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ORIGINAL ARTICLE

Compare the outcome of simple excision with primary closure versus rhomboid excision with limberg flap for sacrococcygeal pilonidal sinus

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ABSTRACT

Background: Sacrococcygeal pilonidal sinus is a common condition usually affecting young-to-middle-aged men. For managing sacrococcygeal pilonidal illness, a variety of lateralizing surgical flap procedures based on this principle have been published, including the Karydakis flap, Limberg flap, modified Limberg flap, Z-plasty, and Y-V advancement flap.
Aim: To compare the outcome of simple excision with primary closure versus rhomboid excision with limberg flap for sacrococcygeal pilonidal sinus.
Methodology: Randomized control study conducted in Surgery Department, Ghurki Trust Hospital, Lahore. 90 patients fulfilling the inclusion criteria were selected from wards and were randomly divided in two equal groups. In group A, patients underwent rhomboid excision with limberg flap. In group B, patients underwent simple excision with primary closure. The operation was performed under spinal anesthesia. After surgery, patients were evaluated every 24 hours if they are able to move on their own then they were discharged and hospital stay was noted. Then after 10 days, patients will be called in OPD for assessment of wound healing. If wound did heal and patient complained of pain (VAS>4) and cannot sit and have fever (temp>100^{o}F)
Results: The average age in group A was 44.37±15.42 years while that in group B was 45.24±14.50 years. In group A there were 23(51.1%) males and 22 (48.9%) females whereas in group B there were 25(55.6%) males and 20(44.4%) females. There was difference significant in the mean stay in hospital in both groups (p-value=0.002).
Conclusion: The conclusion of the study, that primary sacrococcygeal pilonidal sinus disease and rhomboid excision with Limberg's flap is an effective treatment.
Keywords: Simple Excision with Primary Closure, Rhomboid Excision, Limberg Flap, Sacrococcygeal Pilonidal Sinus

INTRODUCTION

Sacrococcygeal pilonidal sinus is a common condition usually affecting young-to-middle-aged men. Its pathophysiology is uncertain as it has been commonly thought to be embryonic; however, nowadays it is commonly thought to be acquired. Pilonidal sinus is due to hair penetration into the skin of the gluteal cleft that causes a cyst and sinus formation because of reaction to a foreign object, resulting in secondary infections and abscess formation. Risk factors include adiposity, sedentary lifestyle, local irritation-trauma, insufficient body hygiene, excessive hair, and perspiration[1].

Sacrococcygeal pilonidal disease is a common and frustrating problem, but there is still no consensus on the optimal treatment[2]. While many surgical and nonsurgical methods have been described for pilonidal disease, because of the high complication and recurrence rates, an optimal treatment has yet to be found. For managing sacrococcygeal pilonidal illness, a variety of lateralizing surgical flap procedures based on this principle have been published, including the Karydakis flap, Limberg flap, modified Limberg flap, Z-plasty, and Y-V advancement flap[3].

Rhomboid excision and Limberg flap closure have been found to have a low complication risk when used to treat primary or recurrent pilonidal sinus, small stay in hospital, returning to normal activity in a short period of time, as well as positive long-term outcomes[4].

One trial found that wound infection was 6.6% with rhomboid excision with Limberg flap and 26.6% with simple excision with primary closure for sacrococcygeal pilonidal sinus ($p<0.05$) and mean hospital stay was 1.63±0.67 days with rhomboid excision with Limberg flap and 2.8±1.24 days with simple excision with primary closure ($p<0.05$).(5) While another trial found that wound infection was 6.7% with rhomboid excision with Limberg flap and 20% with simple excision with primary closure for sacrococcygeal pilonidal sinus ($p=0.04$) but mean hospital stay was 2.82±1.36days with rhomboid excision with Limberg flap and 3.26±0.32days with simple excision with primary closure ($p > 0.05$)[6].

