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Management of Pilonidal Sinus in Manipal Teaching Hospital: A Cross-sectional Study

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ABSTRACT

Introduction: The study aimed to assess the effectiveness of various surgical treatments for pilonidal sinus, including excision with primary closure, endoscopic pilonidal sinus treatment (EPSiT) and rhomboid flap reconstruction.

Methods: This cross-sectional study was conducted in Department of General Surgery, Manipal College of Medical Sciences, Pokhara, Nepal, from March 2020 to January 2023, following institutional review board approval (Reference number: MEMG/IRC/504/GA) and obtaining written informed consent. Patients of all genders and ages diagnosed with pilonidal sinus were included. Data were analyzed using SPSS version 25.0, with results presented as mean ± SD, frequency, and percentage. A p-value ≤ 0.05 was deemed statistically significant.

Results: The study included 67 participants, with 49 males (73.1%) and 18 females (29.6%), averaging 23.61±6.87 years in age. Thirty-one patients (46.2%) underwent rhomboid flap surgery, 30 (44.8%) patients underwent EPSiT, 6 (9%) patients had excision with primary repair. Complications were seen in 17 patients (25.37%), including surgical site infections (16.4%), recurrence (7.5%), and dehiscence (1.5%). Average hospital stay was 4.07±3.51 days, surgery duration was 51.61±17.91 minutes, and drain removal occurred at 4.72±3.98 days. Surgery duration was comparable in EPSiT and excision with primary repair (p=0.08) whereas it was significantly less when compared to rhomboid flap (p=0.00). Hospital stay and drain duration were significantly less in EPSiT when compared to the other two treatment modalities. The complications were similar across the three treatments.

Conclusions: EPSiT had shorter duration of hospital stay and drain days than rhomboid flap reconstruction or primary closure. The complications were similar across various treatment modalities.

Keywords: *EPSiT; pilonidal sinus; primary closure; rhomboid flap.*

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INTRODUCTION

Pilonidal sinus is a common condition characterized by a pit or abscess near the coccyx, often leading to discomfort and infection.[1] Various surgical management options exist, including excision with primary repair, EPSiT (Endoscopic Pilonidal Sinus Treatment), rhomboid flap repair, and incision

and drainage with curettage.[2] Each technique has distinct implications for postoperative hospital stay, drain removal timing, and complication rates such as surgical site infections, wound dehiscence, and recurrences.[2]

Understanding the outcomes of different surgical methods is crucial for optimizing treatment strategies and improving patient care. Comparative data on hospital stay durations, timing of drain removals, and complication rates can guide clinicians in selecting the most effective approach for individual cases, ultimately enhancing patient recovery and reducing long-term issues.

We conducted this study to evaluate the efficacy of various surgical interventions for pilonidal sinus, specifically focusing on postoperative hospital stays, timing of drain removal, and complication rates including surgical site infections, wound dehiscence, and recurrences.

METHODS

This cross-sectional study was conducted in the Department of General Surgery, Manipal College of Medical Sciences, Pokhara, Nepal from March 2020 to January 2023. The study was conducted after approval from institutional review board (Reference number: MEMG/IRC/504/GA). Data collection was done for which the written and informed consent was obtained from all cases.

The patients of both the gender and all age group diagnosed with pilonidal diseases were enrolled in the study. Patients with immunodeficiency, congenital asymptomatic pits, psychiatric disorders that hinder surgical procedures, pregnant women, and those who declined participation in the study were excluded.

Patients diagnosed with pilonidal abscess underwent incision and drainage with curettage. Whereas, infected pilonidal sinus, recurrent pilonidal sinus and pilonidal sinus patients were given choices for excision and primary repair, rhomboid flap and Endoscopic Pilonidal Sinus Treatment (EPSiT). EPSiT was implemented at our institute by the principal investigator on September 18, 2019, and has since become one of the innovative treatment options for pilonidal disease.

Demographic information, including age and gender, was collected. Detailed operative and clinical records were maintained, documenting operative durations, the length of postoperative hospital stays, the timing of drain removals, and complications such as surgical site infections, wound dehiscence, and recurrences. Additionally, the time taken for wound healing in EPSiT was also noted.

