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A Comparative Study of Excision with Primary Closure Versus Limberg Flap in Pilonidal Sinus

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Abstract
A condition observed in the natal cleft atop the coccyx is referred to as the pilonidal sinus and is treated by excision. Two groups of twenty-five patients each were created (Groups A and B). Patients in Group B had wide-open excision surgery with secondary intention healing, whereas patients in Group A received reconstruction surgery using a Limberg flap. Patients were told about the nature of surgical operations and their informed permission was obtained. The extensive excision group's mean age was 29±7 years, whereas the Limberg flap group's mean age was 29±8 years. Due to participant randomization within each group, there was little variation in the means of the two groups. When the pain levels of the study participants were compared between the two groups using the visual analogue scale (VAS), it was found that Group A's mean VAS score was higher on postoperative Days 1, 3 and 7 than Group B's, indicating that the study participants who underwent Limberg flap reconstruction surgery experienced more pain. For primary pilonidal illness with low morbidity rates, we prefer the Limberg flap technique to primary closure.

INTRODUCTION

The term jeep disease has been used while Herbert Mayo initially described the illness in 1883, Hodge was the first to adopt the term pilonidal, which comes from the Latin for hair (pilus) and nest (nidus), in 1880[1]. Sweating, maceration, bacterial contamination hair penetration are all encouraged in a deep natal cleft. Therefore, these contributing elements need to be removed in order to cure and prevent[2]. Men are affected twice as often as women, with an estimated incidence of 26 cases per 100,000 persons[3]. Because of the impact of sex hormones on pilosebaceous glands and modifications to the formation of healthy body hair, it is more prevalent in individuals aged 15-30 years after puberty[4]. Following initial excision, the surgical incision may be closed using primary closure (primary intention) or allowed to heal naturally via open healing (secondary aim)[5]. However, due to the incision's common location in a deep midline cleft that experiences strain and a tendency to retain hair[6]. PNS illness might manifest as acute, chronic, recurring, or asymptomatic. The most often occurring symptoms are localised edoema (78%), discharge (74%) discomfort[7]. However, a comprehensive clinical examination, history collection radiographic studies like MRI may be required to rule out additional alternative diagnoses, such as perirectal abscess, anal fistula, hidradenitis suppurativapyoderma gangrenosum. PNS has a significant socioeconomic effect on people who are afflicted and is associated with a high incidence of morbidity[8]. For sacrococcygeal PNS illness, a number of surgical methods have been explored, such as opening the track, treating with phenol chemically, marsupialization, broad excision, excision with primary simple midline or asymmetric closure methods using different plastic surgeries. As each of the available treatments for this illness has pros and cons of its own, it is difficult to determine which is the best. As of yet, no universally recognised and ideal course of therapy has been developed, instead, the surgeon usually makes use of his own surgical expertise. A treatment plan with the lowest possible risk of recurrence should be shorter in duration, less expensive, have fewer surgical complications, need less time in the hospital allow for a prompt return to work[9]. There are a number of problems connected to every surgery. The primary hazard is recurrence, additional complications include wound dehiscence from infection and postoperative discomfort. The clinical presentation, whether acute or chronic the surgical treatment approach have a significant impact on the recurrence rate[10]. Developed in 1948 by Alexander Limberg, the Limberg flap is a transposition flap used to fill a rhomboid-shaped defect with opposing sides of equal length, opposite medial and lateral angles of 120°superior and inferior angles of 60°. This allows the donor site and rhomboid-shaped defect to close without stress[11,12]. In terms of disease recurrence, flap failure postoperative complications, this is the most effective therapy for chronic sacrococcygeal PNS illness, according to many studies[13].

There are still issues with this new technology, such standardizing methods to lessen heterogeneity and obtaining prospective trial data of the highest quality. In addition, the expenses associated with developing an endoscopic method, the length of time it takes for surgeons to master the procedure the potential for repeat procedures need to be taken into account[14].

