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COMPARISON OF ENDOSCOPIC PILONIDAL SINUS TREATMENT (EPSIT)WITH KARYDAKI'S PROCEDURE IN THE MANAGEMENT OF PILONIDAL SINUS

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Abstract

Background: *Pilonidal sinus disease (PD) commonly affects young adults and often requires surgery. The Karydakis procedure and Endoscopic Pilonidal Sinus Treatment (EPSiT) are two common techniques. Differences in hospital stay and recurrence rates between them remain clinically important. Comparing these can aid in selecting the optimal treatment.*

Objective: *To compare the outcomes of Karydakis procedure and Endoscopic Pilonidal Sinus Treatment (EPSiT) in terms of hospital stay and recurrence rate in patients with pilonidal sinus disease (PD).*

Methods: *This randomized controlled trial was conducted in the Department of Surgery at Services Hospital, Lahore, over a period of six months (September 1, 2024 to March 1, 2025). Using non-probability successive sampling and randomly allocated into Group A (Karydakis procedure) and Group B (EPSiT), a total of 92 patients with clinically and radiologically verified pilonidal sinus were enrolled: 46 individuals each. There was only one surgical team handling all of the operations. We noted postoperative results including hospital stays and recurrences. While recurrence was clinically and radiologically evaluated at three months, hospital stay was computed from the day of operation till release. SPSS v21 was used for data analysis; chi-square test was used for recurrence; Mann-Whitney U test for hospital stay. A p-value ≤ 0.05 was considered statistically significant.*

Results: *Between both groups, baseline parameters like age, gender, and illness duration were comparable ($p > 0.05$). The mean hospital stay in the EPSiT group (3.19 ± 1.51 days) was much less than in the Karydakis group (6.72 ± 2.14 days) ($p < 0.001$). With a $p = 0.002$, the recurrence rate was much greater in the Karydakis group (28.3%) than in the EPSiT group (4.3%). Stratified analysis revealed notably greater recurrence with Karydakis in men (35.5% vs. 3.4%, $p = 0.002$), patients aged 16–30 years (34.4% vs. 3.1%, $p = 0.002$), and in those with illness duration ≥6 months (26.5% vs. 2.7%, $p = 0.004$).*

Conclusion: *With much reduced hospital stay and decreased recurrence rates, EPSiT proved better than the Karydakis technique. These results help to justify the use of EPSiT as a less invasive, successful substitute for pilonidal sinus disease surgical treatment.*

INTRODUCTION

Pilonidal sinus is a prevalent inflammatory condition marked by a channel or small opening in the intergluteal cleft. It may lead to complications such as infection and the formation of abscesses.[1] Pilonidal originates from the Latin terms "pilus," signifying "hair," and "nidus," denoting "nest." The phrase "pilonidal disease" was introduced by R.M. Hodges in 1880. The prevalence of pilonidal sinus is 26 occurrences per 100,000 persons.[2] It is more prevalent among males. Despite being a benign condition, treatment may sometimes be challenging. There are many surgical options; nonetheless, the best approach remains arguable.[3]

Designed by Greek surgeon Dr. George Karydakis, the Karydiki technique consists of an elliptical excision around the afflicted region, orientated laterally to one side of the natal cleft. The surgery aims at the fundamental mechanisms of the disease. Consistent low recurrence rate defines a simple asymmetric method defined by the Karydakis technique. It does, however, have a learning curve and is connected to dissection, which increases post-operative pain and prolongs healing times. Meinero et al. first presented EPSiT, an endoscopic technique for treating pilonidal sinus disease, in 2014. The surgery involves cutting hair from the tract and then cauterising the cavity under endoscopic visualisation using a fistuloscope coupled with a working and irrigation channel. It helps guide vision and is less intrusive. Along with better cosmetic results than traditional open techniques, EPSiT claims benefits in post-operative pain control, accelerated recovery, and fast wound healing.[4]

Few studies have compared Karydiki's approach with the EPSit. Results of such studies have been conflicting.[5] We searched the extensive body of literature and found just one similar local study done. Thus, our efforts might help to analyze the two modes in a local environment and improve future decision-making.

Mean hospital stay of 5 days was found among patients with sacro-coccygeal pilonidal sinus disease who had Karydakis flap surgery between January 2001 and December 2010.[6] For pilonidal sinus, conventional surgery had a mean hospital stay of 2.6 ± 1.7 days while endoscopic surgery had 0.8 ± 0.4 days. Recurrence rates for open surgery were 23.4% and for endoscopic surgery were 5.4% in a study spanning up to nine months.[7] A 2008 study including 55 patients who had open surgery for pilonidal sinus reported a mean pain intensity score of 4.8 out of 10 [8], while a 2021 research with 46 individuals suggested a postoperative pain score of 2 out of 10.[9]

The aim of our study is to compare endoscopic pilonidal sinus treatment in comparison to Karydakis procedure in terms of post-operative pain, hospital stay and short term recurrence in patients undergoing intervention for pilonidal sinus disease.

