RESEARCH ARTICLE

Endoscopic pilonidal sinus treatment (EPSiT) for sacrococcygeal pilonidal sinus disease: A prospective long-term study

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Abstract

Objective: To assess short-term and long-term outcomes of endoscopic pilonidal sinus treatment for pilonidal sinus disease.

Method: The prospective study was conducted at Shifa International Hospital, Islamabad, Pakistan, from July 2015 to July 2021, and comprised all pilonidal sinus cases undergoing minimal invasive endoscopic pilonidal sinus treatment who were treated by a single surgical team. The primary outcomes were duration of healing, post-operative morbidities, persistence of discharge and recurrence at 1-7 years. The secondary outcomes were operative time, return to work, cosmetic results and patient satisfaction. The patients were observed for wound healing and discharge on follow-up in the out-patient department at 1, 3, 6 and 24 weeks. They were further followed up every year through telephonic survey for persistence or recurrence of symptoms. Patient satisfaction was assessed using the 36-item Short Form Survey questionnaire filled at admission and then at 6 weeks post-surgery. Data was analysed using SPSS 23.

R**esults:** Of the 67 patients, 55(82%) were males and 12(18%) were females. The overall mean age was 25.69±8.305 years. There were 13(19.4%) patients with a history of recurrent disease and previous procedures for pilonidal sinus, while 54(80.6%) had no previous surgery. The median operative time was 35 minutes (interquartile range: 20-45 minutes). Complete wound healing was achieved in 60(89.6%) patients, while recurrence was seen in 7(10.4%). The median time off work was 2.5 days (interquartile range: 1-3 days). Patient satisfaction with the procedure was significantly high ($p<0.05$).

Conclusion: Endoscopic pilonidal sinus treatment appeared to be a good minimally invasive surgical technique for the treatment of pilonidal sinus disease in terms of both short-term and long-term outcomes.

Keywords: Pilonidal sinus disease, Minimally invasive surgery, Endoscopic pilonidal sinus treatment, EPSiT, Recurrent pilonidal sinus. (JPMA 74: 1084; 2024) **DOI: https://doi.org/10.47391/JPMA.9948**

Introduction

Pilonidal sinus (PS) is a chronic disease mostly affecting natal cleft, occurring more commonly in hairy obese males with an incidence of 26/100,000 population worldwide.[1] The process involves collection of broken hair deposited in the inter-gluteal region, causing inflammation and abscess formation, and ultimately leading to single or multiple sinuses.[2] It is associated with sedentary occupation, local irritation with prolonged sitting, hirsutism, and obesity, and affects younger age groups.[3] Clinical presentation includes abscess, pits or chronic cyst formation, which may have a deep impact on quality of life (QOL), hindrance from work and school.[4] There are several surgical options for the treatment of this condition. Open surgical techniques include excision and healing by secondary intention, and offer poor post-operative QOL, frequent doctor visits and prolonged periods of recovery.[5] Closed excisions include simple midline closure after excision, Karydakis off midline closure, and various flap operations, such as Rhomboid's and Limberg's.[6] Such procedures are associated with the disadvantage of big scars, poor cosmetic results and significant rate of recurrence.[6,7] Hence, there was a need for an ideal procedure with minimal hospital stay, early return to work and good QOL post-operatively with acceptable recurrence rates. Meinero et al. proposed a minimally invasive procedure in 2013, called the endoscopic pilonidal sinus treatment (EPSiT), for treating PS with 95% healing rates in 27 days.[8] Various other minimal invasive techniques have since been described in literature, including laser ablation of tracks, curettage with phenol injections, fibrin glue, pit-picking and video-assisted ablation of pilonidal sinus (VAAPS), with encouraging results.[9,10] Still, there is a room and quest for the best minimal invasive technique with best cosmetic results, least post-operative complications, high patient satisfaction and quick long-term recovery.

The current study was planned to assess short-term and long-term outcomes of EPSiT in the treatment of PS disease.

Patients and Methods

The prospective study was conducted from July 2015 to July 2021 at the Department of Surgery, Shifa International

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Hospital, Islamabad, Pakistan, where EPSiT was introduced in 2015. The study was conducted after approval from the institutional ethics review committee, and it comprised all PS patients using non-probability consecutive sampling technique after taking written informed consent for the use of EPSiT.

The procedure, performed by a single surgical team, was varied out with a fistuloscope (Karl Storz, Southbridge, Massachusetts, United States) made for video-assisted anal fistula treatment (VAAFT).[11] The kit included a monopolar electrode connected to the ball electrode power unit, a Volkmann spoon, an endobrush, obturator and forceps.

