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Original Research Article

COMPARISON PRIMARY CLOSURE AND OPEN TECHNIQUE IN THE TREATMENT OF PILONIDAL SINUS SURGERY IN MTI-LADY READING HOSPITAL PESHAWAR

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ABSTRACT

Background: *Pilonidal sinus disease is a common condition that requires surgical intervention, with primary closure and open techniques being the two main approaches. While both methods aim to manage the disease and promote healing, they differ regarding postoperative recovery, complication rates, and overall outcomes. In many cases, primary closure offers benefits in terms of reduced recovery time and fewer complications, but the comparison between these two techniques remains underexplored in specific settings. This study aims to compare the clinical outcomes of primary closure and open techniques in the surgical management of pilonidal sinus.* ***Objective:*** *To compare the clinical outcomes of primary closure and open techniques in the surgical management of pilonidal sinus, focusing on wound healing time, hospitalisation duration, return to work, and postoperative complications.* ***Study Design:*** *Randomized controlled trial.* ***Settings:*** *The study was conducted at a tertiary care hospital.* ***Duration of Study****: April 2024 to November 2024* ***Methods:*** *A total of 60 patients with pilonidal sinus were randomly assigned into two equal groups. Group A underwent excision with primary closure, while Group B underwent excision with the wound left open to heal by secondary intention. Primary outcomes included hospitalization duration, wound healing time, and time to return to work. Secondary outcomes included complications such as wound infection and recurrence. Statistical analysis was performed using appropriate tests, including t-tests and chi-square tests, with p-values ≤ 0.05 considered significant.* ***Results:*** *Group A (primary closure) demonstrated significantly shorter hospitalization (4.37 ± 0.999 vs. 5.80 ± 1.27 days, $p < 0.0001$), faster wound healing (17.57 ± 1.72 vs. 44.73 ± 3.34 days, $p < 0.0001$), and earlier return to work (13.60 ± 2.47 vs. 30.43 ± 2.86 days, $p < 0.0001$) compared to Group B (open technique). Wound infection rates were lower in Group A (6.7%) compared to Group B (23.3%), with a statistically significant difference ($p = 0.01$). Recurrence rates were also lower in Group A (10.0%) compared to Group B (30.0%).* ***Conclusion:*** *Primary closure is more effective than the open technique in the surgical management of pilonidal sinus, offering faster recovery times, fewer complications, and better overall patient outcomes. When performed appropriately, this technique should be considered the preferred approach for pilonidal sinus surgery.*

Keywords: Pilonidal Sinus, Primary Closure, Open Technique, Wound Healing, Recurrence, Randomized Controlled Trial.

INTRODUCTION

A pilonidal sinus is a small, tunnel-like opening or tract in the skin, typically found near the tailbone at the cleft of the buttocks. It is often filled with hair, skin debris, and foreign materials. This condition predominantly impacts young adults, showing a greater prevalence in males than females, and is thought to be associated with genetic and environmental influences (1, 2). The intergluteal cleft is the most commonly affected region. Sacrococcygeal pilonidal sinus disease is a prevalent surgical issue, representing a substantial segment of patients receiving treatment in surgical clinics globally. It usually impacts young men and is not present during childhood, indicating that it likely has an acquired cause. The estimated prevalence of sacrococcygeal pilonidal sinus disease is 26 per 100,000 individuals, with males being affected twice as often as females (3-5).

The management of pilonidal sinus surgery typically requires a decision between two main surgical approaches: primary closure and the open technique, each presenting unique benefits and factors to consider (6). The primary closure technique entails the thorough removal of the pilonidal sinus followed by the immediate suturing of the wound. This approach may facilitate faster healing and yield a more aesthetically pleasing outcome. Nonetheless, this method carries the potential risks of heightened wound infection, strain on the closure, and the chance of recurrence if the sinus is not entirely removed. Conversely, the open technique, which involves leaving the wound exposed to heal through secondary intention, generally presents a reduced risk of infection and facilitates drainage, thereby enhancing the healing process from within (6-8).

An ideal method of therapy that is widely accepted has yet to be established, and in most cases, the surgeon relies on their own surgical experience. The optimal treatment should include reduced duration, affordability, fewer early complications following surgery, swift recovery, minimal hospital stay, quick return to work, and the lowest incidence of long-term recurrences (9-11).

