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ORIGINAL ARTICLE

Comparison of outcome of Simple Excision vs Limberg Flap of pilonidal sinus in terms of post operative pain, operative time, wound infection and hospital stay.

Muhammad Aqeel[1], Ahmed Siddique Ammar[2], Muhammad Shoaib[3], Humaira Alam[4], Wajahat Amir[5], Abrar ul Hassan Pirzada[6]

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ABSTRACT… Objective: To compare post operative pain, wound infection, intraoperative time and length of hospital stay in both groups of simple excision and Limberg flap. **Study Design:** Comparative Prospective study. **Setting:** CMA Teaching and Research Hospital/Azra Naheed Medical and Dental College, Lahore, Pakistan. **Period:** 1st September 2021 to 1st September 2023. **Methods:** After approval from the Institutional review board of Azra Naheed Medical & Dental College/CMA Hospital, the sample was 120 patients was raised using non-convenience probability sampling divided into 2 groups. Group A patients underwent simple excision while Group B patients underwent Limberg flap Inclusion criteria include all the patients with age more than 13 years and diagnosed as case of pilonidal sinus. All the data was entered and processed by using SPSS 26. Comparison of two groups was done by apply independent sample t-test. A p-value of ≤ 0.05 was considered significant. **Results:** The average age of the patients was 45.88 ± 9.78 years with minimum and maximum ages were 15 & 59 year respectively. Mean post operative pain was 2.6 ± 1.9 in group A while 3.9 ± 2.7 in group B (p value = <0.05). Similarly wound infection, duration of surgery and length of hospital stay were also less in group A patients as compared to group B patients. **Conclusion:** Simple excision of pilonidal sinus is better from Limberg flap in terms of post operative pain, wound infection, duration of surgery and length of hospital stay.

Key words: Excision, Limberg Flap, Pilonidal Sinus, Pain, Visual Analogue Score, Wound Infection.

INTRODUCTION

Pilonidal disease also known as jeep button in a disease found in human beings in midline at sacrocoggygeal region. Pilonidal is a Latin word which is derived from two Latin words "Pilo" means hairs and "nidus" means nest.[1] The incidence of pilonidal sinus is about 26 in 100000 people and it is more commonly present in men as compared to women. This disease is most commonly found in people whose profession include long hours of sitting.[2] The pathophysiology of pilonidal sinus showed that it is and infective process which later makes a tract in the soft tissue. The most common area where pilonidal sinus occur is sacrococcygeal area but it can occur at many other areas for example axilla, umbilicus or any area with abundant hairs.[3]

There is no specific blood or imaging investigation necessary for diagnosis of pilonidal sinus and the diagnosis is usually clinical. Usually, patient present with a opening in the sacrococcygeal region through which discharge is coming out or causing pain. The openings which are also known as sinuses are single or multiple.[4] Inside this sinus there is a long tract either single or multiple which lie in same direction or in different directions. Treatment includes conservative methods and surgical methods. Conservative or medical management includes use of antibiotics, pain killers and anti-inflammatory drugs while surgical treatment included variety of procedures.[5] These include simple excision of tract, excision of tract and skin grafting, excision and Z plasty, karydakis excision, Limberg Flap or Rhomboid flap, Bascom procedure and others. The main aim in all surgeries is to shift the shift the midline away from the center.[6]

1. MBBS, FCPS, Assistant Professor General Surgery, Azra Naheed Medical College/CMA Hospital, Lahore.
2. MBBS, MS, FACS, CHPE, Assistant Professor General Surgery, Azra Naheed Medical College/CMA Hospital, Lahore.
3. MBBS, FCPS, Professor General Surgery, Azra Naheed Medical College/CMA Hospital, Lahore.
4. MBBS, FCPS, Associate Professor General Surgery, Azra Naheed Medical College/CMA Hospital, Lahore.
5. MBBS, FCPS, Assistant Professor General Surgery, Azra Naheed Medical College/CMA Hospital, Lahore.
6. MBBS, FCPS, Associate Professor Plastic Surgery, Azra Naheed Medical College/CMA Hospital, Lahore.

Correspondence Address:
Dr. Ahmed Siddique Ammar
Department of General Surgery
Azra Naheed Medical College/CMA Hospital, Lahore.
asammar1912@gmail.com

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Simple excision is used most commonly in single tract with goof results and less post operative pain. While on the other hand Limberg flap is little complex as compared to simple excision.[7] In a study done by Singh M et al, both simple excision and Limberg flaps have same rate of post operative infection and pain score but on the other hand few studies proved that simple excision is superior to Limberg flap in terms of postoperative pain and wound infection.[8-10]

In this study we compared post operative pain, wound infection, intraoperative time and length of hospital stay in both groups of simple excision and Limberg flap.

