

Comparison of Early Outcome between Modified Limberg and Karydakias Flap Procedures in Patients with Sacrococcygeal Pilonidal Sinus

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ABSTRACT

Background: Sacrococcygeal pilonidal sinus is a common surgical problem primarily affecting men between puberty and early thirties. It manifests as a chronic infection of the skin in the region of the buttock crease. Though uncommon, pilonidal disease can involve other parts of the body as well, such as the clefts between the fingers of barbers or hairdressers. The results of this study will help in better management of such patients in future practice.

Aim: To repeat this trial to determine the better treatment option between Limberg flap and Karydakias flap procedures in patients with sacrococcygeal pilonidal sinus disease.

Study design: Randomized Controlled Trial.

Settings: Department of General Surgery, Unit-II, Sir Ganga Ram Hospital, Lahore.

Duration of study: 19th October 2015 to 19th April 2016

Methods: Sample size of 180 cases (90 in each group) is calculated with 80% power of test and 95% confidence level while taking expected percentage of seroma formation to be 4.2% with modified Limberg flap and 17.1% with modified Karydakias flap procedure in patients with sacrococcygeal pilonidal sinus.

Results: In this study total 180 cases were enrolled, 90 were from group A and 90 were from group. The mean age of the patients in group A was 42.71±14.78 years and in group B its mean value was 43.42±16.66 years. 117(65%) patients were male and 63(35%) patients were females. The male to female ratio of the patients was 1.8:1.

Conclusion: In early outcome the modified Limberg procedure showed significantly less wound infection and seroma formation than Karydakias flap procedure with sacrococcygeal pilonidal sinus.

Keywords: Limberg flap, Kardakis flap, pilonidal sinus,

INTRODUCTION

Previous research has identified male gender, obesity, sports or occupation requiring sitting, excessive body hair, poor body hygiene and excessive sweating as the primary risk factors^{1,2}.

The treatment of the disease is mainly surgical with diversity of procedures ranging from wide excision, excision with midline closure, oblique excision and asymmetric closure to flap procedures such as Karydakias and Limberg flap procedures².

Previous research has shown that flap procedures are superior to traditional methods.^{3,4} But debate still exists regarding the better option among various flap procedures particularly the Karydakias and Limberg flap procedures^{2,3,4}.

Karaca et al. in 2012 reported that Limberg flap procedure was associated with significantly lower frequency of post-operative seroma formation (4.2%

vs. 17.1%; $p=.04$) as compared to Karydakias flap procedure in patients with sacrococcygeal pilonidal sinus disease⁵. Ersoy et al. in 2009 reported decreased frequency of wound infection with Limberg flap procedure (8% vs. 26%; $p<0.05$) as compared to Karydakias flap procedure⁶.

Limberg Flap procedure thus appears better than Karydakias flap procedure in terms of frequency of post-operative wound infection and seroma formation. The observation of above mentioned studies advocates Limberg flap over Karydakias flap in the treatment of sacrococcygeal pilonidal sinus disease^{5,6}.

However, Limberg flap is associated with a larger post-operative scar and is technically more demanding procedure as compared to Karydakias flap procedure⁵. Furthermore, before concluding and adopting Limberg flap in routine practice, it is worth mentioning that in a recent study by Bessa (2013) there was no significant difference between Karydakias flap and Limberg flap in terms of wound infection (3% vs 5%; $p>0.99$) and seroma formation (5% vs 0%; $p=0.24$)⁷.

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A possible explanation for this conflict can be difference in surgical technique among various researchers. To the best of candidate's knowledge, there is no local published study on this topic. Owing to lack of local research and the conflict among existing international literature^{5,6,7}, the purpose of the current study is to repeat this trial to determine the better treatment option between Limberg flap and Karydakis flap procedures in patients with sacrococcygeal pilonidal sinus disease. The results of this study will help in better management of such patients in future practice.

MATERIAL AND METHODS

It's a Randomized Controlled Trial conducted in the Department of General Surgery, Unit-II, Sir Ganga Ram Hospital, Lahore during 6 months from 19th October 2015 to 19th April 2016. Sample size of 180 cases (90 in each group) is calculated with 80% power of test and 95% confidence level while taking expected percentage of seroma formation to be 4.2% with modified Limberg flap and 17.1% with modified Karydakis flap procedure in patients with sacrococcygeal pilonidal sinus. Sampling technique was non probability, Consecutive sampling.

Inclusion criteria

1. Patients of both genders, aged between 18-70 years, having sacrococcygeal pilonidal sinus disease (as per operational definition) for ≤ 1 year.
2. Patients who give written informed consent to participate in this study.

