

**A Comparative Study of Various Common Surgical Procedures for Pilonidal Sinus**

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**Citation this Article:** Dr. Datar Singh , Dr. Shyam Bhutra, Dr. Bhagchand Khorwal, Dr. U. S.Parihar, Dr. Chetan Mahala, Dr. Sukhveer, Dr. Jagdish Singh, “A Comparative Study of Various Common Surgical Procedures for Pilonidal Sinus”, IJMSIR- June - 2020, Vol – 5, Issue -3, P. No. 07 – 14.

**Type of Publication:** Original Research Article

**Conflicts of Interest:** Nil

**Abstract**

**Background:** Pilonidal sinus is a chronic inflammatory process of the skin and subcutaneous tissue of the sacro-coccygeal region. It presents clinically as a depression or one or multiple holes in the midline in the intergluteal cleft. In the course of the disease, the inflammation may exacerbate or even an abscess may form.

**Methods:** This prospective comparative study was conducted on 75 cases of symptomatic or recurrent pilonidal sinuses admitted to surgical wards of J.L.N. Medical College & Associated Hospitals, Ajmer from July 2017 to July 2019.

**Results:** The mean days of hospitalization in Limberg's rhomboid flap was 6.8±1.5 days, for primary closure it was 8.08±2.9 days and for laying open technique it is 12.96±1.3 days and P-value was <0.001 (Highly significant).The mean days of wound healing in

Limberg's rhomboid flap are 16.6±5 days, for primary closure it is 20±9.2 days and for laying open technique it is 49.5±7.8 days and P- value - <0.001 (highly significant)

**Conclusion:** In conclusion, despite a longer operating time, rhomboid excision and Limberg flap closure, with its low complication rate and acceptable long-term results, is preferable to simple excision and primary closure in the treatment of SPD.

**Keywords:** Pilonidal sinus, Simple excision, Complication

**Introduction**

Pilonidal sinus is a chronic inflammatory process of the skin and subcutaneous tissue of the sacro-coccygeal region. It presents clinically as a depression or one or multiple holes in the midline in the intergluteal cleft. In the course of the disease, the inflammation may exacerbate or even an abscess may form.<sup>1</sup>

Pilonidal cyst is usually diagnosed in young males (4 times more often than in females), usually of Caucasian descent, less frequently African or Asian, most commonly after puberty (mostly in 2nd and 3rd decade of life). In females, the disease develops at a younger age, which is probably due to earlier beginning of puberty.<sup>2</sup>

Treatment of a pilonidal cyst is difficult due to low efficacy of therapeutic methods. Clinical assessment is necessary, and the choice of proper management depends on disease stage. In the case of a shallow (depth less than 2cm) lesion with protruding hair, a trial of conservative treatment may be attempted. However, the patient should accept the risk of developing an abscess on every stage of treatment. Conservative treatment is only possible for non- infected pilonidal cysts.<sup>3</sup> Every abscess requires surgical intervention. Conservative methods used in the past, such as phenol injection, cryosurgery, thermal destruction, local radiation, are no longer recommended due to high rate of complications and patient's discomfort. While applying conservative methods, it should be remembered to remove all hairs from the pilonidal sinus accessible through the skin opening.<sup>4</sup>

One of conservative methods is application of fibrin glue for cyst closure. This method may only be used in patients with early lesions, with no history of abscesses, who have never underwent surgical treatment and have only one opening of the pilonidal sinus.<sup>5</sup>

A fundamental principle of surgical treatment is total resection of the lesion, including its lateral channels, up to fascia of sacrum. Application of dye to the external opening makes it easier to identify lateral channels of the cyst.<sup>6</sup>

The most commonly used method is simple excision of pilonidal cyst. Primary wound closure shortens healing

time, however, it is associated with an increased complication rate, including infection and dehiscence, and recurrence of the disease as a result. Leaving the wound 'open' to heal requires longer convalescence time, but also with lower rate of recurrence. Relocation of flaps should be reserved for patients with extensive chronic lesions. In the case of less extensive pilonidal cysts, deep incisions with mobilization of subcutaneous tissue allows for faster healing and is more acceptable by patients than flap surgery.<sup>7</sup>

Time spent off work and perceived recurrence rates and methods which includes the laying open the all tracks with or without marsupialization, the excision of all tracks with or without primary closure and the excision of all tracks and then closure by some other means designed to avoid a midline wound (Limberg procedure, Z-plasty, Karydakis procedure) but it is usually surgeon preference, which influence the choice of method.<sup>8</sup>

### **Material and methods**

This prospective comparative study was conducted on 75 cases of symptomatic or recurrent pilonidal sinuses admitted to surgical wards of J.L.N. Medical College & Associated Hospitals, Ajmer from July 2017 to July 2019.

### **Selection of patients**

1. Patients from all age groups and either sex had taken into consideration.
2. Only symptomatic patients, having either pain, abscess formation, sinuses and discharge was included.