Material and Methods

Study Design: Randomized Control Trial

Setting: Conducted in Department of Surgery, Services Hospital, Lahore.

Duration of Study:

6 months after approval of synopsis (September 1, 2024 till March 1, 2025)

Sample Size:

A sample size of 92 (46 in each groups) is calculated taking 5% level of significance, 80% power of study and taking % of recurrence as 23.4% vs 5.4% for open vs enoscopic pilonidal surgery. [7]

Sampling technique:

Non- Probability Consecutive Sampling Technique

Sample Selection

Inclusion Criteria:

- Both genders, patients with all ages who present with complains of inter-natal cleft pits was evaluated. Physical examination and sinogram was carried out in all cases. Cases determined to have positive physical and radiological examination for

pilonidal sinus were included in the study after informed consent.

Exclusion Criteria:

- Patients with uncontrolled Diabetes (BSR > 200 mg/dl)
- Patients with history of tuberculosis
- Patients with history of radiation use
- Patients with history of steroid use
- Patients with immunocompromised status or immune-suppressant use

Data Collection Procedure: After Ethical approval from the hospital ethical committee 92 patients fulfilling the selection criteria were enrolled from surgical wards. Informed consent was taken. Demographics (name, age, gender and duration of symptoms) were noted. Then patients were examined for pilonidal sinus. Pilonidal sinus was diagnosed through both clinical and radiological evaluation. Clinically, the condition was identified by the presence of midline pits located within the inter-gluteal cleft. Radiologically, a sonogram was employed to delineate the blind-ending tract characteristic of the sinus. Patients were categorized in 2 groups by means of lottery method. Group A patients underwent Karydakis procedure while group B patients will undergo EPSiT. All procedures were done by a single surgical team.

In group A patients undergoing Karydaki's procedure, after induction of general anesthesia patients were moved to prone position. A dye along with methylene blue is injected to outline the tract and diseased portion. Elliptical incision was made around the pilonidal sinus and then the wound closed in such a way that the final closed wound lies to one side of the midline. A drain shall be placed in all cases which shall be removed on the 2nd post-operative day. In Group B patients undergoing EPSiT after induction of general anesthesia was moved to a lateral position. Glycerine solution is used for irrigation to enable distension and visualization of the tract. With the means of specialized instruments and fistuloscpe the tract was visualized. With means of brush inserted via the working channel, the tract shall be cleared of hair. Followed by cauterization of the tract to enable delayed healing.

After completion of both procedures' local anesthesia (bupivacaine 50 ml diluted with 50 cc normal saline) shall be infiltrated in and around the operative site. After recovery from anesthesia the patients were shifted to ward.

The study outcomes were assessed based on two main parameters: hospital stay and recurrence. Hospital stay was defined as the number of days the patient remained admitted post-operatively, with the day of the procedure considered as Day 0. Patients were discharged once they were tolerating oral intake and reported a pain score of less than 5 on the Visual Analogue Scale (VAS). Recurrence was assessed at three months post-operation. Initially, this was evaluated via physical examination, and any suspicion of recurrence—indicated by the presence of pits—was further confirmed through sinogram imaging. The working hypothesis of the study was that the EPSiT procedure would be associated with a shorter hospital stay and a lower recurrence rate compared to the Karydakis procedure in the surgical management of pilonidal sinus. All this information was recorded on proforma. All the collected data was entered and analyzed using SPSS version 21. Quantitative variables, i.e. age, duration of stay and duration of disease was presented as mean ±S.D while gender, recurrence was presented as frequency and percentage. and rate of wound recurrence. Both groups were compared wound recurrence by using chi-square test and hospital stay by using Mann Whiteny U test (as data was not normal). P-value ≤ 0.05 was taken as significant. Data was stratified for age, gender and duration of disease. Respective tests of significance were used post-stratification.