Exclusion criteria

1. Patients with diabetes (fasting blood sugar ≥ 110 mg/dl), anaemia (Hb ≤ 10 g/dl) and steroid therapy (history and clinical record).
2. Patients with concomitant other disorder like perianal fissure (breach in the continuity of perianal skin)/ sinus (discharging opening in the perianal area)/ abscess (red, hot and tender collection in the perianal area) on clinical examination.
3. Patient with recurrent sacrococcygeal pilonidal sinus disease (history of previous surgery from the patient)

Data Collection Procedure: 180 Patients presenting in the outpatient department of Surgical Unit-II, Sir Ganga Ram Hospital, Lahore who meet the inclusion criteria was enrolled into this study. Written informed consent and detailed history was taken from every patient. The patients were randomly divided into two treatment groups using lottery method as follows. Group A=Modified Limberg Flap Procedure (n=90) Group B=Modified Karydakis Flap Procedure (n=90)

Data analysis procedure: All the collected data was entered into SPSS version 20. Numerical variables; age was presented by mean \pm SD. Categorical variables i.e. gender, wound infection and seroma formation was presented by frequency and percentage. Chi-Square test was applied for comparison of frequency of wound infection and seroma formation between the two groups taking p value ≤ 0.05 as significant. Data was stratified for age and gender to address effect modifiers. Post stratification chi-square test was applied taking p-value ≤ 0.05 as significant.

RESULTS

In this present study total 180 cases were enrolled, 90 were from group A and 90 were from group. The mean age of the patients in group A was 42.71 ± 14.78 years and in group B its mean value was 43.42 ± 16.66 years.

In our study 117(65%) patients were male and 63(35%) patients were females. The male to female ratio of the patients was 1.8:1.

In this study 117 cases were male in which 53 were from group A and 64 were from group B, similarly the female patients were 63 in which 37 were from group A and 26 were from group B.

The study results showed that the wound infection was observed in 41(22.8%) patients and it was not observed in 139(77.2%) patients (Table 1).

In our study the seroma formation was observed in 26(14.44%) patients and it was not observed in 154(85.56%) patients (Fig.1).

In this study the wound infection was found in 41 cases in which 11 were from group A and 30 were from group B, similarly the wound infection was not found in 139 cases in which 79 were from group A and 60 were from group B. Statistically significant difference was found between the study groups with wound infection i.e., p-value=0.001 (Table 2).

In this study the seroma formation was found in 26 cases in which 6 were from group A and 20 were from group B, similarly the seroma formation was not found in 154 cases in which 84 were from group A and 70 were from group B. Statistically significant difference was found between the study groups with seroma formation i.e., p-value=0.003 (Table 3).

The study results showed that in below 45 years patients, the wound infection was found in 22 cases in which 5 were from group A and 17 were from group B. Similarly in above 45 years patients, the wound infection was found in 19 cases in which 6 were from group A and 13 were from group B. Statistically significant difference was found between the study groups with wound infection in below 45 years patients i.e., p-value=0.002.

The study results showed that in below 45 years patients, the seroma formation was found in 13 cases in which 4 were from group A and 9 were from group B. Similarly in above 45 years patients, the seroma formation was found in 13 cases in which 2 were from group A and 11 were from group B. Statistically significant difference was found between the study groups with seroma formation in above 45 years patients. i. e p-value=0.015.

The study results showed that in male patients, the wound infection was found in 29 cases in which 8 were from group A and 21 were from group B. Similarly in female patients, the wound infection was found in 12 cases in which 3 were from group A and 9 were from group B. Statistically significant difference was found between the study groups with wound infection stratified by gender i.e., p-value=0.02 & 0.008 respectively.

The study results showed that in male patients, the seroma formation was found in 24 cases in which 5 were from group A and 19 were from group B. Similarly in female patients, the seroma formation was found in 2 cases in which 1 was from group A and 1 was from group B. Statistically significant difference was found between the study groups with seroma formation in male patients i.e., p-value=0.010.