Excision and primary repair: The procedure was conducted under spinal anesthesia (SA). Following the administration of SA, the patient was positioned in a prone position, with both gluteal muscles abducted and secured with adhesive tapes on either side of the operating table to facilitate exposure of the intergluteal fold. Upon visualization of the sinus orifices, along with any secondary pits if present, an elliptical incision was made. The pathological tract was excised through an elliptical incision, with dissection carried out until reaching the posterior sacral fascia. Complete hemostasis was achieved utilizing either monopolar or bipolar diathermy. A romovac negative suction drain was then inserted into the wound cavity and secured externally. The closure was performed in a tension-free manner in two layers, incorporating bilateral side flaps of skin and subcutaneous tissue to minimize dead space. Subcutaneous tissue was opposed with absorbable sutures whereas skin was opposed with non-absorbable sutures. Drains were

removed after a period of 3 to 4 days, or longer, depending upon the volume of output from the drain. The removal of the drain occurred when the output fell below 10 ml within the preceding 24 hours. All patients were discharged either after 3 to 4 days or at their own request. Regular follow-up appointments were scheduled for patients, during which dressings were changed consistently. The sutures were removed two weeks following the surgical procedure.[3]

Rhomboid Flap: Patients were kept in prone position with buttock strapped apart under SA.

A rhombic view lines were marked over the pilonidal disease area involving all secondary pits. The four apex of rhomboid was marked as A, B, C, D. C being adjacent to perianal skin little way from center as it becomes the site of recurrences. All angles were made of 60 degrees while creating a defect and flaps. A straight line was drawn from B to E going through the Point D. The length (D-E) was equal to length of A-B. New line was drawnbfrom E to F parallel and equal to D-C, which afterward was sutured to A-D (Figure 1). [4–8]. The diseased portion involved with in the rhombic portion was excised. The flap discussed above was raised with skin, subcutaneous fat and fascia overlying gluteal muscle to cover the rhomboid defect. Vacuum drain was placed, and deep fascia was opposed with absorbable suture without tension. Skin was sutured with prolene 2/0, 3/0 with vertical mattress and dressing was applied. Patients were given antibiotics, analgesic for infection control and pain management. Patients were discharged after 4 to 5 days or at their own request. Drain was removed once the drain output was less than 10 ml in last 24hours. All were kept in regular follow up and sutures were removed in 2 weeks duration time.

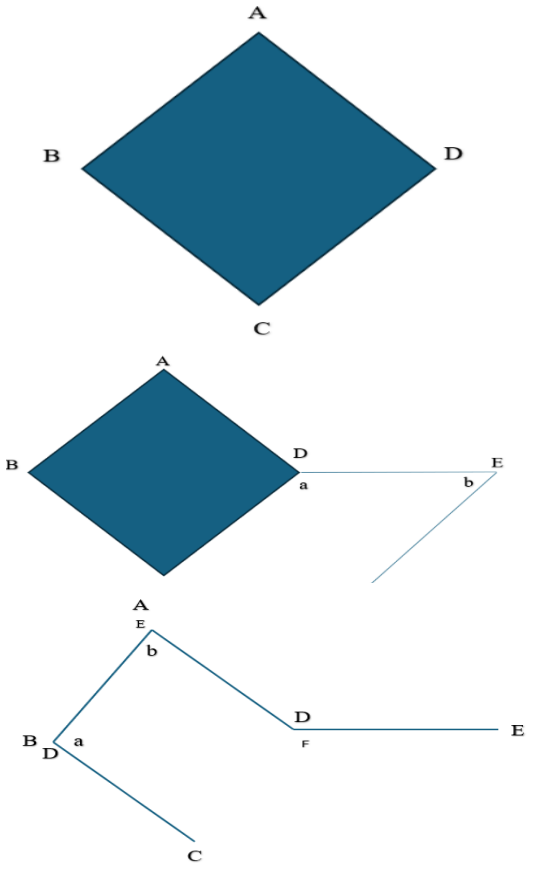


Figure 1. Mapping Scheme for Limberg Rhomboid flap

EPSiT Technique: As our institute doesn't have a Meinero fistuloscope, we used a nephroscope generally used in percutaneous nephrolithotomy, a Bugbee monopolar electrode(3mm) and an endoscopic grasping forceps. The nephroscope is equipped with an optical channel and a working and irrigation channel. It has a diameter of 30F, and an operative length of 24 cm. An angled handle allows easier maneuvering and better ergonomic for the surgeon. Pre-operative antibiotic prophylaxis was administered, and patients were placed in a prone position with buttocks separated apart with adhesive tape. The EPSiT was performed under spinal anesthesia as described in one of the past

study.[9] Once positioned the primary wound site was increased so that the nephroscope would pass easily. Through the wound initially curettage and extraction of hair tuft was performed then the working channel was introduced. For clear vision Glycine solution mixed with mannitol was irrigated sinus tract was visualized, remaining of the hair was extracted with help of grasper. Once cleared the whole sinus tract was cauterized by Bugbee electrode. At the end of surgery wash was done, drain placed and fixed. Routinely drain was removed on 2nd postoperative day and discharged. Patients surgical wound was taken care of with daily dressings. Postoperative hair removal was advised with shaving until the external opening healing was complete (Figure. 2).

