

# Open Method Versus Flap Closure in Pilonidal Sinus in a Rural Tertiary Care Hospital, Karnataka- A Cohort Study

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## ABSTRACT

**Introduction:** Open excision is one of the simple surgical techniques for the correction of pilonidal sinus, in the recent times, the rhomboid excision with limberg flap is being practiced commonly due to increased patient's satisfaction, reduced pain, etc.

**Aim:** To assess the surgical outcome of open excision and rhomboid excision with limberg flap for the correction of pilonidal sinus.

**Materials and Methods:** A hospital-based cohort study was done among patients with pilonidal sinus requiring surgical treatment, in Department of Surgery in Adichunchangiri Institute of Medical Sciences and Research Centre, B.G. Nagar, Bellur, Mandya District, Karnataka, India. The study was conducted during June 2018 to December 2019. Participants who underwent open excision were included in group A (n=40) and rhomboid

excision with Limberg's flap were included in group B (n=40). Patients were followed-up for a period of one month. The key outcome assessed were mean duration of surgery, pain during the first three postoperative days, time taken for discharge and return to work, complications and patients satisfaction. Analysis was done using Statistical Package for Social Science (SPSS) version 20.0.

**Results:** Rhomboid excision with Limberg's flap was found to be significantly better than open excision method in terms of pain, duration of hospital stay, time taken to return to profession, patient's satisfaction and overall complications but there were no significant difference noted with respect to individual complication and duration of time taken for surgical procedure.

**Conclusion:** Rhomboid excision with Limberg's flap is comparatively better than open excision.

## INTRODUCTION

Pilonidal Sinus Disease (PSD) is one of the commonly acquired chronic inflammatory diseases usually resulting in abscess and sinus formation in natal cleft of sacrococcygeal region [1]. It is more predominantly reported among the younger adults compared to other age groups [2] who do work in sitting posture for a long time and as a result of it penetration of shed hair shafts through the skin occurs resulting in sinus formation [3]. The incidence of PSD is estimated as 26/100,000 people, with male predominance and the common age being late second decade and early third decade of life [4]. It was reported that obesity, sedentary lifestyle, local irritation and trauma are commonly associated with development of pilonidal sinus [5,6].

Though the disease is benign in nature, it carries very high postoperative morbidity and patient discomfort [4]. In the recent times, several treatment modalities were tried to ease and reduce the patients discomfort from conservative non surgic treatments to extensive resections followed by flap procedures [4,7,8]. As a result of it, surgical treatment is considered as a better option than conservative methods and complete removal of the sinus tract with appropriate reconstruction is considered as a best technique for successful recovery [9]. The commonly practiced surgical techniques include incision and drainage, open excision [10], excision and primary closure [11], bascom's flap [12], kardaykis flap [13] and rhomboid excision with limberg flap [14,15]. Another important factor that needs to be considered is that difficulty or complexity in performing these flap techniques. Though open excision is one of the simple surgical techniques for the correction of pilonidal sinus, in the recent times, the rhomboid excision with limberg flap is being practiced commonly due to increased patient's satisfaction, reduced pain, etc. Hence the hypothesis formulated was to check whether limberg's flap is better than open excision or not.

**Keywords:** Limberg's flap, Open excision, Rural population

This study was conducted with the objective to compare the outcome of open excision and rhomboid excision with limberg flap in terms of pain during the first three postoperative days, time taken for discharge and return to work, complications and patients' satisfaction.

## MATERIALS AND METHODS

A hospital based cohort study was done among patients with pilonidal sinus requiring surgical treatment, in Department of Surgery in Adichunchangiri Institute of Medical Sciences and Research Centre, B.G. Nagar, Bellur, Mandya District, Karnataka, India, a rural tertiary care hospital during June 2018 to December 2019. This study was approved by Institutional Ethics Committee (AIMS/IEC/2170/2019-20).

**Inclusion criteria:** All with pilonidal sinus disease invariable of age and gender were included in the study.

**Exclusion criteria:** Cases, who already operated for pilonidal sinus were excluded from the study.

A total eighty cases was included in the study. Patients were divided into two groups based on computer generated random numbers in this study. Written informed consent was obtained from the study participants before conducting the study. Participants who underwent open excision were included in group A (n=40) and rhomboid excision with limberg's flap were included in group B (n=40).

**Sample size calculation:** Based on the literature [16] with mean Visual Analogue Scale (VAS) for pain as 1.5 in flap group and 3 in open excision group with sigma of 1.8, alpha of 0.05, power of 0.95, the sample size was calculated as 38 in each group and then it was rounded to 40 per each group.

