

Original Research Article

Outcomes of Limberg flap repair in recurrent pilonidal sinus disease: a study in a district hospital of Bangladesh

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Received: 05 March 2024

Accepted: 29 March 2024

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ABSTRACT

Background: Pilonidal sinus disease (PSD) is a chronic condition affecting the sacrococcygeal region, often seen in young adults. Numerous surgical techniques have been documented in medical literature for its treatment. This study aimed to evaluate the outcomes of the Limberg flap repair (LFR) in recurrent pilonidal sinus disease.

Methods: This prospective observational study was conducted in the General Hospital, Nilphamari, Bangladesh from January 2021 to December 2022. The study included 47 cases of recurrent PSD scheduled for LFR, selected through purposive sampling. Data analysis was conducted using Microsoft office tools.

Results: In the analysis of outcomes, the study found the following mean±SD values: operation duration of 53.4±7.2 minutes, first mobilization at 1.1±0.2 days, work incapacity for 7.3±1.5 days, pain visual analog score (VAS) score of 1.7±0.3, complete healing in 21.7±7.9 days, and painless toilet seating achieved in 1.2±0.6 days for all participants. Postoperative complications included seroma (8.5%) and hematoma (6.4%) in more than 5% of participants. Most patients achieved excellent results (62%), followed by 21% with good and 17% with fair outcomes.

Conclusions: LFR stands out as an effective and safe treatment option for recurrent PSD. It offers advantages such as reduced complication rates, shorter hospital stays, quicker return to work, minimal pain, and high patient satisfaction.

Keywords: Outcomes, Limberg flap repair, Pilonidal sinus disease, Sacrococcygeal region, Bangladesh

INTRODUCTION

Pilonidal sinus disease (PSD) is a prevalent condition affecting the natal cleft in the sacrococcygeal region, characterized by the accumulation of weak hair in the hair follicles, which can lead to chronicity and occasional acute exacerbations.^{1,2} This condition, which predominantly affects young men, has an estimated incidence of approximately 26 cases per 100,000 individuals and is considered benign in nature.^{3,4} The exact causes and development of PSD remain unclear, but it is believed to stem from the accumulation of weak, lifeless hair in the

intergluteal region, leading to a reaction that forms abscesses and sinus tracts over time. Factors such as obesity, trauma, local irritation, and a sedentary lifestyle are commonly linked to PSD.^{2,5} Despite various treatment options, including conservative and surgical approaches, recurrence rates for PSD remain high.⁶ Successful recoveries typically involves complete removal of the pilonidal sinus or sinuses, followed by appropriate reconstruction.⁷ Originally, pilonidal disease was believed to be a congenital condition stemming from abnormal skin in the gluteal cleft. However, it is now understood as an acquired condition triggered by the presence of hair in the gluteal cleft.⁸ Surgical managements of PSD aims at

eradicating the sinus tract, ensuring complete healing of the overlying skin, and preventing recurrence. Various surgical methods, including wide excision, are available for treating PSD. Following excision, the wound may be left open to heal through granulation tissue or closed immediately using methods such as midline closure or flaps. Nonetheless, consensus on the optimal treatment approach is yet to be reached.⁹ This study aimed to evaluate the outcomes of the Limberg flap repair (LFR) in recurrent pilonidal sinus disease.

METHODS

This was a prospective observational study that was conducted in the General Hospital, Nilphamari, Bangladesh from January 2021 to December 2022. The research comprised 47 cases of recurrent PSD slated for LFR, chosen via purposive sampling. Appropriate written consent was obtained from all participants before data collection. The inclusion criteria for this study encompassed patients of both genders aged over 18 years who had recurrent sacrococcygeal pilonidal sinus or recurrence following an open-method technique. Conversely, patients presenting with pilonidal abscess, diabetes mellitus, those deemed unfit for surgery, individuals declining participation in the study, and those with loss of follow-up were excluded based on the exclusion criteria of this study. The LFR procedure was performed under spinal anesthesia with prophylactic antibiotics administered. The extent of excision and flap design were determined by marking the gluteal region. A rhombus-shaped pattern was drawn to encompass the pathological area slated for excision, ensuring the inclusion of all diseased tissues. The flap was meticulously raised off the gluteal fascia, particularly emphasizing

careful dissection to preserve the feeding arteries situated in the inferior aspect of the flap. Subsequently, the flap was transposed medially to fill the defect site without undue tension. Following flap transposition, the defect in the gluteal region was primarily closed. Short-term outcomes of the procedure were assessed over a 6-month follow-up period. Patients were scheduled for routine visits on postoperative days 3, 6, 9, and 14 for wound assessment and suture removal. Any wound-related complications were meticulously documented. Patients were also invited for follow-up appointments at 3- and 6-months post-surgery. Data analysis was performed using Microsoft office tools.

RESULTS

In this study, most of the participants (93.6%) were male and the mean±SD age of the patients was 26.8±6.7 years. On the other hand, the mean±SD body mass index (BMI) of the cases was 24.9±3.7 kg/m². The clinical presentation characteristics were distributed as follows: 21.3% of patients had single sinuses with dry presentation, 19.1% had multiple sinuses with dry presentation, 44.7% had a single sinus with serous discharge, and 14.9% (n=7) had a single sinus with pus discharge. In analyzing the outcomes, the study revealed mean±SD operation duration of 53.4±7.2 minutes, first mobilization at 1.1±0.2 days, 7.3±1.5 days of work incapacity, pain VAS score of 1.7±0.3, complete healing in 21.7±7.9 days, and painless toilet seating achieved in 1.2±0.6 days for the total participants. In more than 5% of the participants, seroma (8.5%) and hematoma (6.4%) were observed as postoperative complications. According to the patient's opinions, most of the patients (62%), got excellent results followed by 21% got good and 17% got fair results.