Patients were clinically followed up on alternate days in surgical outpatient department for dressing for first 2 weeks then at 1,3, and 6, months after the procedure.

Data was analyzed using SPSS version 25.0. Descriptive statistics were performed, and results expressed as mean ± SD, frequency and percentage wherever applicable. P value ≤ 0.05 was considered statistically significant.

Figure 2. Key steps for EPSiT a. Identification of pilonidal disease b. Curettage and extraction hair tufts c. Insertion of working elements d. Removal of hairs in tract with direct visualization e. Cauterization of tract f. Placement of drain at end of surgery

RESULTS

This research involved 67 individuals diagnosed with pilonidal sinus. The participants' ages varied from 15 to 57 years, with a mean age of 23.61 years and a standard deviation of 6.87 years. Among the subjects, 49 (73.1%) were male, while 18 (26.9%) were female. The length of hospital stays for these patients ranged from 2 to 28 days, and the duration of the surgical procedures varied between 25 to 110 minutes, as detailed in Table 1.

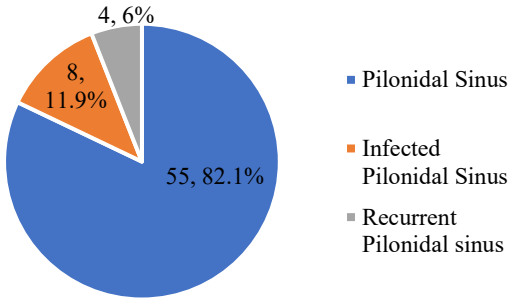
A significant portion of the study cohort, comprising 55 individuals, was diagnosed with pilonidal sinus, representing 82.1% of the total participants. In contrast, 8 participants, or 11.9%, were identified as having an infected pilonidal sinus. Additionally, recurrent pilonidal sinus was observed in 4 participants,

Table 1. Age, hospital stay and surgical duration (n=67)

Variables	Minimum	Maximum	Mean ± sd
Age	15	57	23.61±6.87
Hospital stays in days	2	28	4.31±3.46
Duration of Surgery	25	110	53.42±16.71

accounting for 6% of the study population (Figure 3)

Figure 3. Diagnosis of Study Participants (n=67)



A total of 31 patients (46.2%) underwent treatment with a rhomboid flap, while 30 patients (44.8%) were managed with EPSiT and excision followed by primary repair was performed in 6 patients (9%). Among the 67 patients studied, 50 individuals, representing 74.6%, experienced no complications, while 17 patients, accounting for 25.4%, encountered complications. The complications were surgical site infection, recurrence and dehiscence as presented in Table 2.

Table 2. Types of Complications (n=67)

Complications	Number	Percentage
Surgical site infection	11	16.4
Recurrence	5	7.5
Dehiscence	1	1.5

A total of 5 patients (7.04%) who underwent EPSiT developed surgical site infections, while 4 patients (4.63%) treated with a rhomboid flap and 2 patients (2.81%) who were managed with excision and primary repair also experienced surgical site infections. Additionally, recurrence was predominantly observed in patients treated with EPSiT, accounting for 3 cases (4.22%), and gaping was noted in 1 patient (1.41%) who underwent rhomboid flap surgery. However, the complications rate was comparable across various treatment modalities (p=0.98) (Table 3).

Table 3. Complications according to type of surgery (n=67)

Complications	EPSiT (n=30)	Rhomboid flap (n=31)	Excision with primary repair (n=6)	p value
Surgical site infection	5/7.46%	4/5.97%	2/2.98%	0.98
Recurrence	3/ 4.47%	1/1.49%	1/1.49%	
Gaping	0	1/1.49%	0	

The perioperative outcome in terms of duration of surgery, number of days spent in hospital and number of days in drain were comparable in all three forms of treatment modalities (Table 4).

Table 4. Duration of surgery and details of recovery (n=67)

Variables	EPSiT (n=30)	Rhomboid flap (n=31)	Excision with primary repair (n=6)	p value
Duration of surgery (min)	46.47±14.21	61.13±15.95	48.33±17.22	#0.00, *0.08
Range of surgical duration (min)	25-90	35-110	35-80	
Hospital stays (days)	2.27±0.52	6.06±4.32	4.50±1.37	#0.00, *0.00
Range of hospital stay (days)	2-4	3-28	2-6	
Duration of drain (days)	2.47±1.63	6.52±4.41	6.67±4.63	#0.00, *0.00
Range of duration of drain (days)	2-10	3-28	2-14	