The comparison of primary closure and open technique in pilonidal sinus surgery is driven by the necessity to identify which method offers the best balance in minimising recurrence, promoting optimal wound healing, and alleviating patient discomfort. Through a comparative analysis of these two techniques, researchers and clinicians seek to determine which method provides better long-term outcomes. This comparison plays a vital role in directing clinical practice and educating patients regarding each surgical option's possible advantages and disadvantages.

METHODOLOGY

This study employed a randomised controlled trial design at the general surgery department, Lady Reading Hospital, Peshawar, from

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April 2024 to November 2024. Sixty patients, aged between 18 and 55 years, were included in the study. The participants were randomly assigned to two equal groups of 30 patients, each using blocked randomisation to ensure balanced allocation.

Patients with chronic pilonidal sinus disease presenting to the surgical outpatient department were assessed for eligibility. Patients above 18 of both genders who were willing to participate in the study and adhere to follow-up schedules were enrolled. Patients with recurrent disease, acute abscesses, underlying malignancy, or those who were unfit for general anaesthesia were excluded from the study.

Standard blood tests, anaesthesia evaluations, and routine natal cleft shaving were all part of the preoperative preparation process. The procedures were performed under general anaesthesia with the patients in a prone position. The group having primary closure had an elliptical excision of the pilonidal sinus performed, which removed all sinus tracts and surrounding diseased tissue. Hemostasis was obtained using diathermy. The incision borders were approximated with subcutaneous absorbable sutures, and the skin was closed using nonabsorbable interrupted sutures. A suction drain was inserted and removed on the second postoperative day.

In the open technique group, the pilonidal sinus was excised similarly, but the wound was left open to heal by secondary intention. The wound was packed with a sterile dressing soaked in an antiseptic solution, which was changed regularly during follow-up visits. Patients in all groups were discharged once stable, with proper wound care instructions and follow-up sessions.

The primary outcome measures were hospitalisation duration, wound healing time (complete epithelialisation), and time to return to normal activities or work. Secondary outcomes included the incidence of complications, such as wound infections and recurrence. Follow-up was conducted for a minimum of six months, during which patients were assessed clinically at regular intervals for any signs of complications or delayed healing.

Data were collected using structured proformas and analysed using SPSS 24. Chi-square and Independent T-tests were deployed for comparison, keeping the value of P significant at < 0.05.

RESULTS

Sixty patients were divided into groups A and B: Group A had primary closure, and Group B had open technique. The mean age and BMI in both groups can be seen in Table no 1. Gender distribution is presented in Figure 1.

Clinical outcomes revealed a notable difference in hospitalisation duration, with Group A requiring 4.37 ± 0.999 days versus 5.80 ± 1.27 days in Group B ($p < 0.0001$). The time to return to work was also notably shorter in Group A at 13.60 ± 2.47 days versus 30.43 ± 2.86 days for Group B ($p < 0.0001$). Similarly, wound healing time was notably reduced in Group A, averaging 17.57 ± 1.72 days compared to 44.73 ± 3.34 days in Group B ($p < 0.0001$).

Regarding complications, wound infections occurred in 6.7% of Group A and 23.3% of Group B participants, with an overall infection rate of 15.0%. Recurrence rates were 10.0% in Group A and 30.0% in Group B, resulting in an overall recurrence rate of 20.0%. Only one participant (3.3%) in Group B experienced wound infection and recurrence, while no such cases were reported in Group A. Most participants in Group A (83.3%) experienced no complications, compared to 43.3% in Group B ($p = 0.01$).