MATERIALS AND METHODS

Each case was given a careful evaluation and investigation before being approved for inclusion in this research. Two groups of twenty-five patients each were created (Groups A and B). Patients in Group B had wide-open excision surgery with secondary intention healing, whereas patients in Group A received reconstruction surgery using a Limberg flap. Patients were told about the nature of surgical operations and their informed permission was obtained. Excluded from the trial were patients with immunocompromised individuals, patients with recurring illness, patients who had undergone prior surgery and patients with any other substantial comorbidity such diabetes mellitus that might have affected the results.

Inclusion Criteria: Every patient seeking surgical therapy for pilonidal sinus illness who comes to the surgical outpatient department.

Exclusion Criteria: Patients under the age of twelve, those with recurrent disease, those who have had surgery in the sacrococcygeal region, patients with severe hirsutism in female patients, patients with psychiatric conditions, patients with poor hygiene patients who are contraindicated for spinal anaesthesia or prone positioning are among the patients who are at risk for developing an abscess formation.

All patients received preoperative treatment, anaesthetic assessment postoperative follow-up from the same surgeon, following the same clinical protocols. The discharge report, operation notes, laboratory findings outpatient clinical notes were all examined. Following surgery, all patients were released on Day 3 and monitored for a further 6 months in order to evaluate outcomes and provide a comparison. Version 23 of the statistical software for social sciences (SPSS, IBM, Armonk, New York, USA) was used to concurrently collect, inputcode the data.

To provide a frequency and percentage summary of the sample characteristics, descriptive statistics were computed. A dependent variable and several independent variables were analysed analytically and inferentially. Standard significance was set at 0.05.

RESULTS AND DISCUSSIONS

In this study, most of the study participants were in the age group of 18-27 years in both groups. Male preponderance (77%) was observed in the study with the mean age of study participants of 28 years. The mean age in the Limberg flap group was 29±8 years and that in the wide excision group was 29±7 years. There was not much difference in the mean age of both the groups as participants were randomly distributed in each group. Comparison of visual analog scale (VAS) scores for pain among study participants of both the groups showed that on postoperative Days 1, 37 mean VAS score was higher for Group A as compared to Group B, depicting more pain among the study participants who underwent Limberg flap reconstruction surgery. Although, during follow-up visits at 1,2,34 months study participants in Group A did not complain of any pain. At 1 and 2 months follow-ups, the mean VAS score observed by study participants in Group B was 4±1 and 2±1, respectively (Table 1).

On comparing the VAS for anxiety (VAS-A) score for postoperative anxiety/stress, higher mean scores were observed in study participants of Group B who underwent wide excision, depicting higher anxiety/stress levels among them. Study participants in Group A also reported significant mean VAS-A scores till one week due to the presence of negative drain and sutures. The participants, however, reported no anxiety after drain and suture removal at 1, 2,34 months visit. A mean VAS-A score of 12±14 at 4-month follow-up was still reported by study participants in Group B which could be attributed to the long time taken for wound healing the psychological stress of daily dressings in such patients (Table 2).

In the present study, mean healing time in Group A was 21±3 days and in Group B was 58±12 days and this difference in mean was statistically significant. Also, days of work loss were significantly less in Group A, No cases of wound infection were seen in study participants who underwent Limberg flap reconstruction surgery. However, 21% of the study participants who underwent wide-open excision surgery with healing by secondary intention (Group B) had wound infection. None of the study participants in our study had recurrence of the disease.

In boys, PNS is most common in the second and third decades of life, after puberty[15]. The majority of participants in the current research were male and aged between 18 and 27, which is consistent with the literature. Many of them reported having sat for extended periods of time at their professions and having more hair growing in the sacrococcygeal area. Comparable outcomes were documented by Singh *et al.,* with the majority of patients being male and in the 20-30 age range[15]. Similar findings were found by Sondenaa *et al*. when they conducted a prospective evaluation of 322 patients with pilonidal illness and determined that the incidence is 10 times greater in males than in women[16]. The mean VAS score for pain on Days 1, 37 was higher in Group A than in Group B, suggesting that postoperative discomfort was higher among the study participants who had Limberg flap repair surgery. This may be explained by the drain fixation over the skin and non-absorbable nylon sutures, which increase discomfort. At follow-up visits at 1, 2, 34 months, most of the individuals in Group A reported a VAS score of zero, indicating a considerable reduction in pain after the removal of the drain and sutures. According to a research by Alam *et al.,* pain was felt by 66.7% and 33% of study participants in Group A (the Limberg technique) and Group B (wide excision), respectively[17].