### Study Procedure

The intergluteal area was shaved a day before the surgery. As a prophylaxis, parenteral broad-spectrum antibiotic was given to all patients half hour before the surgery (Cefepime 2 g). All patients were operated under spinal anaesthesia. Patients were placed prone with lateral traction of the buttocks with wide adhesive tapes. Sterilisation of the surgical area was done with povidone-iodine solution. Delineation of the course of the sinus was done by injection of methylene blue (1-3 cm) or introduction of blunt probe to avoid missing of excision of any side tracks.

For the entire group A cases, a vertical elliptical incision was made around the sinus, extending to the presacral fascia. Excision was at least one cm away from the sinus and after achieving haemostasis wound was packed with gauze and dressings done.

For the entire group B cases, a rhomboid-shaped incision was made around the sinus. The long axis is incised to excise the entire sinus and its extensions and the other axes are rotated to cover the midline defect in such a way that the resultant closure is via a midline suture. A vacuum drain was placed, the skin closed, and antibiotics were started.

Following surgery, every day the wound was examined for any signs of surgical site infections till the patient gets discharge. Both groups of patients were given similar analgesics and antibiotics. Dressings were done daily and followed-up for one month. The key outcome assessed were mean duration of surgery, pain during the first three postoperative days, time taken for discharge and return to work, complications and patients' satisfaction.

### STATISTICAL ANALYSIS

Analysis was done using statistical package for social sciences version 20. Chi-square test, Independent sample t-test and z-tests were used appropriately. The p-value <0.05 was considered as significant.

### RESULTS

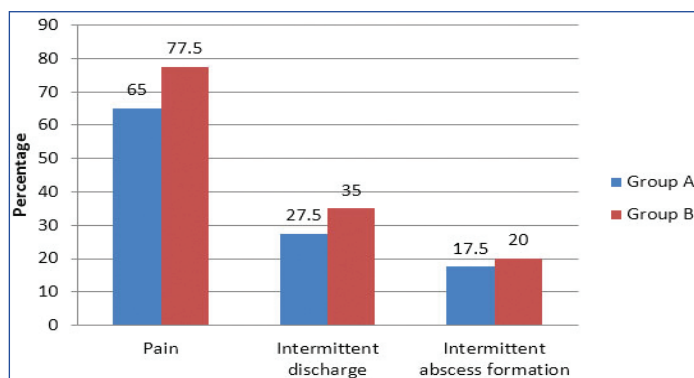
Both the groups were similar in terms of age, gender and body mass index, with no statistical significant differences [Table/Fig-1] and presenting symptoms in [Table/Fig-2].

Variable	Group A N (%)	Group B N (%)	p-value
<b>Age group (years)</b>			
≤20	12 (30)	10 (25)	0.9184
21-30	20 (50)	23 (57.5)	
31-40	5 (12.5)	4 (10)	
>40	3 (7.5)	3 (7.5)	
<b>Gender</b>			
Male	33 (82.5)	29 (72.5)	0.2841
Female	7 (17.5)	11 (27.5)	
<b>BMI (kg/m<sup>2</sup>)</b>			
18.5-25	16 (40)	12 (30)	0.5685
25.1-30	17 (42.5)	18 (45)	
>30	7 (17.5)	10 (25)	

[Table/Fig-1]: Clinical profile of the study participants. Chi-square test was performed; BMI: Body mass index

Mean duration of surgery in group A and group B was found to be statistically insignificant. The difference in mean VAS score on postoperative day one, two and three between the group A and group B was found to be statistically significant. Mean duration of hospital stay and time taken to return to profession was also found to be statistically significant [Table/Fig-3].

Difference in proportion of overall complications in group A and group B was found to be statically significant [Table/Fig-4]. Difference in patient's satisfaction in group A and group B was found to be statistically significant [Table/Fig-5].



[Table/Fig-2]: Presenting symptoms among the study participants.

Variable	Group A	Group B	p-value
Mean duration of surgery (in minutes)	45.3±14.7	52.8±19.4	0.0549
<b>Mean VAS score</b>			
POD day 1	6.5±2.1	4.8±2.6	0.0019*
POD day 2	5.2±1.7	3.3±1.3	<0.0001*
POD day 3	4.2±0.8	2.6±0.5	<0.0001*
Mean duration of hospital stay (in days)	6.9±3.2	4.6±2.7	0.0008*
Time taken to return to profession (in days)	10.8±4.2	8.3±3.0	0.0030*

[Table/Fig-3]: Comparison of surgery related parameters. \*significant; Independent sample t-test; POD: Postoperative day

Complications	Group A N (%)	Group B N (%)	p-value
Seroma	5 (12.5)	2 (5)	0.2382
Haematoma	3 (7.5)	1 (2.5)	0.3079
Infections	4 (10)	1 (2.5)	0.1685
Overall complications	12 (30)	04 (10)	0.0263*

[Table/Fig-4]: Comparison of complications between two groups. \*significant, z-test

Patient satisfaction	Group A N (%)	Group B N (%)	p-value
Present	32 (80)	38 (95)	0.0425*
Absent	8 (20)	2 (5)	

[Table/Fig-5]: Comparison of patients' satisfaction in two groups. \*significant; Chi square test

### DISCUSSION

The present study shows that the limberg flap is comparatively better than open excision in terms of mean postoperative pain, mean duration of hospital stay, time taken to return to profession, overall complications and patient's satisfaction.