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The rationale of the study, to compare the outcome of simple excision with primary closure vs rhomboid excision with Limberg flap for sacrococcygeal pilonidal sinus. It has been observed through literature that rhomboid excision with Limberg flap is more effective in early healing and discharge from hospital than simple excision with primary closure. Moreover, very few literature is available which compared both these techniques. So, to get local evidence and applicability of rhomboid excision with Limberg flap in local setting, we want to conduct this study.

METHODOLOGY

This descriptive crosses sectional study was conducted from 17 September 2018 to 17 March 2019 in Nephrology Department, Shifa International Hospital. It was done with the permission of the hospital's review board. Informed written consent were obtained. 367 sample size was calculated with 95% confidence interval, 80% power of study and taking expecting anticipated population proportion 3.97%. Patients present with age 20-70yeras undergoing elective surgery for sacrococcygeal pilonidal sinus under spinal anesthesia were included. Patients with Diabetes mellitus (BSR>186mg/dl), hypertension (BP≥140/90mmHg), renal disease (creatinine>1.2mg/dl), liver disease (AST & ALT>40IU, Hepatitis B, C and cirrhosis) were excluded.

The demographic information like name, age, sex, BMI, lifestyle (>8 hours sitting), duration of sacrococcygeal pilonidal sinus was obtained. Then patients were randomly divided in two equal groups by using lottery method. In group A, patients underwent rhomboid excision with Limberg flap. In group B, patients underwent simple excision with primary closure. All patients underwent surgery by a single surgical team with assistance of researcher. The operation was performed under spinal anesthesia. Patients were evaluated every 24 hours if they are able to move on their own then they were discharged and hospital stay was noted. Patients were advised to present in OPD after 10 days of surgery for assessment of wound healing. If wound did heal and patient complained of pain (VAS>4) and cannot sit and have fever (temp>100^{o}F) and there was presence of pus discharge, redness at wound site, then wound infection. All the data was collected through a proforma.

Data was analyzed in SPSS 25 version. Quantitative data like Age, duration of pilonidal sinus, BMI and hospital stay was expressed as mean & SD. Qualitative data like gender, lifestyle & wound infection were expressed as percentage or frequency. Both groups were compared for average hospital stay by using independent samples t - test and for frequency of wound infection by using chi - square test. Stratified data like gender, age, BMI, lifestyle & pilonidal sinus duration. Post-stratification, both groups was compared for mean hospital stay by using independent samples t-test and for frequency of wound infection by using chi-square test. P - value ≤ 0.05 was considered as significant.

RESULTS

The patient mean age in group A was 44.37±15.42 years the minimum age was 20 years and maximum was 70 years while in group B the mean age of the patients was 45.24±14.50 years the minimum age was 20 years and maximum was 68 years. In group A there were 23(51.1%) males and 22 (48.9%) females whereas in group B there were 25(55.6%) males and 20(44.4%) females (Table 1).

Table 1: Descriptive statistics of age, Gender

	Group A	Group B
Mean±SD	44.37±15.42	45.24±14.50
Male	23(51.1%)	25(55.6%)
Female	22(48.9%)	20(44.4%)

In Group A there were 19(42.2%) patients with normal BMI, 12(26.7%) were overweight and 14(31.1%) were obese on the other side in group B there were 14(31.1%) patients with normal BMI, 20(44.4%) were overweight and 11(24.4%) were obese. In group A there were 26 (57.8%) patients with more than 8 hours of sitting and 19(42.2%) without more than 8 hours sitting while in group B there were 28(62.2%) patients with more than 8 hours of sitting and 17(37.7%) patients were not having more than 8 hours of sitting (Table 2).

Table 2: Frequency distribution of BMI and Life styles

	Group A	Group B
BMI		
Normal	19(42.2%)	14(31.1%)
Overweight	12(26.7%)	20(44.4%)
Obese	14(31.1%)	11(24.4%)
Life styles (> 8 hours sitting)		
Yes	26(57.8%)	28(62.2%)
No	19(42.2%)	17(37.8%)

The average duration of disease in group A was 22.40±4.70, whereas in group B was 21.80±4.88. The average hospital stay in group A was 2.57±0.49 days and group B was 3.00±0.70 days. There was significant difference in the mean values of hospital stay in study groups (p-value 0.002) (Table 3).