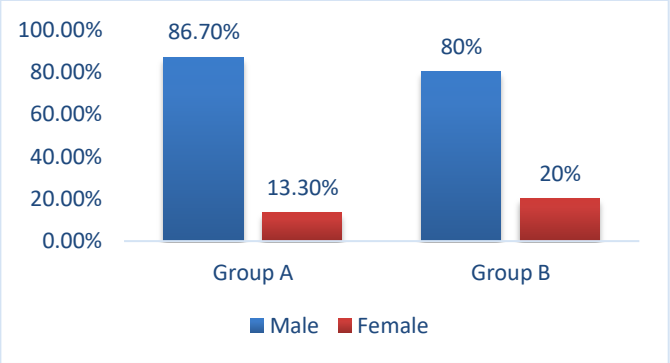

Figure 1 Gender-wise distribution between both groups

Table 1: Demographics

Groups		Age (years)	BMI (Kg//m^2)
Group A (Primary Closure) (n = 30)	Mean	33.50	25.6930
	Std. Deviation	9.836	2.70723
Group B (Open technique) (n = 30)	Mean	35.40	26.0710
	Std. Deviation	12.645	2.64756

Table 2: Comparison of clinical outcomes between both groups

Clinical outcomes	Groups	N	Mean	Std. Deviation	P value
Hospitalisation (Days)	Group A (Primary closure)	30	4.37	.999	0.0001
	Group B (Open technique)	30	5.80	1.270	
Return to work (Days)	Group A (Primary closure)	30	13.60	2.472	0.0001
	Group B (Open technique)	30	30.43	2.861	
Wound healing (Days)	Group A (Primary closure)	30	17.57	1.716	0.0001
	Group B (Open technique)	30	44.73	3.342	

Table 3: Complications between both groups

		Groups		Total	P value
		Group A (Primary closure)	Group B (Open technique)		
Complications	Wound infection	2	7	9	0.01
		6.7%	23.3%	15.0%	
	Recurrence	3	9	12	
		10.0%	30.0%	20.0%	
	Wound infection and recurrence	0	1	1	
		0.0%	3.3%	1.7%	
	No	25	13	38	
		83.3%	43.3%	63.3%	
Total		30	30	60	
		100.0%	100.0%	100.0%	

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DISCUSSION

The results of this study, which included 60 patients divided into two equal groups, provide valuable insights into the comparative efficacy of these methods. In our study, mean hospitalisation duration was notably shorter for the primary closure group (4.37 ± 0.999 days) compared to the open technique group (5.80 ± 1.27 days, $p < 0.0001$). This trend is supported by findings from Shah STA et al., who reported an average hospital stay of 3.5 ± 0.65 days for primary closure and 4.7 ± 0.58 days for the open technique, emphasising the advantage of primary closure in reducing inpatient care time (12). Similarly, Anandaravi BN et al. observed that hospitalisation duration was marginally shorter for primary closure, although both techniques showed overlap in this metric (7). The consistency of these findings across studies underlines the efficiency of primary closure in minimising resource utilisation in hospital settings.

Wound healing time is a critical metric influencing patient satisfaction and recovery. The results of this study revealed a significantly shorter wound healing time for primary closure (17.57 ± 1.72 days) compared to the open technique (44.73 ± 3.34 days, $p < 0.0001$). McCallum IJ et al. also noted faster epithelialisation in wounds treated with primary closure than open healing.13 Anandaravi et al. also observed more rapid healing with primary closure (14.2 days) versus open techniques (51.6 days) (7).

Time to return to work is another pivotal outcome. In this study, patients undergoing primary closure returned to work significantly earlier (13.60 ± 2.47 days) than those treated with the open technique (30.43 ± 2.86 days, $p < 0.0001$). These findings are in line with the observations of Shah STA et al., who reported an earlier return to work for patients in the primary closure group (16.42 ± 5.46 days) compared to the open technique group (29.0 ± 3.72 days) (12). The rapid recovery associated with primary closure can be attributed to shorter wound healing times and reduced postoperative discomfort, critical for patients eager to resume daily activities.

The incidence of complications is a crucial determinant in selecting the optimal surgical technique. This study showed a notably lower wound infection in the primary closure group (6.7%) than the open technique group (23.3%, $p = 0.01$). The recurrence rate was also lower in the primary closure group (10.0%) than in the open technique group (30.0%). These findings echo those of Pfammatter M et al., who reported lower recurrence rates in patients treated with primary closure (12.5%) compared to open wound care (37.5%) (14). However, McCallum IJ et al. highlighted that while primary closure is associated with faster healing, the risk of recurrence may increase if midline closures are employed, underscoring the importance of off-midline techniques in reducing long-term complications (13). Furthermore, Anandaravi BN et al. found that primary closure was superior in minimising wound infections and recurrence rates, reinforcing the benefits of this technique (7). Despite these advantages, recurrence remains a concern, particularly in patients with higher body mass indices or complex sinus tracts.