EPSiT vs Rhomboid flap, * EPSiT vs Excision with primary repair

DISCUSSION

The findings of this research indicated that among patients diagnosed with pilonidal sinus and treated using one of the three approaches—excision with primary closure, endoscopic pilonidal sinus treatment (EPSiT), and rhomboid flap reconstruction—the perioperative outcomes, including length of hospital stay and number of days in drain was better with EPSiT when compared with excision with primary closure and rhomboid flap reconstruction. The surgical duration was longer in rhomboid flap surgery in comparison to EPSiT and excision with primary repair. The complications such as surgical site infections, recurrence, and wound dehiscence, was comparable between three treatment modalities. Pilonidal disease is a common problem in the sacrococcygeal region, especially in obese and sedentary hairy young men. The male: female ratio has shown diverse outcome in different study ranging from 1:1 to 2.2:1[10,11] Previous

research has indicated that males are more significantly affected by this disease compared to females.[2,3,12] This disparity may be attributed to the greater prevalence of body hair in males, a finding that aligns with our study, where 73.1% of the patients were male.

In recent years patients with pilonidal sinus want treatment with excellent cosmetic results, less morbidity, and rapid recovery for daily physical activities. As most of the patients are students or job holders these patients need early resumption of their daily routine activities.

Excision and central primary repair for pilonidal disease has shown higher recurrence rate as it may have tension in suture lines. However, in a hairy man the success rates can be limited by hair collection in midline natal cleft. Of 6 patients we had operated with excision with primary repair we had complication in 50%. Two of the patients had surgical site infection (SSI) which healed with dressing. One patient had a recurrence; same patient had undergone EPSiT 5months back and had recurrence. Though we had fewer cases of excision and primary repair, we had high complication rates. The complication seems high as the total number operated in this group is less with compared to other groups. However, there are studies with less complication and recurrences after excision and primary repair. [13–15]

Though multiple flap techniques have been tried like Karidakis flap, V-Y flap, multiple Z-plasty, and Rotational flap. Limberg rhomboid flap was introduced and accepted for its versatility and less complication and recurrence rates.[7,16] We had recurrence in 1 patient in rhomboid flap, 3 patients developed superficial SSI which healed with simple dressing. One patient had SSI with gapping who had to undergo secondary suturing. One female patient who was operated for recurrent pilonidal sinus stayed for 28 days as her drain output was high and didn't want to go home with attached drain. As per the results of recent studies complications and recurrences were low in our study as well. [17–20]It's assumed that male sex hormone has direct impact on development of pilonidal diseases. That is why it is mostly seen in second and third decade of life when the hormone production is high in male. In our study we had operated in 57 years male patient which differs the above statement or he might have sinus but not symptomatic for that time. In contradicting to other study, most of the patients in our study were not obese but were hairy at gluteal cleft area. In this study, we have compared three different commonly performed surgeries for pilonidal diseases. The number of patients in excision and primary repair was very low compared to Limberg flap and EPSiT. However, when comparing the complication and recurrence among the groups there was no significant difference. EPSiT brings a new dimension to surgical interventions, offering faster recovery and patient-friendly outcomes and most of all better cosmetic satisfaction. Of 30 patients who underwent EPSiT five had minimal discharge which might be the result of cautery done for the tract, that eventually healed in follow up with dressing only. Three patients had recurrence i.e., 4.47%, which is within the range of the studies done by other

authors.[21,22] The patients who had recurrence were managed Limberg rhomboid flap (1 case), excision and primary repair (1 case) and the third case went to another center for further management. The operative time for EPSiT was 46.47±14.21 minutes which was comparable to other studies.[21,22] Duration of hospitalization and drain placement was less than excision and rhomboid flap group. The complete wound was healed in a mean period of 30.4 days ranging from 21 days to 40 days, which when compared to other study are comparable to same time duration. Whereas there are studies where the mean wound healing postoperative was 19 days.[11]The early mean postoperative wound healing in this study might be associated with use of small 3mm telescope use, leading to small wound and tract.

There are several limitations of this study. Firstly, the number of cases is less. Secondly, we used a nephroscope instead of proper EPSiT equipment which created a bigger wound taking a longer time to heal. We asked the patient with EPSiT for more frequent follow up for inspection and dressing of wound than that of open technique, which in terms permit quick response management in expected complications. We have not studied the quality of life and time required to return to regular daily activities post procedure in different groups. As EPSiT is a minimal invasive surgery its outcome may be reflected by the expertise of the surgeons and numbers of surgeries performed. The studies should be performed including larger sample size with lengthier follow up period in multicentric form to support current findings.

CONCLUSIONS

Amongst the various treatment modalities including EPSiT, rhomboid flap reconstruction and excision with primary repair, the findings of our study showed that EPSiT was better in terms of reduced hospital stay and number of days in drain. The complications, however, were comparable in all three treatment methods.

CONFLICT OF INTEREST

None

SOURCES OF FUNDING

None

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