All the procedures were carried out under general anaesthesia (GA) with the patient in prone position and gel pads placed below chest, pelvis and knees. Each operation began with a diagnostic step. After dilating the sinus opening with artery forceps, the fistuloscope was introduced through the appropriate external opening pit along with obturator. The sinus cavity and any lateral tracts were identified. During this step, the cavity of sinus and all tracts were cleaned by irrigation with glycine solution and all hairs and accompanying slough were taken out with forceps.

Once all the cavity and sinus tracts were cleared of hair, the walls of sinus cavity and tract were ablated by a monopolar electrode introduced through the operative channel. The tracts were further cleaned with endobrush and continuous jet of 1% glycine-mannitol, promoting irrigation and washout of debris. Finally, the monopolar electrode cautery probe was used again to ablate the tract and achieve haemostasis.

At the end of procedure, small circular rim of tissue around the sinus opening was excised for histopathology. If there were multiple sinus openings, they were curetted and a light dressing was applied at the end of the procedure. Every case was given per-operative antibiotic amoxicillin/clavilunate potassium 1.2gm at the time of induction of anaesthesia. Post-operatively patients were given paracetamol 1gm analgesia as per need. All patients were encouraged to mobilise as early as possible on the same day, and all were discharged within 24 hours. The patients were guided to keep the area clean with a small dressing for the first week, or till the cessation of any discharge.

Data regarding major complaints, location and number of sinuses, association with pain, presence of associated acute abscesses and previous procedure, if done, for the same PS disease, duration of surgery and post-operative pain on visual analogue scale (VAS)[12] score 1-10 were recorded. Post-operative complaints, wound healing and wound examination findings included wound discharge, development of granulation tissue, swelling, wound infection/abscess formation and bleeding. Wound infection as redness and/or swelling at the site of surgery with or without discharge was recorded.

The patients were observed on follow-up in the out-patient department (OPD) at 1, 3, 6 and 24 weeks. They were further followed up every year through telephonic survey for persistence or recurrence of symptoms for 1-7 years, depending on the year of the surgery during the study period. Wound healing, granulation tissue, discharge, pain, swelling and recurrence of symptoms in initial weeks, and, later, persistence or recurrence of symptoms were the elements noted. Recurrence was defined as discharging sinus developing after complete wound healing at 6 months. Patients who had persistent discharge were also included as recurrence cases. Patient satisfaction was assessed using the 36-item Short Form Survey (SF-36) questionnaire[13] filled at the time of admission for surgery, and at 6 weeks post-procedure. The scoring range was 0-100, and higher score indicated a more favourable health state.

Data was analysed using SPSS 23. Data was presented as frequencies and percentages, mean ± standard deviation, and median with interquartile range (IQR). Variables were compared using independent t-test and chi-square test, as appropriate. $P<0.05$ was considered significant.

Results

Of the 67 patients, 55(82%) were males and 12(18%) were females. The overall mean age was 25.69±8.305 years (range: 14-51 years). There were 13(19.4%) patients with a history of recurrent disease and previous procedures for PS, 54(80.6%) had no previous surgery, 62(92.6%) presented with a discharging sinus, 5(7.5%) presented with non-discharging sinus, 56(83.6%) had associated pain in the sinus tract, 5(7.5%) had concomitant diabetes mellitus, 1(1.8%) had a history of psoriasis, and 4(6%) had history of smoking. The median operative time was 35 minutes (IQR: 20-45 minutes). The median time off work was 2.5 days (IQR: 1-3 days), and 53(79.1%) patients returned to work in 2-4 days (Table 1).

There were 10(15%) patients who were followed up for 7 years, while 20(30%) were followed up for 1 year (Figure 1). Complete wound healing was achieved in 60(89.6%) patients, while recurrence was seen in 7(10.4%) (Figure 2). The location of sinus opening had no association with recurrence of symptoms (p=0.106). Post-operative complications were seen in 4(5.9%) patients, and 2(2.98%) developed abscess at the wound site at 8 weeks of the

procedure (Figure 2), which were drained and cavities were irrigated with normal saline. Both patients healed well without any evidence of recurrence later. Also, 2(2.98%) cases of persistent discharge at 6 weeks did not complete the study protocol and underwent excisional surgery on their own choice. These were counted as recurrent cases. The total recurrence at 1 year was 7(10.4%), and 2(2.9%) of them experienced persistent discharge at 5 years, but never got operated again.

Patient satisfaction was significantly high post-procedure for physical functioning, role limitation in physical health, role limitation in emotional health, fatigue and social functioning ($p<0.05$) (Figure 3).

Table-1: Patient characteristics (n=67).