RESULTS

The mean age of patients in the Karydakis group was 27.33 ± 6.60 years with a median of 26.50 (IQR: 10.25), while the EPSiT group had a slightly lower mean age of 26.50 ± 6.50 years and a median of 24.00 (IQR: 11.25); however, this difference was not statistically significant (p = 0.509). Gender distribution was also same in both groups, as out of a total of 92 participants, 60 (65.2%) were male and 32 (34.8%) were female. In the Karydakis group, 31 (67.4%) were male and 15 (32.6%) were female, while in the EPSiT group, 29 (63.0%) were male and 17 (37.0%) were female, p-value > 0.05. Similarly, the

duration of disease showed no significant difference between the groups, with Karydakis patients reporting 10.43 ± 5.56 months (median: 10.0, IQR: 10.25) and EPSiT patients 10.98 ± 5.19 months (median: 11.0, IQR: 10.0) (p = 0.608). **Table-1.** A statistically significant difference was observed in the length of hospital stay, where the Karydakis group had a longer duration (6.72 ± 2.14 days; median: 7.0, IQR: 2.50) compared to the EPSiT group (3.19 ± 1.51 days; median: 3.0, IQR: 3.0) (p < 0.001). Subgroup analyses by age group, gender, and disease duration consistently showed longer hospital stays in the Karydakis group, though none of these comparisons were statistically significant (p > 0.05 across all stratified comparisons). **Table-1**

The recurrence was significantly higher in the Karydakis group, with 13 patients (28.3%) experiencing recurrence compared to only 2 patients (4.3%) in the EPSiT group (χ^2 = 9.64, p = 0.002). **Table- 2** Among patients aged 16–30 years, recurrence was significantly more common in the Karydakis group (11/32, 34.4%) than in the EPSiT group (1/32, 3.1%) (χ^2 = 10.26, p = 0.001). No significant difference was observed in the 31–40 age group (p = 0.541). Gender-based analysis showed a significantly higher recurrence in males undergoing the Karydakis procedure (11/31, 35.5%) compared to those treated with EPSiT (1/29, 3.4%) (χ^2 = 9.61, p = 0.002), while the difference among females was not statistically significant (p = 0.471). Regarding disease duration, patients with ≥6 months of disease had a significantly higher recurrence in the Karydakis group (9/34, 26.5%) compared to EPSiT (1/37, 2.7%) (χ^2 = 8.27, p = 0.004). No significant difference was observed among patients with <6 months duration (p = 0.237).

Table -3

Table-1: Comparison of demographic and clinical outcomes in both groups and stratified analysis

			Mean± S.D	Median± IQR	p-value
Age(years)		**Karydakis (n=46)**	27.33±6.60	26.50±10.25	0.509
		EPSiT (n=46)	26.50±6.50	24.0±11.25	
Duration of disease (months)		**Karydakis (n=46)**	10.43±5.56	10.0±10.25	0.608
		EPSiT (n=46)	10.98±5.19	11.0±10.0	
Hospital stay (days)		**Karydakis (n=46)**	6.72±2.14	7.0±2.50	<0.001*
		EPSiT (n=46)	3.19±1.51	3.0±3.0	
Hospital stay (days)					
Age group (year)	16-30	**Karydakis (n=32)**	6.46 ± 2.24	7 ± 3.75	0.711
		EPSiT (n=32)	3.28 ± 1.53	3.5 ± 3	
	31-40	**Karydakis (n=14)**	7.29 ± 1.81	8 ± 1.50	0.769
		EPSiT (n=14)	3 ± 1.52	3 ± 3.25	
Gender	Male	**Karydakis (n=31)**	6.97 ± 2.02	8 ± 3	0.965
		EPSiT (n=29)	3.24 ± 1.43	3 ± 2	
	Female	**Karydakis (n=15)**	6.20 ± 2.34	7 ± 4	0.350
		EPSiT (n=17)	3.12 ± 1.69	3 ± 4	
Duration of disease (months)	< 6	**Karydakis (n=12)**	6.08 ± 2.84	7.50 ± 4.75	0.862
		EPSiT (n=9)	3 ± 1.41	3 ± 2.50	
	≥6	**Karydakis (n=34)**	6.94 ± 1.82	7 ± 3	0.995
		EPSiT (n=37)	3.24 ± 1.55	3 ± 3	

**Highly Significant

Table-2: Comparison of Recurrences at 3 month with respect to both study groups

Recurrences at 3 month	Groups		Chi-square	p-value
	Karydaki's	EPSiT		
Yes	13(28.3%)	2(4.3%)	9.64	0.002
No	33(71.7%)	44(95.7%)		

Table-3: Comparison of Recurrences at 3 month in both study groups with other effect modifiers

		Recurrences at 3 month	Groups		Chi-square	p-value
			Karydaki's	EPSiT		
Age group (year)	16-30	Yes	11(34.4%)	1(3.1%)	10.26	0.001*
		No	21(65.6%)	31(96.9%)		
	31-40	Yes	2(14.3%)	1(7.1%)	0.37	0.541
		No	12(85.7%)	13(92.9%)		
Gender	Male	Yes	11(35.5%)	1(3.4%)	9.611	0.002*
		No	20(64.5%)	28(96.6%)		
	Female	Yes	2(13.3%)	1(5.9%)	0.521	0.471
		No	13(86.7%)	16(94.1%)		
Duration of disease (months)	< 6 months	Yes	4(33.3%)	1(11.1%)	1.400	0.237
		No	8(66.7%)	8(88.9%)		
	6 months or more	Yes	9(26.5%)	1(2.7%)	8.272	0.004*
		No	25(73.5%)	36(97.3%)		