METHODS

This was a comparative study done at the department of general surgery of CMA teaching and research hospital, a tertiary care teaching hospital of Azra Naheed Medical and Dental College Lahore, Pakistan. It was a 2 years study started from 1st September 2021 to 30th august 2023.sample size of 120 patients was calculated for this study by using 90% power of test,5% level of significance with expected mean value of duration of surgery in simple excision patients as 30.1 ± 11.6 minutes and in patients with Limberg flap as 53.7 ± 17.9.[11] The formula used was n = Z2 1-α/2 {P1 (1 – P1) + P2 (1 – P2)} / d2. Where Z2 1-α/2 = confidence level 90% = 1.64, P1 = population proportion 1 = 30.1 ± 11.6 minutes and P2 = population proportion 2 = 53.7 ± 17.9 minutes and d = absolute precision = 5.

The approval of the study was taken from the Institutional review board (20-08-21) of Azra Naheed Medical College. The sample of 120 patients was raised by using non convenience probability sampling. All the patients were taken from outdoor surgery department of CMA Hospital Lahore. All patients who were included in the study were of age more than 13 years and all were diagnosed as case of pilonidal sinus by consultant who had experience of more than 3 years after post-graduation. The diagnosis of pilonidal sinus was made by the presence of sinus or follicle with epithelialization in the sacral area. Induration and swelling were palpable beneath the skin of the sinus associated with pain and purulent discharge from the sinus tract. Sinus openings can be single or multiple. On the other hand, all those patients were excluded from the study who were age less than 13 years, immunocompromised patients, patients with uncontrolled diabetes or any other infectious disease of sacrococcygeal area and patients unfit for surgery.

Basic demographic data of the patient like name, age and gender was noted and patients were divided into two random groups by lottery method. Each group contains equal number of patients i: e 60 patients. All patients in group a underwent simple excision while patients in group b underwent Limberg flap. The technique used for the excision of pilonidal sinus was described by Emile SH et al and the technique of Limberg flap was used as described by Calisir A et al.[13,14] Surgeries were performed by more than one consultant who had experience of more than 5 years after post graduation.

All the selected outcome were measured by multiple post graduate residents of surgery who were blinded about the group allocation of the patients. Surgery time was defined as the time in minutes from skin incision to skin closure after surgery. Post operative pain was observed in all patients in terms of visual analogue score (VAS) in which no pain has 0 number while severe pain has 10 points.[15]

This score was calculated approximately 24 hours after surgery. The parameters of declaring wound infection were appearance of reddens around wound margins or swelling around incision site with or without clear or purulent discharge from the wound, pain at operation site and pyrexia of 99 degree Celsius or above. Discharge criteria was not set and all patients were discharged from hospital if there were no complications after surgery. SPSS version 26 was used for entering and processing of data. Quantitative variables like age, operative time, mean hospital stay and pain score was calculated on a prescribed proforma by using mean ± SD. gender and wound

infection were described by using frequency and percentages. The values of both groups were analyzed by applying independent t test and p value of ≤ 0.05 was considered as significant.

RESULTS

The total sample size was 120 patients with each group containing 60 patients. The average age of the patients was 45.88 ± 9.78 years with minimum and maximum ages were 15 & 59 year respectively. All the patients included in this study were male. In group A the mean surgery time was 35.9 ± 11.7 minutes while in group B the mean surgery time of the patients was 55.1 ± 19.6 minutes. Statistically there is significantly less intra-operative time was found in group A as compared to group B. P-value= <0.001 (Table-I). the length of hospital stays and well as the mean post operative pain and rate of wound infection were significantly less in patients underwent simple excision as compared to patients who underwent Limberg flap as shown in Table-I.

	Study Groups		P-Value
	Group A (Simple Excision)	Group B (Limerg Flap)	
Mean Post Operative Pain (VAS)	2.6 ± 1.9	3.9 ± 2.7	<0.05
Wound Infection	4 (6.66%)	11 (18.33%)	0.01
Post Operative Hospital Stay (Days)	1.6 ± 1.3	3.2 ± 1.8	<0.05
Mean Operative Time (In Minutes)	35.9 ± 11.7	55.1 ± 19.6	< o.oo1

Table-I. Showing comparison of mean operative time by VAS (Visual Analogue Score), wound infection, Hospital stay after surgery in days and mean operative time of surgery in minutes among 2 groups.

