

## Comparison Between Excision With Simple Primary Closure And Limberg's Flap Reconstruction In Pilonidal Sinus Disease

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### Abstract:

**Introduction:** The ideal treatment for pilonidal sinus should ensure low pain, short hospitalization period, low risk of complication, rapid return to normal activities, and should have a low recurrence rate. The aim of the study is comparison between excision with simple primary closure and excision with limbergs flap reconstruction in pilonidal sinus disease. **Materials and Methods:** The study was conducted in Government Medical College/Hospital, Anantapuram from January 2015 to October 2017 taking population size as 60, with two groups. Group A including 30 patients undergoing simple excision with primary mid line closure and, Group B including 30 patients undergoing rhomboid excision with LF reconstruction. Operative time, postoperative pain, duration of hospital stay, period off work, postoperative complication were calculated. **Results:** The duration of OT time was more in group B ( $46.23 \pm 4.34$  min) compared with group A ( $33.76 \pm 2.54$  min) with  $p < 0.00001$ . Postoperative pain VAS score (mean) in group A (4.2) is more than group B (2.33) with  $p$  value  $< 0.01$ . The number of days off work was more in group A ( $15.76 \pm 2.78$  days) than group B ( $13.56 \pm 1.67$  days) with  $p < 0.0001$ . Recurrence was observed in 6 patients (20%) in group A and in 1 patient (3.33%) in group B with  $p$  0.045. **Conclusion:** In Pilonidal Sinus Disease, excision with LF reconstruction is a very effective procedure in terms of less number of hospital days of stay, less postoperative pain, early return to work, less postoperative complications rates (wound infection, seroma, wound dehiscence) and low recurrence rate.

**Keywords:** Excision, Pilonidal sinus disease

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### I. Introduction

Pilonidal sinus is a condition that refers to a tract or cavity that contains loose hair and is associated with repeated infections and abscess formation. It is a blind track, which extends from the skin of natal cleft up to the pre-sacral fascia.

PS is most frequently seen in the sacrococcygeal region. In its natural course, it results in localized inflammation with abscess formation causing fistulae, sinus and chronic inflammation in the sacrococcygeal region.

Earlier it was considered as a congenital disease but currently known to be an acquired condition [1].

Various treatment modalities are developed for Pilonidal sinus (PS) disease till date, including non-operative management to surgical management such as various flap reconstructions.

The ideal treatment for pilonidal sinus should ensure low pain, short hospitalization period, low risk of complication, rapid return to normal activities, and should have a low recurrence rate [2].

Incidence of the PSD is 26 per 100,000 inhabitants. It is 2.2 times more often in men than in women. Age at presentation is 21 years for men and 19 for women [3].

The diagnosis of this condition is usually made quite easily. The patient's history suggests the problem. A painful and indurated swelling is the most common presentation of the acute process.

The aim of the present study is to compare excision with simple primary closure and excision with LF reconstruction in pilonidal sinus disease by various factors like the operative time, postoperative pain, duration of hospital stay, period off work, postoperative complications like wound infection, seroma, wound dehiscence, Recurrence rate.

## **II. Material And Methods**

A prospective comparative randomized controlled study done on comparison between simple excision with primary closure and excision with LF reconstruction in pilonidal sinus disease, all patients who presented to general surgery department of Government General Hospital/Medical College, Anantapuram between January 2015 to October 2017 satisfying the inclusion criterion with the informed consent were included in the study.

For ease of the study, two groups were considered. Group A including 30 patients undergoing simple excision with primary mid line closure and, Group B including 30 patients undergoing rhomboid excision with LF reconstruction. Randomization is achieved through computer generated schedule and the results are sealed into envelopes. The envelopes are drawn and opened by a nurse in operating room.

This study design is a use of electro cautery (mono polar & bipolar), suction drains (Romovac 14 F) and skin sutures are standardized and used in both the procedures. And both the surgeries are performed by the same surgeon.

### **Inclusion Criterion:**

Patients within age group of 18 to 60 years of either sex,  
Patients with discharging sinus at the natal cleft,  
Patients who are willing to contact postoperatively

### **Exclusion Criterion:**

Patients < 18 years and >60 years,  
Patients with poor general conditions like malignancy, renal failure, bleeding diathesis, fistula in ano, actinomycosis, tuberculosis, acute pilonidal abscess.