Variables	n (%)
Gender	
Male	55 (82.1)
Female	12 (17.9)
Duration of symptoms	
<6months	32 (47.8)
6months-1 year	12 (17.9)
>1 year	23 (34.3)
Association with acute abscess	
Present	14 (20.9)
Absent	53 (79.1)
Location of sinus	
Both sides of midline	2 (3.0)
To the left of midline	15 (22.4)
Midline only	44 (65.7)
To the right of midline	6 (9.0)
History of previous surgery for PS	
Previously operated	13 (19.4)
Previously not operated	54 (80.6)
Type of previous surgery for PS	
Excision of pilonidal sinus	7 (10.4)
Incision and drainage	4 (6)
Rhomboid flap	1 (1.5)
Pre-operative culture	
Positive	19 (28.4)
Negative	48 (71.6)
Post-operative cultures	
Positive	7 (10.4)
Negative	28 (41.8)
Not done	32 (47.8)
Post-operative pain (VAS) Scale (1-10)	
1-2	51 (76.1)
3-5	12 (17.9)
6-8	4 (6)
9-10	0 (0)
Return to work/normal activities	
2-4 days	53 (79.1)
5-8 days	8 (11.9)
>8 days	6 (9)

PS: Pilonidal sinus, VAS: Visual analogue scale.

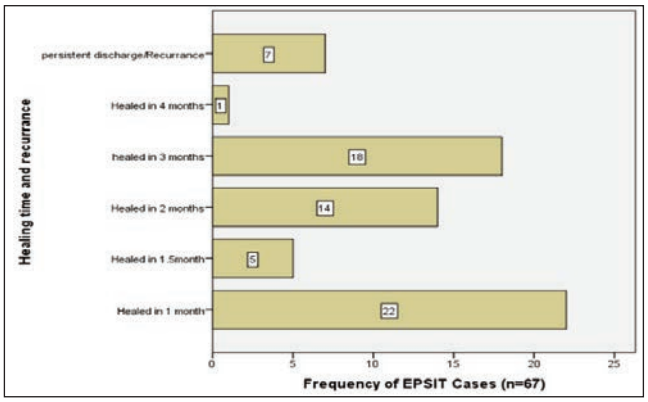

Figure-2: Telephonic follow-up of the patients (healing n=60; recurrence n=7).

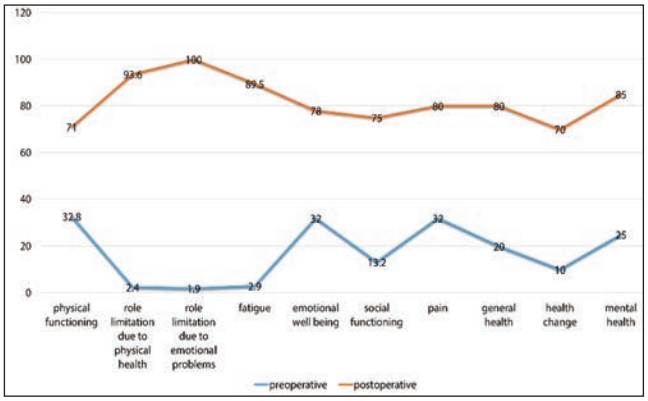

Figure-3: Difference in pre-operative and post-operative quality of life (QOL) assessed using 36-item Short Form (SF-36) questionnaire at 6 weeks.

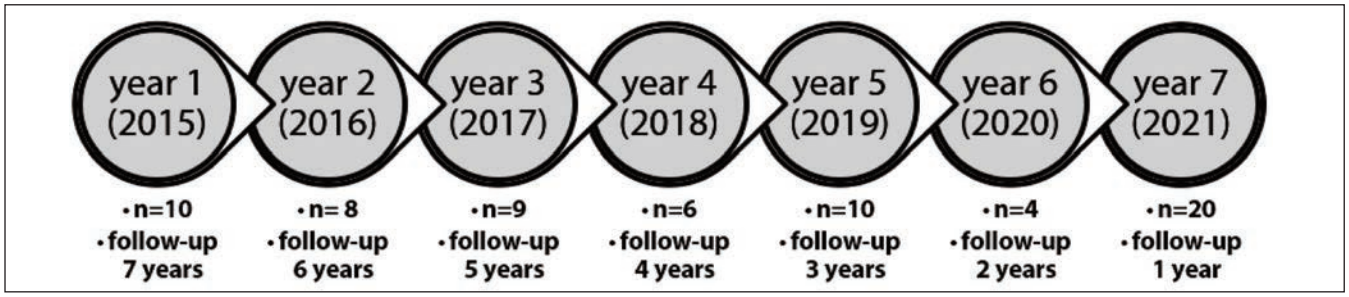

Figure-1: Patients enrolled and their annual follow-up from 2015 to 2021.

Table-2: Follow-up of endoscopic pilonidal sinus treatment (EPSiT) cases up to 24 weeks (n=67).