CONCLUSION

This study demonstrated that primary closure is superior to the open technique for treating pilonidal sinus, offering faster healing, earlier return to activities, shorter hospital stays and fewer complications. With proper technique, primary closure can be a practical and preferred approach.

DECLARATIONS

Data Availability statement

All data generated or analysed during the study are included in the manuscript.

Ethics approval and consent to participate

Approved by the department concerned. (IRBEC-TCH-099/23)

Consent for publication

Approved

Funding

Not applicable

CONFLICT OF INTEREST

The authors declared the absence of a conflict of interest.

AUTHOR CONTRIBUTION

***WAJID* (Post Grduate Resident)**
Data Analysis,and Development of Research Methodology Design
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Study Design, and Final approval of manuscript
***SIDRA JABEEN* (Consultant)**
Conception of Study.
***AIMA AKBAR* (Post Graduate Resident)**
Manuscript revisions
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Manuscript Review.
***WISHAL SHAUKAT* (International Training Fellow)**
Review of Literature.
***NAILA GUL* (Post Graduate Resident)**
Critial Input

REFERENCES

1. Mahmood F, Hussain A, Akingboye A. Pilonidal sinus disease: a review of current practice and prospects for endoscopic treatment. Ann Med Surg. 2020;57:212-7.
2. Iesalnieks I, Ommer A. The management of pilonidal sinus. Dtsch Arztebl Int. 2019;116(1-2):12.
3. Can MF, Sevinc MM, Yilmaz M. Comparison of Karydakis flap reconstruction versus primary midline closure in sacrococcygeal pilonidal disease: results of 200 military service members. Surg Today, 2009; 39(7):580-6.
4. Kosaka M, Kida M, Mori H, Kamiishi H. Pilonidal cyst of the scalp due to single minor trauma. Dermatol Surg. 2007; 33(4):505-7.
5. McCallum I, King PM, Bruce J. Healing by primary versus secondary intention after surgical treatment for pilonidal sinus. Cochrane Database Syst Rev 2007(4): CD006213.
6. Jamil MA, Anwar MI, Saleem MW, Tahir SA, Javaid HA. Comparison of two Different Surgical Modalities in treating Pilonidal Sinus (Primary Closure and Open Technique). Pak J Med Health Sci. 2021;15(11):2999-3001.
7. Anandaravi BN, Viswanathan A. Comparative study between excision with lay open and excision with primary closure in the treatment of pilonidal sinus. Int Surg J. 2019;6(4):1242-6.
8. A Mansour M, A Bahbah M, Mohammed Zain A, A El-Begawy M. Pilonidal Sinusectomy and Primary Closure Versus Excision and Primary Closure in Pilonidal Sinus Disease. Benha Med J. 2024.

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9. Keshava A, Young CJ, Rickard MJ FX, Sinclair G. Karydakis flap repair for sacrococcygeal pilonidal sinus disease: How important is technique? ANZ J Surg 2007;77 (3):181-3.
10. Ekici U, Kanlıöz M, Ferhatoğlu MF, Kartal A. A comparative analysis of four different surgical methods for treatment of sacrococcygeal pilonidal sinus. Asian J Surg. 2019;42(10):907-13.
11. Wu P, Zhang Y, Zhang Y, Wang S, Fan Z. Progress in the surgical treatment of sacrococcygeal pilonidal sinus: a review. Int J Surg 2023;109(8):2388-403.
12. Shah STA, Tahir M, Nasir M, Paracha SA, Wahab K. Outcome of open versus closed technique for surgical treatment of chronic pilonidal sinus: A randomised controlled trial. Khyber Med Univ J. 2013;5(3):146–51.
13. McCallum IJ, King PM, Bruce J. Healing by primary closure versus open healing after surgery for pilonidal sinus: systematic review and meta-analysis. BMJ. 2008; 336(7649):868-71.
14. Pfammatter M, Erlanger TE, Mayr J. Primary Transverse Closure Compared to Open Wound Treatment for Primary Pilonidal Sinus Disease in Children. Children (Basel). 2020 Oct 17;7(10):187.

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