After routine hematological work up of the patient and once Pre anesthetic checkup is completed patients are taken up for the surgery. After giving prophylactic antibiotic and spinal anesthesia patient should be placed in jack knife position and the buttocks are retracted using adhesive tape to obtain a better visualization of the operative field.

### **Group A Patients underwent Excision with Primary Closure:**

The external opening of the sinus is gently cannulated. Thereafter, all the tracts are excised by a vertical elliptical incision up to the presacral fascia. After appropriate hemostasis using unipolar and bipolar cautery and thorough wash given a 14F romovac suction drain inserted into the defect. Defect is then closed using interrupted 3-0 Polyglactin (vicryl™; Ethicon) and the skin edges are approximated with 3-0 Polypropylene (prolene™; ethicon) (Fig.1&2).



**FIGURE 1:** Elliptical excision of the sinus and tracts.



**FIGURE 2:** Skin sutured with drain in situ.

**Group B patients with Rhomboid Excision with Limbergs Flap Reconstruction:**

The skin is marked by a marker pen. The involved area is excised by a rhomboid excision (abcd). An incision line de equal to the sides of rhomboid is created midway between extension of line cd and the horizontal axis. Another incision ef of the same length is made on the vertical axis to raise a fasciocutaneous rhomboid Limberg flap (cdef). Once adequate hemostasis is attained, after a thorough wash, a 14F romovac suction drain kept in the defect and sutured to the surrounding skin. This flap is transposed to the excised area. Subcutaneous tissue and skin were sutured separately without tension using polyglactin and polypropylene interrupted sutures and dressing done (Fig.3&4).



**FIGURE 3:** Rhomboid excision with flap transfer.



**FIGURE 4:** Skin approximated with drain in situ.

After Excision of sinus tract from group A & B, sent for Histopathology examination for confirmation of inflammation of sinus tract.

Postoperative instructions were given to patients regarding mediations diet, sleeping posture, hygiene measures and also advised not to squat/ flex hip joint, not to do strenuous exercises. Patients are advised to come after one week for wound inspection and suture removal is done generally 2weeks after surgery. Patients can even undergo laser epilation of hair at the natal cleft by consulting dermatologist. Follow up was done 1, 2 and 4weeks and 3, 6 and 12months after surgery.

Postoperative complications like wound infection, seroma/hematoma, wound dehiscence, recurrence, delayed wound healing was observed. Operative time, postoperative pain, duration of hospital stay, days off work, complications were analyzed between two groups and tabulated.

**Statistical Analysis:**

Data were expressed as mean values ± standard deviation/ standard error, percentages (%), and numbers (n). The statistical analysis is performed by a statistician using Windostat Version 9.2. Two statistical tests were primarily used to analyze the data.

Unpaired t-tests were used to analyse differences between two groups.

Differences in operative time, postoperative pain (VAS), duration of hospital stay, days off work and complications are analysed using ANOVA (analysis of variance).

p value less than 0.05 is taken significant, p value more than 0.05 is insignificant.

**III. Results**

Pilonidal sinus disease was predominantly seen in males. Out of 60 studied group, 45% of males were underwent simple excision with primary midline closure and 43.3% of males underwent rhomboid excision with LF reconstruction. 7 (11.6%) out of 60 females had pilonidal sinus disease.

Most of the patients presented with pilonidal sinus disease were in the age group of 21 – 30 years.Wound infection (20%), Seroma (13.33%), wound dehiscence (3.33%) were most commonly observed in simple excision with primary midline closure when compared with rhomboid excision with LF reconstruction, was 3.33% of wound infection &seroma each. Wound dehiscence was not observed in Rhomboid excision with LF reconstruction.20% of recurrence rate was seen in Group A and 3.33% of recurrence rate in Group B (Table 1).