Table 3: Frequency distribution of duration of disease and hospital stay

		Group A	Group B
Duration of Disease	Mean±SD	2.57±9.49	3.00±0.70
Hospital Stay	Mean±SD	22.40±4.70	21.80±4.88

P velue 0.002

Table 4:Distribution of Wound Infection & Hospital stay in treatment groups in relation to age

	Group A	Group B	P value
Wound infection			
Yes	4(8.9%)	11(24.4%)	0.048
No	41(91.1%)	34(75.6%)	
Hospital stay in treatment groups in relation to age			
20-30	2.50±0.52	2.75±0.88	0.467
31-40	2.42±0.53	2.87±0.83	0.247
41-50	2.50±0.52	3.10±0.56	0.025
> 50	2.72±0.46	3.10±0.65	0.049

There were more patients with wound infection in group B and there was significant association between wound infection and study groups (p-value: 0.048). In the age group of 20-30 years, 31-40 years there was no significant difference in the mean values of hospital stay in treatment groups (p-values; 0.46 and 0.24 respectively) while in the age groups of 41-50 years and more than 50 years there was significant association between hospital stay and treatment groups (p-values: 0.025 and 0.049) (Table 4).

Table 5

	Group A	Group B	P value
Gender			
Male	2.60±0.49	3.04±0.67	0.016
Female	2.54±0.50	2.95±0.75	0.048
Hospital stay in treatment groups in relation to age			
20-30	2.50±0.52	2.75±0.88	0.467
31-40	2.42±0.53	2.87±0.83	0.247
41-50	2.50±0.52	3.10±0.56	0.025
> 50	2.72±0.46	3.10±0.65	0.049
BMI			
Normal	2.57±0.50	2.85±0.77	0.220
Overweight	2.58±0.51	3.10±0.64	0.025
Obese	2.57±0.51	3.00±0.77	0.110
Life style(>8hours sitting)			
Yes	2.65±0.48	2.89±0.73	0.169
No	2.47±0.51	3.17±0.63	0.001
Duration of Disease			
15-20	2.26±0.45	3.00±0.74	0.001
21-25	2.75±0.45	3.07±0.75	0.209
26-30	2.85±0.36	2.92±0.64	0.742

Table 6: Wound Infection in treatment groups in relation to Gender & age groups

	Wound Infection	Group A	Group B	P value
Male	Yes	1	2	0.602
	No	22	23	
Female	Yes	3	9	0.025
	No	19	11	
20-30 years	Yes	0	0	
	No	10	8	
31-40 years	Yes	0	3	0.070
	No	7	5	
41-50	Yes	0	2	0.136
	No	10	8	
>50	Yes	4	6	0.522
	No	14	13	

Table: 7 Wound Infection in treatment groups in relation to BMI and Life Style

	Wound Infection	Group A	Group b	P value
Life style				
Yes	Yes	3	7	0.203
	No	23	21	
No	Yes	1	4	0.114
	No	18	13	
BMI				
Normal	Yes	1	5	0.025
	No	18	9	
Over-weight	Yes	1	4	0.379
	No	11	16	
Obese	Yes	2	2	0.792
	No	12	9	

The difference was significant in the mean values of hospital stay in treatment group among both males and females and also no significant difference in the mean values of hospital stay and treatment groups among normal and obese BMI patients (p-values:< 0.05), while there was significant association between hospital stay and treatment groups among overweight patients (p-value: 0.025). The difference was significant in the mean values of hospital stay in the treatment groups among the patients with not more than 8 hours of sitting (p-values: 0.169 and 0.001 respectively). The mean values of hospital stay in both groups as shown in Table 5.