Muzi MG et al., conducted a study and reported that success of surgery was achieved in 84.6% of cases who underwent limberg flap whereas 77.7% of cases who underwent primary closure, which was found to be statistically insignificant [16]. Operative time for primary closure was reported as shorter than flap procedure whereas as wound infection was more in the primary closure group than flap procedure. Less postoperative pain was reported by flap group and no significant difference was found in time off from work.

Akhunzada TS et al., performed a study in urban area among the cases who underwent surgery using limberg's flap and reported that mean operating time was 70 minutes, mean length of hospital stay was 3.30 days, mean return to work in weeks was 3.5 with one case being reported with superficial wound infection [17]. The findings of this study were consistent with the findings of the present study though the present study was done in rural population.

Jamal A et al., reported that duration of surgery was significantly longer in the limberg's flap group whereas the pain was marked low in this group [18]. Total hospitalisation period, time taken for wound healing and recurrence were significantly low in lamberg's flap group compared to the open excision group. This study was done in a

mixed population of both rural and urban and the finding of this study was found to be consistent with the findings of our study.

Bali I et al., performed a study and reported that during the immediate postoperative period fluid collection, wound infection, flap oedema, haematoma and partial wound separation were low in lamberg's flap group [19]. During the average follow-up of 28 months, none of the patients presented with recurrent disease in the limberg's flap group. Early surgical complications were significantly low in limberg's flap group compared to open excision group. Abdelraheem O and Khalil M et al., conducted a study and reported that limberg's flap group showed significant early return to work and less postoperative pain compared to open excision group whereas incidence of wound dehiscence, postoperative haematoma and seroma were less among open excision group compared to limberg's flap group but the difference was not statistically significant [20]. Shabbir F et al., in their study reported that infection rates were 7% in modified lamberg's flap group and 26.6% in the open excision group and the difference in proportion was found to be statistically significant [21]. Average hospital stay was  $1.63 \pm 0.67$  days in modified lamberg's flap group whereas it was  $2.8 \pm 1.24$  days in open excision group. They concluded that modified limberg's flap closure is an effective treatment modality when compared to open excision, for PSD, with 1.5 times lesser rates of infection, 4 times lesser recurrence rate and 40% reduction in in-hospital time. All these three studies were done in urban population and the results were consistent with the findings of this study.

Khan PS et al., conducted a study and reported that duration of hospital stay and time to resumption of work, postoperative complications were less in group who underwent limberg's flap compared to those who underwent open excision [22]. Also, no recurrence reported in limberg's flap group during the follow-up period of two years. They stated that limberg flap procedure is better than the simple excision and primary closure for the management of sacrococcygeal pilonidal disease.

Jabbar MS et al., performed a study and reported that both primary closure with limberg flap and open procedure are comparable options when considering wound infection [23]. No statistical significance was seen in the incidence of postoperative infections, between the two surgeries. Enriquez-Navascues JM et al., in their meta-analysis reported that on comparing the different flap techniques Bascom and limberg flap there was no difference was found in recurrence or wound complications rate [24].

Kaser SA et al., conducted a study and reported that no significant differences were found in postoperative pain, pain during work and overall satisfaction at 3 weeks postoperative among the open excision group and limberg's flap group [25]. Complication rates were significantly more in limberg's flap group compared to open excision group. They stated that primary wound closure with a limberg flap was not advantageous over secondary wound healing.

This comparison between the present study and other studies on the literature shows that invariably there is no difference in the population on which the procedure is performed, the outcome in terms of mean postoperative pain, mean duration of hospital stay, time taken to return to profession, overall complications and patient's satisfaction were similar.

### Limitation(s)

The surgical procedure in this study was done by a single unit surgeon, thus variability could be there when assessed with different surgeons.

### CONCLUSION(S)

Rhomboid excision with limberg's flap was found to be significantly better than open excision method in terms of pain, duration of

hospital stay, time taken to return to profession, patient's satisfaction and overall complications but there were no significant difference noted with respect to individual complication and duration of time taken for surgical procedure. Thus, it was concluded that rhomboid excision with limberg's flap is comparatively better than open excision. We recommend Limberg's flap over open excision in future, in order to reduce mean postoperative pain, mean duration of hospital stay, time taken to return to profession, overall complications and improve patient's satisfaction. Also, future studies could focus on vulnerable population like obese individuals, drivers, etc., in order to assess the outcome in these population.

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