All patients were randomly divided in three groups of 25 patients each. First group underwent wide excision with Limberg rhomboid flap, second group patient was underwent other surgical procedures like wide excision

with laying open and third group compared those with wide excision with primary midline closure.

All patients was enquired about any significant history regarding the predisposing factors like occupation, life style, family history etc and thorough general physical examination was done. Detailed examination of sinuses was done to know its location, extent, infection and any discharge. Further investigations like sinogram, MRI was done in complicated cases, as and when required.

Post operatively the patient was put on liquid diet and i.v. antibiotics for the initial 5 days in order to discourage the bowel movements.

Follow up was done on day fourteen and day twenty-one. Then monthly for three months.

Data was analysed as per the days of hospitalization, days of healing, work off periods, number of days pain persisted post operatively, complications and recurrences.

**Results**

Table1: Age Wise Distribution of Pilonidal Disease

Age (Yrs)	Grand Total
<10	0
11-20	15(20%)
21-30	43(57.3%)
31-40	11(1.7%)
>40	6(8%)
Total	75

Mean age = 27.2 years.

The most common age of presentation in the age group 21-30 years.

The youngest patient was 17 years and the oldest was 70 years of age. There was no case reported below 10 year age group and very few, about 8% above 40 years.

Table 2: The Incidence of Pilonidal Disease In Both Sexes

Sex	Grand total
Male	72(96%)
Female	3(4%)
Total	75

In our study the incidence of pilonidal disease is more common in men (96%) as compare to female (4%).

Table 3: Clinical Presentation In Patients With Pilonidal Disease

Clinical Presentation	No. of Patients
Midline swelling with multiple pus discharge sinuses	32(42.7%)
Midline swelling with a single pus discharge sinus	25(33.3%)
Small pus discharge sinus without swelling	18(24%)
Total	75

In our study the commonest clinical presentation was midline swelling with multiple pus discharge sinuses (42.7%) followed by midline swelling with a single pus discharge sinus (33.3%) and rest of 24% had Small pus discharge sinus without swelling.

Table 4: Days of Hospitalisation In Patients With Pilonidal Disease Operated By Different Procedures

Surgical procedure	N	Mean (days)	Std. Deviation (days)	95% confidence interval for mean		Test of significance (ANOVA)	
				Lower bound	Upper bound	P value	Significance
Limberg's rhomboid flap	25	6.8400	1.51877	6.2131	7.4669	<0.001	Highly Significant
Excision & Laying open	25	12.9600	1.33791	12.4077	13.5123		
Excision & Primary midline closure	25	8.0800	2.97097	6.8536	9.3064		
Total	75	9.2933	3.35621	8.5211	10.0655		

The mean days of hospitalization in Limberg's rhomboid flap was 6.8±1.5 days, for primary closure it was 8.08±2.9 days and for laying open

technique it is 12.96±1.3 days. P-value <0.001 (Highly significant).

Table 5: wound healing in patient with pilonidal disease operated by different procedures

Surgical Procedure	N	Mean (days)	Std. Deviation (days)	95% confidence interval for mean		Test of significance (ANOVA)	
				Lower bound	Upper bound	P value	Significance
Limberg's rhomboid flap	25	16.6800	5.04414	14.7979	18.9621	<0.001	Highly Significant
Excision & Laying open	25	49.5600	7.80534	46.3381	52.7819		
Excision & Primary midline closure	25	20.0400	9.21557	16.6760	24.2804		
Total	75	28.7600	13.89242	25.9353	32.0093		

The mean days of wound healing in Limberg's rhomboid flap are 16.6±5 days, for primary closure

it is 20±9.2 days and for laying open technique it is 49.5±7.8 days. P- value - <0.001 (highly significant)

Table 6: Work off Periods In Patients With Pilonidal Disease Operated By Different Procedure

Surgical procedure	N	Mean (days)	Std. Deviation (days)	95% confidence interval for mean		Test of significance	
				Lower bound	Upper bound	P value	Significance
Limberg's rhomboid flap	25	19.6400	5.13971	17.0784	21.3216	<0.001	Highly Significant
Excision & Laying open	25	52.6800	8.00375	49.3762	55.9838		
Excision & Primary midline closure	25	23.6600	9.34559	19.5823	27.2977		
Total	75	31.9933	13.94123	28.6789	34.8677		

The mean work off periods in Limberg's rhomboid flap are 19.64±5.1 days, for primary closure it is

23.66±9.3 days and for laying open technique it is 52.6±8 days. P- value - 0.001 (highly significant)

Table 7: Complication In Patients With Pilonidal Disease Operated By Different Procedure

Procedure/ Complication	Wide excision with Limberg's rhomboid flap	Wide excision with laying open	Wide excision with primary closure	P value	Significance
Seroma	01(4%)	-	06(24%)	0.008	S
Hematoma	-	-	04(16%)	0.01	S
Necrosis	2(4%)	-	06(24%)	<0.001	HS
Infection	02(8%)	07(28%)	04(16%)	0.146	NS
Wound Dehiscence	01(4%)	-	05(20%)	0.02	S
Loss of sensation	4(16%)	04(16%)	03(12%)	<0.001	HS

S= Significant

NS= Not significant

HS=Highly Significant

The most common complication with Limberg's rhomboid flap is loss of local sensation in 16% of cases while tip necrosis was present in 4% cases. Infection,

seroma formation and wound dehiscence developed in 8%, 4% and 4% cases respectively.