Fig. 1: Frequency distribution of seroma formation

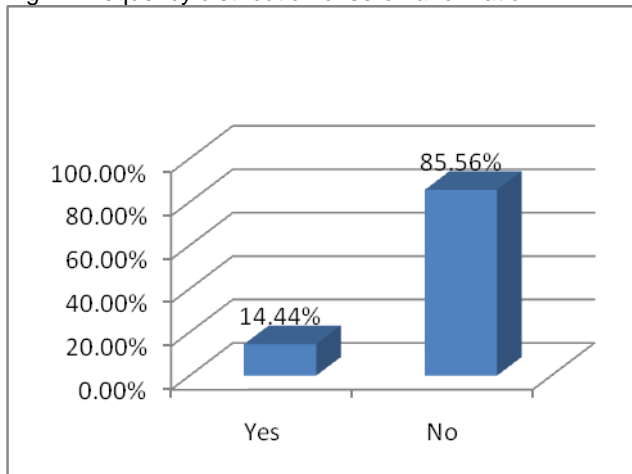


Table 1: Frequency distribution of wound infection

Wound infection	Frequency	Percent
Yes	41	22.8
No	139	77.2

Table 2: Comparison of wound infection with study groups

Wound infection	Study Groups		Total
	Group A	Group B	
Yes	11	30	41
No	79	60	139

Chi value=11.402 p-value=0.001 (Significant)

Table 3: Comparison of seroma formation with study group

Seroma formation	Study Group		Total
	Group A	Group B	
Yes	6	20	26
No	84	70	154

Chi value=8.81

p-value=0.003(Significant)

DISCUSSION

Pilonidal sinus was first described by Anderson in 1847 and is often seen in the intergluteal region. This chronic disease is characterized by acute exacerbations^{9,11,12}. The etiology and pathogenesis of PS is frequently associated with both congenital and acquired factors. It has been suggested that PS starts as a chronic process involving the accumulation of lifeless hairs and subcutaneous hair deposition in the intergluteal region that leads to inflammation and infection^{10 12 13}.

In our study total 180 cases were enrolled, 90 were from group A (MLF) and 90 were from group B (MKF). The wound infection was found in 41 cases in which 11 were from group A and 30 were from group B, the seroma formation was found in 26 cases in which 6 were from group A and 20 were from group B. Statistically MLF study groups showed significantly less wound infection and seroma formation as compared to MKF group patients. i. e p-value=0.001 & 0.003 respectively. Some of the studies are discussed below showing the results in favour of our study as.

A study by E. Ersoy et al⁶ resulted that there was a significantly higher wound infection rate in the Karydakias group than in the Limberg group (13/50 and 4/50 respectively). This also resulted in significantly higher values for wound dressings and need for analgesia. The time off work and off driving and also the Visual Analogue Scale scores were not significantly different between the two groups.

Another study by TurgutKaraca et al⁵ presented that A modified Karydakias flap reconstruction was carried out in 35(43.2%) of 81 patients and Modified Limberg flap reconstruction was carried out 46(56.8%) of 81 patients with pilonidal sinus disease. The difference between the groups for complication was statistically significant (P: 0.010). Two patients had seroma in MLF group and 6 patients in MKF group (4.2% and 17.1%/P: 0.048) and the difference was statistically significant. In MLF group there were no wound infection but in MKF group wound infection occurred in 2 patients (5.7%).

The incidence of wound infection was ranged from 0% to 12%^{8,9} and in MKF group and 0.8% to 12% in MLF group in the other studies⁸.

Quick healing time, short hospital stay, early return to daily life, low complication and recurrence

rate are the important advantages of the Limberg flap procedure.

A study by Mehmet Fatih Can et al showed that there were no significant differences between the two groups in terms of complication rate, length of stay, or recurrence rate. Patients in the Karydakís group reported feeling completely healed more quickly postoperatively. The two groups reported similar rates of satisfaction.

One study by Bessa and Samer S found insignificant differences were between study groups (MKF & MLF) regarding overall complication rate (23% vs 40%, $p = 0.08$), wound infection (3% vs 5%, $p > 0.99$), subcutaneous fluid collection (5% vs 0%, $p = 0.24$), or hypoesthesia (10% vs 23%, $p = 0.09$).

These results provide further evidence that wide excision with a Limberg transposition flap reconstruction is an effective surgical method for primary or recurrent pilonidal sinus, associated with a low complication rate, short hospitalization and disability, and a low recurrence rate shown by B. Bülent Montes et al in their study.

On the other hand study by Mustafa Ates et al concluded in their study that Karydakís flap procedure should be chosen instead of the Limberg flap for treating uncomplicated SPD because of its lower postoperative complication rate, lower pain scores, shorter operation time and length of hospital stay, and good cosmetic satisfaction. However, no differences existed between the 2 surgical procedures in terms of recurrence prevention.

in a recent study by Bessa (2013) there was no significant difference between Karydakís flap and Limberg flap in terms of wound infection (3% vs 5%; $p > 0.99$) and seroma formation (5% vs 0%; $p = 0.24$).⁷

CONCLUSION

This randomized control trial has proved that in early outcome the modified Limberg procedure showed significantly less wound infection and seroma formation than Karydakís flap procedure in patients with sacrococcygeal pilonidal sinus

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