Additionally, in this study, research participants in Group B who had broad excision had higher mean VAS-A ratings for postoperative anxiety levels, suggesting greater anxiety levels among them. This may be explained by the existence of an open wound, the need for daily care in the presence of a relative the expectation of rapid wound recovery. There were no instances of wound infection among study participants who had Limberg flap repair surgery (Group A) in the current investigation. However, 20% of research participants who had wide-open excision surgery experienced wound infection in spite of regular antiseptic daily dressing. In their research, Jabbar *et al.* found that 16.67% of patients undergoing a Limberg flap treatment and 20% of patients undergoing an open procedure had wound infections[18]. Comparably, 33% of infections in extensive excision and just 13% in the Limberg surgery were documented by Alam[17] According to Singh *et al.,* wound infections prolonged hospital stays for five patients in the group receiving Limberg flap surgery and six patients receiving wide excision surgery[15].

The mean healing time in Group B was 57±11 days, whereas in Group A it was 20±2 days. This difference was statistically significant in the present investigation. Additionally, Group A had considerably less missed workdays (22±2 days) than Group B (31±5 days). After the sutures were removed, patients who had Limberg flap repair could resume their job, however, patients who underwent broad local excision were reluctant to do so because they were very anxious about the wound and the need for daily dressings. Our results are consistent with the mean healing time of 17.0±8.0 days

Table 1: Comparison of mean VAS scores for postoperative pain among different groups

VAS score	Group A	Group B
	Mean ± SD	Mean ± SD
Day 1	9 ± 2	8 ± 2
Day 3	9 ± 2	8 ± 2
Day 7	6 ± 2	5 ± 2
1 Month	0	4 ± 0
2 Months	0	2 ± 0
3 Months	0	0
4 Months	0	0

Table 2: Comparison of mean VAS-A scores for postoperative anxiety among different groups

VAS-A score	Group A	Group B
	Mean ± SD	Mean ± SD
Day 1	84 ± 9	88 ± 6
Day 3	74 ± 9	82 ± 7
Day 7	60 ± 7	73 ± 7
1 Month	0	57 ± 8
2 Months	0	47 ± 7
3 Months	0	37 ± 12
4 Months	0	11 ± 15

Table 3: Comparison of mean of days of work loss and time taken for wound healing across different groups

	Group A Mean	Group B	t p-value SD Mean ± SD	
Days of work loss	23 ± 3	32 ± 6	8.607 0.000	
Time for wound healing (days)	21 ± 3	58 ± 12	17.402	0.000

for group II (rhomboid excision with Limberg flap reconstruction) and 60±9.6 days for group III (open excision with healing by secondary intention) in the research conducted by Kumar *et al*. No recurrence was seen in either group throughout the current investigation. Similar findings were published by Kumar et al., who found that neither group's research subjects had any recurrences. In contrast, 16% of recurrences were documented in the broad excision group by Singh et al.15 Alam et al. further noted that there was just one instance of recurrence in the Limberg surgery and 33% in the extensive excision group[17].

Despite this, there was no information on post-operative discomfort with long-term follow-up. Similar results were obtained by Akca *et al* and Mahdy[19,20]

Rebuilding the residual defect region is the primary technical issue in pilonidal surgery, not removing the cyst and all of the sinuses in the process. The failure to flatten the natal cleft, the tissue tension the midline incision scar are the causes of the primary closure method's unfavourable outcomes.

CONCLUSION

The goal of the current research was to compare the results of two alternative approaches to pilonidal sinus surgery: Limberg flap and excision with primary closure. Specifically, the study looked at post-operative problems, length of hospital stay, recurrence operating time. For primary pilonidal illness, we suggest the Limberg flap approach since it has lower morbidity rates than primary closure, nevertheless, further research with a bigger volume sample and a longer follow-up time is required.

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