There was no significant association between wound infection and treatment groups among males whereas there was significant association between wound infection and treatment groups among females (p-values: 0.602 and 0.025). There were no patients with wound infection in the age group of 20-30 years in group A and B and there was insignificant association between wound infection & treatment groups in the age groups of 31-40

years, 41-50 years and more than 50 years (p-values: 0.070, 0.136 and 0.522 respectively). Table: 6 Wound infection in treatment groups in relation to BMI and life style as shown in Table 7

DISCUSSION

Sacrococcygeal pilonidal disease is common, a disabling disorder that primarily affects young working student populations, causing significant morbidity and lost work days[7]. The symptom complex of the pilonidal sinus includes everything from asymptomatic pits to severe draining lesions[8].

Because the natal cleft is still there, Simple excisional methods are linked with a high rate of morbidity recurrence due to existence of natal cleft. Following excision & initial closure, recurrence rates of 7-42% have been documented[9] which according to the study by Shabbir et al 2014 was 13.0% whereas 0-5% recurrence have been reported in previous literature after Rhomboid excision & Limberg's flap closure that was around 3.10% in another research[5].

In previous studies, demographic data revealed in both groups that most of the patients were men, with average ages of 27 & 29 years, which was similar of many other study[5,10,11]. In our study, in group A, the mean age was 44.37±15.42 years while in group B the mean age was 45.24±14.50 years. In group A there were 23(51.1%) males and 22(48.9%) females whereas in group B there were 25(55.6%) males and 20(44.4%) females.

For pilonidal illness, researchers found that flap re-construction was better to excision & main closure, or that the improved Limberg's flap were greater in terms of recurrence & wound infection[4]. According to Jabbar 2018 (12) mostly patients were young with the average age of 27.8±5.97 years whereas in our study the average age of the patients was higher in both the groups in Limberg Flap group the mean age of the patients was 44.37±15.42 years and in primary closure group it was 45.24±14.50 years.

In 2020 study, there was difference significant between both the procedures Excision with closure and limber flap as presented in results with reference to wound infection (p=0.02)[13] while in our study there was association between wound infection and treatment groups (p-value: 0.048).

Another to Jabbar et al, There was no difference significant between both procedures as presented in results with reference to wound infection (p=1.20) while in our study there was association between wound infection and treatment groups (p-value: 0.048). 20% wound infection in Open Procedure &16.66% in Limberg Flap method while in our study there were 8.9% patients with wound infection in Limberg`s Flap group and 24.4% in primary closure group[12].

According to Shabbir et al[5]. Post-operative rate of infection was four times greater after closure similar are the findings of our study as in our study the wound infection rate was higher in 3 times in primary closure group. One study reported at 100 patients who were of the same age and gender, while contrasting the two methods, that quality of life better by smaller stay in hospital, work time reduced, complication rates are lower, modified Limberg's flap during pilonidal operation had two advantages: reduced pain perception and enhanced overall health[14].

Obesity is linked to recurrence and complications, as obese individuals with a BMI more than 35 had longer drain output & stay in hospital, and more complications as compare to non-obese patients[15].

A study found that Modified Limberg's flap patients stayed in the hospital for 1 to 2 days; another study found that the average stay in hospital was 7.9 days, whereas according to the findings of our study the mean hospital stay in Limberg's flap group was 2.57 days which is almost similar to the above mentioned study. In our study, the average hospital stay in the primary closure group was 3 days, but in another study, the average stay in hospital was 3.2±0.31 days. Though comparing both techniques, In our study, the mean stay in hospital for the Limberg's Flap group was 2.57 days, whereas the primary closure group was 4.8 days, which is longer than the one reported in another study[16]. According to Shabbir et al[5] the mean stay in hospital was 1.60±0.66 days for Limberg's flap & 2.81±1.23 days for primary closure that is low significantly as compare with our study[17].

CONCLUSION

The conclusion of the study, that may be stated that Rhomboid excision with Limberg's flap is an excellent treatment for primary sacrococcygeal pilonidal sinus illness, with a minimal wound infection rate, a short stay in hospital, patient satisfaction, and favorable long-term results.

Conflict of interest: Nil

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