DISCUSSION

Pilonidal sinus disease is very common among male patients and cause many symptoms which mostly include discharge from the sinus and pain in the sacral region. From past many decades the treatment of pilonidal sinus changed from conservative management to surgical treatment.[16] The whole purpose of treatment is to treat the infection from the sinus tract and to lessen the recurrence of the disease by excising the sinus tract.to achieve this objective many surgical options were advised but unfortunately none of them showed promising results.[17] From many past studies it is now evident that the main factor responsible for the recurrence of the pilonidal sinus is the presence of sinus tract in the midline and those surgical options which shift the midline of the sinus tract away from the center showed less recurrence rates. Among those procedures simple excision of the pilonidal sinus tract and Limberg flap showed promising results because of ease of procedure and less post operative pain, post operative infection and recurrence rates.[18]

Among all the surgical procedures done for pilonidal sinus, no single procedure showed promising results in terms of complete cure of the disease with no post operative pain, post operative infection and recurrence. Pilonidal disease in considered as an acquired condition and the procedure to cure this disease should be simple with aim to remove all the sinus tract and the predisposing factors which lead to development of this disease.[19] In literature the pilonidal disease is associated with hairs with all almost all the studies showed the sinus tract contains tuft of hairs in the sinus tract when sent for histopathology after the excision of tract. This led to the idea of pathogenesis of disease that prolong sitting cause breakage of hairs at sacrococcygeal area and infection lead to burial of these hairs into the skin making a sinus tract unable to heal.[20] However, despite extensive research there is still no seamless surgical procedure for pilonidal sinus with respect to the results of early and late complications.

In our study all of the patients were male showing 100 % predominance of pilonidal disease among male patients. Almost all studies showed less occurrence of pilonidal sinus in females. This decrease incidence of pilonidal sinus in female gender is because of less hair distribution relating to hormonal difference from the male patients. Another reason for less reported incidence of pilonidal sinus in females is privacy issues as females are more reluctant to seek medical advice and to undergo surgery. Few studies

showed incidence of pilonidal sinus in females but they are very less.[21] The mean presenting age of pilonidal sinus in our study was 45.88 ± 9.78 years which was almost similar to other studies which showed the presentation of disease in patients with age between 40 to 50 years.[22] Few studies showed the mean age of presentation is between 30 to 40 years of age but this depends on geographical variations.[23]

Over international reports, McCallum IJ et al. conducted a systemic review and meta-analysis on all studies on pilonidal sinus, in which only Five trials (559 participants) assessed the rate of wound infection in simple excision patient and Limberg flap.[24] They showed that the wound infection rates were similar in both groups while in our study wound infection rated were higher in Limberg flap group (4 (6.66%) in simple excision group and 11 (18.33%) in Limberg flap group P-Value=0.01). Few studies also supporting our study showing wound infection rate is similar in both groups.[25]

Post operative pain by visual analogue score (VAS) among both groups was also non-significant (P value <0.05). According to study done by Walker H et al, post operative pain is experienced more in patients of Limberg flap as compared to simple excision.[26]

Length of surgery is more in Limberg flap as compared to simple excision and it is due to difficult reconstruction of the flaps. Many studies showed the same results that intraoperative time is significantly more in Limberg flap as compared to simple excision.[27] This is also true for the length of hospital stay which in slightly higher in patients with Limberg flap. These results are also endorsed by the studies done by Dnyanmote A et al and Song Y et al which also showed that length of hospital stay and intraoperative time is more in patients underwent Limberg flaps.[28,29]

This study has few limitations. First it is a single center study, more studies from different hospitals are required to find more convincing evidence regarding best mode of surgical treatment for pilonidal sinus. Secondly sample size is relatively less and thirdly more treatment option should be compared with each other to identify a single most best treatment option for pilonidal sinus.

CONCLUSION

Simple excision of pilonidal sinus is better from Limberg flap in terms of post operative pain, wound infection, duration of surgery and length of hospital stay.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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AUTHORSHIP AND CONTRIBUTION DECLARATION

No.	Author(s) Full Name	Contribution to the paper	Author(s) Signature
1	Muhammad Aqeel	Substatical contributions to the design of the work, revising it critically for important intellectual content, final approval of the version to be published and agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.	
2	Ahmed Siddique Ammar		
3	Muhammad Shoaib		
4	Humaira Alam		
5	Wajahat Amir		
6	Abrar ul Hassan Pirzada