Figure 1 (A-D): LFR-image.

Table 1: Demographic data.

Variables	
Age (years) (Mean±SD)	26.8±6.7
Male (%)	44 (93.6)
Female (%)	3 (6.4)
BMI (kg/m ²) (Mean±SD)	24.9±3.7

Table 2: Clinical presentation.

Characteristics	N	%
Single sinuses and dry	10	21.3
Multiple sinuses and dry	9	19.1
Single sinus and serous discharge	21	44.7
Single sinus and pus discharge	7	14.9

Table 3: Outcomes.

Variables	Mean±SD
Duration of operation (min)	53.4±7.2
First mobilization (days)	1.1±0.2
Incapacity for work	7.3±1.5
Pain VAS score	1.7±0.3
Complete healing time (days)	21.7±7.9
Painless toilet seating (days)	1.2±0.6

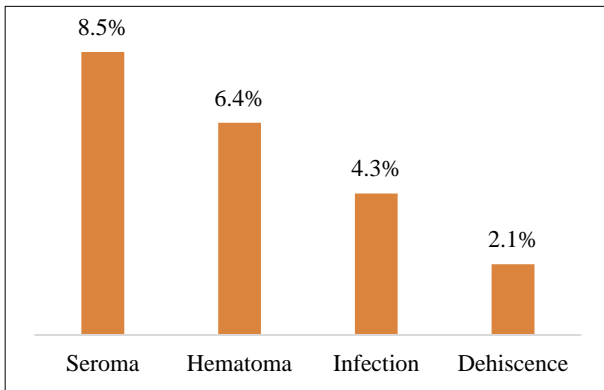


Figure 2: Postoperative complications.

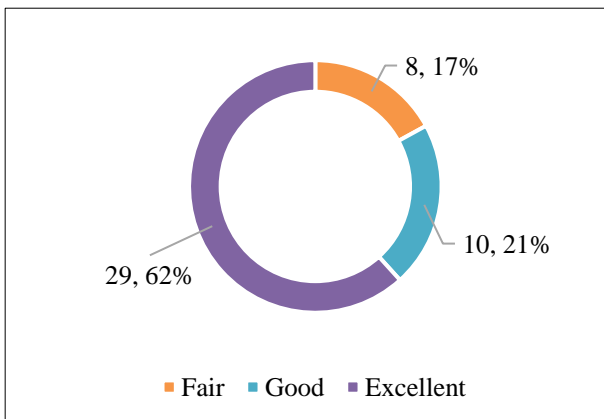


Figure 3: Patient satisfaction.

DISCUSSION

PSD predominantly affects males after puberty and is more prevalent among individuals of Arab, European, and American descent.¹⁰ Conversely, it is relatively uncommon in East and Southeast Asia, particularly among females. The condition earned the moniker "jeep cyst" due to its frequent occurrence among American soldiers who operated jeeps during World War II.¹¹ However, among individuals of Asian descent, diagnosis and treatment are often delayed due to the rarity of the disease.¹²

In this study, the majority of participants (93.6%) were male, with a mean age of 26.8±6.7 years. These findings align closely with those reported in studies by Ahmed et al and Bali et al.^{9,13} In our study, the clinical presentation characteristics were as follows: 21.3% of patients presented with a single sinus and dry symptoms, 19.1% had multiple sinuses with dry symptoms, 44.7% had a single sinus with serous discharge, and 14.9% presented with a single sinus discharging pus. Similar clinical features were also observed by Song et al in their study.¹⁰

Analyzing the outcomes, our study revealed a mean operation duration of 53.4±7.2 minutes, with patients achieving first mobilization at 1.1±0.2 days, experiencing incapacity for work for 7.3±1.5 days, reporting a pain VAS score of 1.7±0.3, achieving complete healing within 21.7±7.9 days, and attaining painless toilet seating in 1.2±0.6 days for all participants. Similar outcomes were reported in other studies as well.^{10,13}

In our study, postoperative complications such as seroma (8.5%) and hematoma (6.4%) were observed in more than 5% of participants. Similar complications were also noted by Baz et al.¹⁴ Patient feedback indicated that the majority (62%) experienced excellent results, followed by 21% reporting good outcomes and 17% reporting fair outcomes. Comparable levels of patient satisfaction were reported in a study by Elsayed et al.¹⁵ Consistent with our findings, Bali et al concluded that the Limberg flap procedure is a safe and effective option for treating recurrent pilonidal sinus disease, citing its low complication rate, short hospital stays, early return to work, low pain scores, high patient satisfaction, and shorter healing duration.¹³ Consequently, we also advocate for the use of the Limberg flap procedure in treating recurrent pilonidal sinus disease. These findings provide valuable insights for future research in this area.

Limitations

This study was limited by its single-center design and small sample size. Additionally, the relatively short duration of the study may have restricted the generalizability of the findings to the broader population. Therefore, caution should be exercised when interpreting these results, as they may not fully represent the broader scenario across the entire country.

CONCLUSION

Recurrence poses a significant challenge in managing recurrent PSD. However, Limberg flap repair emerges as a promising solution, offering effectiveness and safety in its treatment. This approach boasts several advantages, including reduced complication rates, shorter hospital stays, quicker return to work, minimal postoperative pain, and high levels of patient satisfaction. By addressing the underlying issues contributing to recurrence and providing durable closure, Limberg flap repair demonstrates its efficacy as a preferred treatment option for recurrent PSD, improving outcomes and enhancing the overall quality of care for affected individuals.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Rajib MMU, Afroz MM, Islam MM, Rahman K, Ahmed T. Outcomes of Limberg flap repair in recurrent pilonidal sinus disease: a study in a district hospital of Bangladesh. *Int Surg J* 2024;11:886-9.