**Table 1:** Different parameters compared between two groups

Parameters	Group A (n=30)	Group B (n=30)
<b>Sex</b>		
<b>Males</b>	27(90%)	26(86.66%)
<b>Females</b>	3(10%)	4(13.33%)
<b>Age group in years</b>		
≤20	1(3.33%)	0
21-30	23(76.66%)	28(93.33%)
≥30	6(20%)	2(6.66%)
<b>Complications</b>		
<b>Wound infection</b>	6(20%)	1(3.33%)
<b>Seroma</b>	4(13.33%)	1(3.33%)
<b>Wound dehiscence</b>	1(3.33%)	0
<b>Recurrence</b>	6(20%)	1(3.33%)

The mean value of OT time in minutes was 33.7±2.5.Hospital stay in days and days off work mean was 3.9±0.8 and 15.7±2.7 respectively. Significance shown in parameters including OT time in minutes, recurrence, wound infection, days off work, VAS score between Excision with simple primary closure and Excision with LF reconstruction (Table 2).

**Table 2:** Assessment of significance of different variables

Variable	Simple Excision	S.D	Limberg Flap	S.D	T Test	Probab ility	Signific ance	Mann Whitne y	Probabi lity
<b>Age</b>	26.900	4.397	26.267	3.930	0.588	0.559	NS	426.000	0.365
<b>Sex</b>	1.100	0.305	1.133	0.346	0.396	0.694	NS	117.000	0.000
<b>OT Time Minutes</b>	33.767	2.542	46.233	4.345	13.566	0.000	SS	-	0.000

<b>Hospital Stay in Days</b>	3.933	0.828	3.733	0.785	0.960	0.341	NS	402.000	0.243
<b>Recurrence</b>	0.200	0.407	0.033	0.183	2.047	0.045	SS	257.000	0.002
<b>Wound Infection</b>	0.200	0.407	0.033	0.183	2.047	0.045	SS	234.000	0.001
<b>Seroma</b>	0.133	0.346	0.033	0.183	1.401	0.167	NS	181.000	0.000
<b>Wound Dehiscence</b>	0.033	0.183	0.000	0.000	1.000	0.321	NS	-	
<b>Days Off Work</b>	15.767	2.788	13.567	1.675	3.705	0.000	SS	255.000	0.002
<b>VAS Score</b>	4.200	0.714	2.333	0.479	11.883	0.000	SS	29.000	0.000

NS – Not Significant; SS – Statistically significant

#### IV. Discussion

Although certain nonsurgical treatment options for treating the condition are still available, but now the consensus for treating it surgically has evolved. A full basket of techniques ranging from simple curette to extensive flap techniques have been published so far. Conceptually, an ideal procedure, in addition to eradicating the disease, should also eliminate the natal cleft so as to take off the anatomical predisposition for the recurrence of the sinus. The procedure should also count well on other parameters such as technical simplicity, hospitalization period required, and off work period.

In the current study, group A (simple excision with primary closure) consists of 30 patients (27 males and 3 females), group B (RELFL) consists of 30 patients (26 males and 4 females). The sex distribution in our study indicates PSD is more common in males than females as stated in study conducted by Azad AS [4].

PS incidence is higher in male than female and increase with obesity and hairy skin.<sup>2</sup> PS is more common in people aged 15–30 years, after puberty due to the effect of sex hormones on pilo-sebaceous glands and change in healthy body hair growth [5].

In the current study the mean age of patients in group A is 26.9±4.39 years (range 19-38) and mean age in group B is 26.26±3.92 years (range 21-38) which is in comparison with the previous studies [5]. It is more common in younger age group due to the hormonal influence, sedentary working condition like sitting for long duration, wearing tight jeans and obesity due to junk food.

In most of the previous studies recurrence was 0-3% [6-8]. for LF technique and 7-42% [3,9] for simple excision with primary midline closure. In current study, recurrence is observed in 1 (3.33%) patient who underwent LF technique and 6 (20%) patients who underwent simple excision with mid line closure. p value 0.045 is significant. This states that LF is having less recurrence rates than simple excision with primary closure.

Male gender, obesity, occupations requiring sitting, deep natal clefts, excessive body hair, poor body hygiene and excessive sweating are described as the main risk factors. Stiffness of body hair, number of baths and time spent seated per day were the three most predictive risk factors [10,11].

Akca et al [12] have documented a median operative period 60 min for the LF group against 45 min for the primary midline closure group, and the difference has been found to have p value of 0.001. Whereas Abu Galala et al [13] have observed an insignificant difference in the operative time periods of the two techniques. In current study, the mean OT time for LF was 46.23±4.34min, while for simple excision with primary closure it was 33.76±2.54min with a p value of less than 0.000001 rendering it statistically significant. Because of the extensive dissection and raising the flap above from gluteal fascia and suturing the flap over the defect led to longer OT time for flap technique.

