

## Original Research Article

# Limberg flap versus primary closure in the treatment of pilonidal sinus: a randomised clinical study

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**Received:** 21 June 2021

**Revised:** 07 July 2021

**Accepted:** 08 July 2021

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## ABSTRACT

**Background:** Pilonidal sinus is a chronic disease usually involving the sacrococcygeal area. Various treatment modalities exist, yet few comparison studies exist to compare the efficacy of one modality over the other. Hence this randomized clinical study was undertaken as an attempt to compare the outcomes of pilonidal sinus following Limberg flap procedure and primary closure.

**Methods:** 60 patients undergoing surgery for pilonidal sinus disease were considered for the study. 30 patients underwent excision and primary closure and 30 patients underwent Limberg flap repair. They were followed up for 1 year. Duration of hospital stay, duration of inability to work, postoperative infection, wound dehiscence, and postoperative recurrence in a follow up period were recorded. Descriptive statistics, chi-square tests and independent t-test are the statistical tools employed.

**Results:** Mean age was 29.83±4.99 years. Male:female ratio was 5.66:1. The mean duration of hospitalization in group A was significantly less ( $p < 0.05$ ) than group B. The patients in group B returned early to routine work (21.56±3.92 days) as compared to 30.5±5.92 days in group A ( $p < 0.05$ ). 5 of 30 patients in group A and 2 of 30 in group B developed surgical site infection. ( $p > 0.05$ ). 4 patients developed wound dehiscence in group A only which was found to be statistically significant.

**Conclusions:** Limberg flap in treatment of pilonidal sinus is associated with shorter hospitalization, early return to routine work and less wound dehiscence as compared with excision and primary closure. Wound infections are comparable with both the modalities.

**Keywords:** Pilonidal sinus, Limberg flap, Excision and primary closure, Recurrence, Wound infection, Wound dehiscence

## INTRODUCTION

The word pilonidal sinus is derived from Latin, meaning 'nest of hairs'. It is a chronic disease, usually involving the sacrococcygeal area, with an approximate annual incidence of 26 per 1,00,000 population.<sup>1,2</sup> It may present as an abscess or a cyst or as sinus tracts with or without discharge.<sup>3</sup> Men are usually more commonly affected than women, and it is more common in the middle age.<sup>1</sup>

Traditionally, the treatment options have varied from incision and drainage to laying open, to marsupialization, excision and primary closure or rhomboid excision with Limberg flap procedure.<sup>4</sup>

The studies on the outcomes of these procedures have shown varying results. A recurrence rate of 7-42% has been reported following excision and primary closure while that following Limberg flap has been reported to be

about 3%.<sup>5</sup> While most of the literature on this topic has been limited to single surgical approach, the comparative studies in this field are very few. Hence this randomized clinical study was undertaken an attempt to compare the outcomes of pilonidal sinus following Limberg flap procedure and primary closure.

## METHODS

This was a prospective randomised control study conducted between months of December 2015 to June 2017. The sixty patients diagnosed with pilonidal sinus admitted in Victoria hospital and Bowring and Lady Curzon hospital, Bangalore were included in the study. Ethical committee clearance was obtained. The patients were when randomly divided into two groups, group A as well as group B, who underwent the procedures as follows:

In group A, a vertical elliptic incision was made and was deepened to reach up to the sacrococcygeal fascia and the lesion was excised. After achieving hemostasis, a suction drain was put in and wound was closed back primarily.

In group B, a rhomboid-shaped incision was made, with each side equal in length, around the mouth of the sinus. The incision was deepened to excise the lesion. The rhomboid flap then rotated from gluteal fascia to the excised area without tension. Using interrupted sutures, the subcutaneous tissue and skin was sutured.

Suction drain was routinely used in both groups. Patients were given IV antibiotics for first 24 hours followed by oral antibiotics for next 10 days. Skin sutures were removed on the tenth post-operative day.

Patients between the age groups of 18-40 years with primary pilonidal sinus giving consent for participation in the study were included in the study.

Patients with recurrent disease, patients below 18 years and above 40 years of age, and those not giving consent for participation in the study were excluded from the study.

Patient details such as name, age, sex, the group to which they were allotted were noted down. They were followed up regularly. Details such as length of hospital, duration of inability to work, post-operative infection, wound dehiscence and post-operative recurrence were recorded. The follow up was done regularly for a period of one year.

The collected data was tabulated and analysed. Descriptive statistics such as mean and standard deviation was used to describe the data. Student t test and chi square test has been used to test the difference of

significance between the two groups. A p value of less than 0.05 was considered statistically significant.