The most common complication with laying open procedure was infection in 28% cases followed by loss of sensation in 16% cases.

Necrosis and seroma formation were the most common complication with primary closure technique occurred in 24% of the cases. Wound dehiscence developed in 20% cases. Hematoma, infection and loss of sensation developed in 16%, 16% and 12% respectively.

### Discussion

Pilonidal Sinus Disease has become a common disease 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.

In present study, pilonidal sinus disease is an acquired condition usually seen in young adults of 21 to 30 years of age (57.3%). The same has been observed by Z.S. Matar<sup>9</sup> (15 to 32 years) and M.R.B. Keighley<sup>10</sup> (peak age incidence is 15 to 24 years). This higher occurrence in the 3rd decade of life is because pilonidal disease starts at the onset of puberty, when sex hormones start acting on pilosebaceous glands in the natal cleft. A hair follicle becomes distended with keratin and subsequently infected, leading to a folliculitis and an abscess which extends into the subcutaneous fat.

The disease is more common in males for reasons like hirsutism, distribution of hair and occupation. The western literature also confirms that this disease is predominant in males. Similar to our study, Chintapatla et al.<sup>11</sup> showed male preponderance of this disease. This may be mainly due to their more hirsute nature.

In present study majority of our patient were having a coarse body hair density (88%), deep natal cleft (89%) and a sedentary lifestyle (100%). Most of the patients presented with a midline swelling with multiple pus discharging sinuses (42.7%) involving the upper midline of the natal cleft (78.7%). We found that, patients with a deep natal cleft and coarse body hair density are more susceptible to pilonidal disease (88% Vs. 12%) and on further correlation with natal cleft it was found that more than three fourth of these patients (78.87%) were having deep natal cleft. With this data we can derive that the disease is common in patients with coarse hair density and deeper natal cleft. Thus; deep natal cleft is an important factor in the causation of pilonidal sinus.

Mohamed MS et al (2006)<sup>12</sup> in accordance with above observations reported 56.3% of patients were having a coarse hair density, with deep natal cleft and, about three fourth of these were commonly involving uppermid and side walls in the cleft. The results were again comparable.

We are also in full agreement of the above author as we found that patients with recurrent disease were all males having a coarse body hair density and deeper natal cleft.

Hospitalization, wound healing and work off periods are relative measures of outcome. They are strongly related to personal, sociocultural, socioeconomic levels, type of job, social assurance and behavioural patterns within these aspects, in our study. We observed shorter hospitalization periods in patients who underwent primary closure by Limberg rhomboid flap (6.8±1.5 days), the longest days of hospitalization (12.96±1.3 days) were detected in wide excision with laying open technique while in midline closure technique it was (8.08 ± 2.9 days).

Irpargire RN et al (2016)<sup>13</sup> found the mean duration of postoperative stay in the hospital was 3.4 days in patients without complications. Hospital stay was increased to average 6.5 days in patients who had some complications.

All studies done so far including the study done by M.Kamil Yildiz et al.<sup>14</sup> show that the duration of hospital stay in patients treated with flap procedures are very less compared to patients who underwent other procedures. Our study also confirms the same findings

The total time taken for the wound/flap to heal was noted to be significantly lower in patients undergoing Limberg flap procedure. This correlates with studies that prove that the average time taken for wide excision wound to heal is about 53.46±4.96 days in the present study while in the study by Akmal Jamal et al.<sup>15</sup> it was 120.08±31.59 days. In patients undergoing karydaki's, the healing time notes in study by Bali et al.<sup>16</sup> was a 24.08±6.59 day while in the present study it is notes to be 22.3±3.30 days. In patients undergoing Limberg flap procedure, the healing time noted in the present study is 19.64±5.1 days. While in the study by Akmal Jamal et al.<sup>15</sup> it was noted to be 20.13±8.99 days

### Conclusion

The ideal procedure for treating pilonidal sinus disease is not clear, but complete excision of the affected areas, flattening of the natal cleft, avoiding midline scars, and a tension free repair of the wound with well vascularized tissue appear to be essential features of any treatment for this disease. It is now clearly showed better patients' satisfaction with wound closure primarily or using flaps after surgery rather than leaving it open. For simple nonrecurrent pilonidal sinus, less invasive surgery with limited excision and primary closure could be enough. Different flap techniques showed no significant difference among

each other. However, the advantages of Karydak's cleft lift flap in recurrent and complicated cases are noticeable in different studies, although wound complication is similar to other flap methods. In conclusion, despite a longer operating time, rhomboid excision and Limberg flap closure, with its low complication rate and acceptable long-term results, is preferable to simple excision and primary closure in the treatment of SPD.

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