and time sequence of follow up.**

complications	Time sequence of follow-up					
	After 10 days		After 1 month		After 1 year	
	No.	%	No.	%	No.	%
Seroma	3	6.8%	0	0.0%	0	0.0%
Wound infection	2	4.5%	0	0.0%	0	0.0%
Keloid or hypertrophic scar	0	0.0%	1	2.3%	1	2.3%
Recurrence	0	0.0%	0	0.0%	0	0.0%

### DISCUSSION:

The major concern of pilonidal sinus surgery to the patient and the doctor is recurrence, so there is a quest to find the best method which has the least recurrence rate, and due to that search a range of procedures were developed, flap techniques have been associated with lower infection and recurrence rates, shorter hospital stay, and better aesthetic results. With this technique the internal cleft can be flattened, and tissues can be approximated without tension<sup>[15]</sup>. The importance of post-operative wound care should also be stressed. Exercise or sitting down on the wound should be avoided for two weeks and the patient has to return slowly to normal activities.

In this study 44 patient with pilonidal sinus were managed with rhomboidoplasty reconstruction, we found (0%) recurrence rate for a minimum follow up period of 1 year and in comparison to other similar studies as U Jathwani et al<sup>[16]</sup> which had a recurrence rate of (1.5%). And Fateh et al<sup>[17]</sup> who had a significant (12%) recurrence rate, on the other hand had a much larger sample size and a longer period of follow up of 5 years.

Other studies CN Yogishwarappa et al<sup>[18]</sup>, Srikanth K<sup>[19]</sup>, Mulla SA et al<sup>[20]</sup> all gave a

(0%) recurrence rate which is the same result as the current study's.

Regarding wound infection, in this study, two patients (4,5%) developed wound infection both healed completely within two weeks with oral antibiotics and daily dressing without sequelae this result is acceptable and comparable to other studies as U Jathwani et al<sup>[16]</sup> patients (2,9%), Fateh et al<sup>[17]</sup> who had (3.3%) infection rate, Parwas et al<sup>[20]</sup> who had (1,6%) infection rate, Shauket et al<sup>[21]</sup> (4,8%), CN Yogishwarappa<sup>[18]</sup> with (1,9%), Srikanth K<sup>[19]</sup> who had (6.6%), Mulla SA et al<sup>[22]</sup> (5,8%) infection rate.

Three patients (6.8%) who developed post-operative seroma at the operation site which may be attributed to early removal of the suction drain 10 days post-operative. Following that, the author's strategy changed to a 14 days post-operative removal of suction drain. This result was higher than other studies as in U Jathwani et al<sup>[16]</sup> which had (4.4%) seroma development, Shauket et al<sup>[21]</sup> (1.6%), Srikanth et al<sup>[19]</sup> (3.3%). Neither wound dehiscence nor partial or complete flap necrosis developed. As compared to other studies which has a different ranges of wound dehiscence and flap necrosis respectively.

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**Table 2: Comparison between our study results and other studies results of the same procedure.**

Study	n	seroma	Infection	Dehiscence	necrosis	Recurrence
Fatih et al <sup>[17]</sup>	345	12(3.7%)	11(3.3%)	13(4%)	0	12(3.9%)
U Jethwani et al <sup>[16]</sup>	67	3(4.47%)	2(2.9%)	1(1.5)	1(1.5)	1(1.5)
Shaukat et al <sup>[21]</sup>	62	1(1.6%)	3(4.8%)	1(1.6%)	2(3.2%)	1(1.6%)
Parwaz S, Humera H., Gazala H. <sup>[20]</sup>	60	-	1(1.6%)	-	-	-
CN Yogishwarappa <sup>[18]</sup>	52	2(3.8%)	1(1.9%)	1(1.9%)	2(3.8%)	0
Srikanth K. <sup>[19]</sup>	30	1(3.3%)	2(6.6%)	3(10%)	1(3.3%)	0
Mulla SA et al <sup>[22]</sup>	17	2(11.7%)	1(5.8%)	0	3(17.64%)	0
Current study	44	3(6.8%)	2(4.5%)	0	0	0

### CONCLUSION:

Rhomboid flap is a very safe and effective method for treatment of pilonidal sinus disease due to its low complication rate especially recurrence and tissue necrosis. It also offers a closed method with minimal patient inconvenience as opposed to the more

conventional method of excision and leave open which requires wound care for a lot of time. The authors recommend strongly to adopt this method in treating all patients with pilonidal sinus disease whether it was primary or recurrent

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