## RESULTS

The 9 (15%) of the 60 patients were females while 51 (85%) were males. Mean age of patients in our study was found to be 29.83±4.99 years. Maximum incidence of the disease was found to be in the age group of 25-29 years.

The distribution of incidence of pilonidal sinus among the different occupations as observed in our study is shown in Table 1.

**Table 1: Occupations associated with pilonidal sinus.**

Occupations	Numbers	Percentage (%)
Student	9	15
Tailor	2	3.33
Bus driver	5	8.33
Clerk	8	13.33
Housewife	2	3.33
Farmer	9	15
Auto driver	5	8.33
Shopkeeper	5	8.33
Engineer	2	3.33
Labourer	4	6.67
Taxi driver	3	5
Mechanic	1	1.67
Barber	2	3.33
Cook	1	1.67
Police constable	2	3.33

The mean BMI of patients in group A was 24.35±2.70 kg/m<sup>2</sup> while that in group B was 25.40±2.60 kg/m<sup>2</sup>.

The complications assessed were wound infection and wound dehiscence. In our study, five out of thirty patients in group A and two out of thirty patients in group B developed surgical site infection, which was statistically not significant among the groups. However, four patients developed wound dehiscence in group A only which was found to be statistically significant (Table 2).

The morbidity of the surgery was measured in terms of mean duration of hospital stay and duration to return to routine work. There was a statistically significant difference between the mean duration of hospital stay and the mean duration to return to routine work among the two groups (p<0.05) (Table 3).

In a follow up period of one year, recurrence was noted in seven out of thirty patients of group A and one out of thirty patients of group B which was found to be significantly less (p<0.05).

**Table 2: Incidence of post op complications among the two groups.**

Post-op complications	Group A		Group B		P value
	N	%	N	%	
<b>Infection</b>	5	8.33	2	3.33	>0.05
<b>Wound dehiscence</b>	4	6.66	0	0	<0.05

**Table 3: Comparison of morbidity among 2 groups.**

Variables	Group A	Group B	P value
	Mean±SD (days)	Mean±SD (days)	
<b>Duration of hospital stay</b>	6.83±1.53	4.66±1.27	<0.05
<b>Duration of return to routine work</b>	30.5±5.92	21.56±3.92	<0.05

## DISCUSSION

Pilonidal disease is a common problem affecting the young. It is under reported and yet it does significantly cause discomfort and morbidity to the patients that draws them to the surgeons-mostly when complications of the disease arise. Definitive treatment is best provided when the patient initially presents to the surgeon to prevent loss of time from work and distress to the patient.

Pilonidal sinus is more commonly found in males as compared to females. The male:female ratio in our study was found to be 5.66:1. Similar results were observed by Karaca et al who observed male:female ratio to be 5.31:1.<sup>6</sup> Tavassoli et al observed male: female ratio of 4:1 in a study of 100 patients.<sup>7</sup> Men are thought to be at higher risk because of their more hirsute nature.

The complications assessed in our study were wound infection and wound dehiscence. In our study 5 of 30 patients in group A and 2 of 30 patients in group B developed surgical site infection, which was statistically not significant among the groups. However, four patients developed wound dehiscence in group A only which was found to be statistically significant.

The morbidity was measured in terms of mean duration of hospital stay and duration to return to routine work. The mean duration of hospitalization in group A was 6.88±1.53 days and mean duration of hospitalization in group B was 4.66±1.26 days which was significantly less ( $p < 0.05$ ). The patients in group B returned early to routine work (21.56±3.92 days) as compared to 30.5±5.92 days in group A which was found to be statistically significant.

A randomised control trial by Tavassoli et al comparing excision with primary repair and rhomboid excision with Limberg flap in 100 patients reported an early wound healing and return to work among the patients with rhomboid excision and lumber flap.<sup>7</sup>

Similar studies by Khan et al and Elshazly et al reported lower morbidity and recurrence rates among patients undergoing rhomboid excision with Limberg flap.<sup>8,9</sup>

## Limitations

A larger sample size will provide better validation of results.

## CONCLUSION

The results of this series provided further evidence that wide excision with a modified Limberg transposition flap reconstruction is a very effective operative procedure for uncomplicated pilonidal sinus, associated with a low complication rate, short hospitalization and disability, and a low recurrence rate. Wound infections are comparable with both the modalities.

## ACKNOWLEDGEMENTS

Author would like to thank the patients who consented for participation in the study.

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: The study was approved by the Institutional Ethics Committee*

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**Cite this article as:** Devaprashanth M, Srinivas NM, Akhilandeshwari N. Limberg flap versus primary closure in the treatment of pilonidal sinus: a randomised clinical study. *Int Surg J* 2021;8:2388-91.