Examination findings	1 week n (%)	3 weeks n (%)	8 weeks n (%)	24 weeks n (%)
Healing wound with no discharge	23(34.3)	35(52.2)	55(82)	60(89.5)
Healing wound with minimal discharge	31(46.3)	20(29.8)	7(10.4)	5(7.4)
Healing with small amount of slough/ granulation tissue	11(16.4)	9(13.4)	1(1.4)	0(0)
Persistent Pain and mild swelling without any discharge wound	0(0)	1(1.4)	2(2.9)	0(0)
Persistent discharge from the wound/ abscess formation	2(2.9)	2(2.9)	2(2.9)	2(2.9)

Discussion

The current study found EPSiT comparable in many aspects to other minimally invasive as well as traditional techniques. Traditional procedures to achieve complete excision of the pilonidal sinus and secondary tracts lead to large wounds/scars, causing significant pain, immobility, burdensome wound care, and longer period off work.[11,14] EPSiT, like other minimally invasive techniques, has an advantage over conventional techniques; it can be performed as a day-care procedure. EPSiT is an adoption from VAAFT and is performed with the same instruments.[15]

Majority of the patients (61%) healed within 8 weeks with minimum complications (Figure 2). These are comparable with global data reporting healing time of 26 days and 6 weeks.[16,17] The requirement for analgesics remained very low with short hospital stay, early return to work and good cosmetic appearance in this study. Complete healing was achieved in 60(89.5%) patients by 24 weeks, which was lower than 95% reported by a study in 2019 using EPSiT.[18]

The median operative time of 35 minutes was comparable to other studies.[19-21]

The patients were advised to regularly wash the cavity to enhance healing and decrease the chances of recurrence.[22] There are different ways to describe results of treatment of PS disease. A study described the post-operative course in different categories for clarification.[2] The current study adopted similar definitions, labelling all cases of persistent discharge and recurrence as treatment failures. The treatment failure in 7 patients (5 recurrent and 2 persistent) was comparable to open as well as minimally invasive techniques.[1,5,23] One major difference, however, is short convalescence, early return to activities, good cosmetic results and patient satisfaction with EPSiT. The current study did not find any increase in the incidence of recurrence on long-term follow-up of 7 years for the cases that were enrolled and operated upon in 2015.

The 7-year follow-up is a distinguishing aspect of the study. Most studies with long-term follow-ups (5-15 years) reported increased rate of recurrence in all open and closed techniques.[23-25] A meta-analysis of older studies found 13% recurrence at 1 year after open excisions of PS, and 15% after closed excision.[26] A recent study found high recurrence rates.[27] It is possible that the rate of recurrence might increase with longer follow-ups due to the peculiar nature of the disease occurring in young adults who can continue to have the same risk factors for PS for up to 2 decades.[28]

The researchers intend to continue following the patients for 15 years to find out long-term results. However, immediate recovery with better cosmetic results should matter more than long-term risk of recurrence. In case of recurrence, a similar minimally invasive technique can help patients resume their work much earlier than other conventional procedures. Patients' preferences should be taken care of while considering treatment plans.[23]

Majority of the patients returned to work within a week after the operation (91%), and none required prolonged hospital stay. All these patients were taught to take self-care of the wound at home with scheduled follow-up visits to monitor the progress of healing. The resultant scar was minimal and cosmetically appealing. The return to activity takes a few weeks in conventional procedures.[2,3] The study performed tissue and pus cultures in all cases pre-operatively, and antibiotics were prescribed accordingly in positive culture cases. This could be another factor behind quick recovery and low recurrence in the cases.

There was a marked difference in pre-operative and post-operative QOL of the PS patients. The finding was similar to the findings reported earlier.[8,15]

The study has limitations. It did not compare the results with other techniques over the same time period. A randomised controlled trial (RCT) comparing various techniques was not feasible as patients, whenever given the option, would always opt for minimally invasive procedures. Another big limitation of the dataset was that all the procedures had been performed by the same team at a single centre. A multi-centre study could produce more meaningful data recruiting a large number of patients and following a standardised technique.

Conclusion

Within the study setting, EPSiT appeared to be a good minimally invasive surgical technique for sacral PS disease, leading to acceptable cure rates, minimal scarring and requirement of post-operative analgesia, quick post-operative mobility, good cosmetic results and comparable recurrence rates.

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Conflict of Interest: None.

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Author Contribution:

MA: Concept, design, data acquisition, analysis, interpretation, final approval.
FF: Concept, design, data acquisition, analysis, interpretation, Agreement to be accountable for all aspects of work.
SL, SK: Drafting and revision.
SA: Agreement to be accountable for all aspects of work.
MU: Concept, design, data acquisition, analysis, interpretation.