Literature documents a hospital stay of 1–5 days and 2 – 4 days for the primary midline closure and LF techniques, respectively. In the current study, hospital stay of 3.93±0.8 days was observed in simple excision and 3.73±0.7 days were observed in patients of LF (p value 0.340).

In the current study, postoperative pain VAS score is 4.2±0.71 in group A and 2.33±0.47 in group B with a significant p value of less than 0.001. The results were similar to those obtained for Mahdy [14] and Akca et al [12]. The significant less pain in LF group was because it avoids the wound tension at the suture sight due to lateralization of the suture away from the midline rendering less pain to the patients. Therefore LF is more comfortable to the patient.

The consideration of a financial burden in the surgical management of pilonidal sinus assumes more importance because the disease is an affliction of mainly the second and third decades of life. Previous studies reveal 7–17.5 days [8,15,16]works off period for the LF and 21–23 days [13,17] for the midline primary closure. In this study, group A had mean 15.76±2.78 days off work and group B had 13.56±1.67 days off work (p value

0.00047) rendering faster healing and early ambulation and early return to duty in group B patients. Faster healing has a good impact on social and financial condition of the patient.

Published studies documented a wound infection rate and a wound disruption rate of up to 12.4% [18] and 5– 10% [5], respectively, for the primary midline closure technique, while published values of such parameters for the LF group are 1.5–6.5% [12, 19] and 0.9– 3.9% [20,21] respectively. In this study, wound infection is observed in 6 patients (20%), wound dehiscence is seen in 1 patient (3.33%) and seroma is seen in 4 patients (13.33%) in group A. In group B, Wound infection seen in 1 patient (3.33%), seroma is seen in 1 patient (3.33%) and there is no wound dehiscence seen in this group. The results were in comparison with previous studies. In contrast to our study, Akin Onder [22] observed postoperative complication rate is higher in the LF method than primary closure method(p = 0.039). Postoperative complications and recurrence are contributed by several factors like poor body hygiene, obesity, smoking and size of sinus [10].

The significant high wound infection in group A is because of high wound tension in midline closure causing disruption of the sutures and leading to wound infection.

The present study was compared to few other studies in relation to Operation time, VAS score, Hospital stay, Days off work, Post-operative complications. Study correlates well with other studies (Table 3).

**Table 3:** Comparison of results with other studies

	No. of patients		OT Time (min)		VAS Score		Hospital Stay(days)		Days off work		Recurrence (%)		Complications (%)		W.I		Seroma		W.D	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Mahdy et al [14]	20	10			6.1	7.4	4.8	2.9	25.5	14.8	25	5			20	0			10	0
Tufale A. Dass et al [23]	40	40	43.5	47.6	4.2	3.8	2.3	1.77	12.5	10.8	7.5	0			12.5	5	2.5	7.5	5	0
ParwezSajad Khan et al [24]	60	60	55	70			5	2	20	9	5	0			7	1			4	0
AhmetSerdarKaraca et al [25]	315	234	27.2	59.6			3.0	2.69	33.2	16.3	9.2	7.1	17.8	17.9						
Current study	30	30	33.7	46.2	4.2	2.3	3.9	3.7	15.8	13.6	20	3.4	36.3	6.7	20	3.3	13.3	3.3	3.3	0

In 2010, Darwish and Hassanin [26] described LF in reconstruction after excision of sacrococcygeal pilonidal sinus is reliable, easily performed, associated with complete cure and low postoperative complications.

In 2010, Muzi et al [27] described LF method has better outcomes compared with excision and primary closure. LF showed less convalescence and wound infection; their technique of tension-free primary closure was a day case procedure, less painful, and shorter than LF. Recurrence was observed in 3.84% versus 0% in the primary closure versus LF group (p - 0.153).

### V. Conclusion

Pilonidal sinus is more common in males and during third decade of life. Surgical treatment is the cornerstone in the management of PSD. Limberg flap technique is more time consuming procedure than simple excision with primary closure but has many advantages over it including less postoperative pain, Decreased hospital stay, early return to work, less postoperative complications and recurrence. So, we conclude that excision with LF reconstruction is more effective and more comfortable to the patient than simple excision with primary midline closure in pilonidal sinus disease.

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