*Significant

Discussion

Often seen in the natal cleft, a pilonidal cyst is a commonly occurring inflammatory lesion of the soft tissues. Though benign, the condition is complicated and treatment choices are not standardized yet under debate [10]. Many surgical techniques have been proposed; nonetheless, the best treatment is debatable, especially in recurrent cases [11]. In this context, our study compared two common surgical approaches: the traditional Karydakis flap and the minimally invasive EPSiT (Endoscopic Pilonidal Sinus Treatment), focusing on hospital stay, recurrence, and subgroup outcomes.

In our study, the average age of patients in both the Karydakis and EPSiT groups was around 26–27 years which is consistent with the known epidemiology of pilonidal disease that mostly affects young people, particularly males. This is according to the statistics given by Ergenç M, et al. (2023), which showed a notable male predominance and the disease mostly affects people aged 15 to 30 years [12].

Patients who had the Karydakis procedure stayed longer in our study—average 6.72 ± 2.14 days—than those treated with EPSiT—average 3.19 ± 1.51 days. This difference's statistical relevance ($p < 0.001$) emphasizes EPSiT's less intrusive qualities as well as its ability to encourage faster patient recovery and discharge. These findings confirm other studies demonstrating the benefits of less intrusive treatments in lowering hospitalization times. With a mean hospital stay of about, a prospective multicenter study found that EPSiT helped to enable a faster return to everyday activities. This is consistent with previous published data, including a retrospective research comparing EPSiT to open surgical procedures from 2002 to 2022, which suggested a somewhat shorter hospital stay for the EPSiT group (0.8 ± 0.4 days) compared to the open procedure group (2.6 ± 1.7 days, $p < 0.01$. Moreover, the operative length was

shortened in the EPSiT cohort (42.8 ± 17.4 min) as opposed to the open cohort (58.6 ± 23.7 min), therefore attesting to the procedural efficiency of EPSiT [13]. Other studies revealed short hospital stays, quick return to work or education, and most patients are able to resume their activities two days after surgery [14].

Our study showed that the recurrence rate was significantly higher in the Karydakis group, with 13 patients (28.3%) experiencing recurrence, compared to only 2 patients (4.3%) in the EPSiT group (p = 0.002). Recurrence was more common in the Karydakis group (34.4%) in patients between the ages of 16 and 30 years than in the EPSiT group (3.1%) (p = 0.001). Male patients undergoing the Karydakis procedure showed a higher recurrence rate (35.5%) than those treated with EPSiT (3.4%). (p = 0.002). These results coincide with the present studies stressing the efficiency of EPSiT in lowering recurrence rates. Recurrence rates of 7.1% in the EPSiT group and 26.6% in the Karydakis group were reported by local study comparing EPSiT with the Karydakis flap procedure [15]. Recurrence rates of 23.4% in the open surgery group compared to 5.4% in the EPSiT cohort (p = 0.03) were found by a similar retrospective study, therefore confirming the long-term benefit of EPSiT in lowering disease relapse [13]. These results coincide with those of a randomized controlled research conducted by Meinero et al., which followed 145 patients with chronic, non-recurrent pilonidal sinus over a five-year period. In that study, patients who had minimally invasive (VAAPS) experienced higher joy, improved cosmetic outcomes, and much lower overall treatment costs. Although the long-term recurrence rates for standard treatments were similar [16].

Moreover, on controlled clinical trials comparing endoscopic therapy with conventional treatment for pilonidal sinus disease, a meta-analysis was done. Derived from six included research, this analysis showed that endoscopic pilonidal sinus treatment significantly lower overall complication rate (risk ratio = 0.33, P =.0001) and drastically lower postoperative discomfort (WMD = −2.44, P =.002). Though the rates of recurrence for endoscopic and conventional treatments were not significantly different (P =.55), the advantages of lower morbidity and faster return of daily activities were very evident. These facts support the view that, as an endoscopic operation, EPSiT offers different benefits in terms of less discomfort, faster recovery, and reduced incidence of complications [17].

Recurrence was much higher in patients with a symptom history of ≥6 months in the Karydakis group (26.5%) than in EPSiT (2.7%, p = 0.004) in the analysis of illness duration. Those with fewer than six months of illness showed no significant variation in recurrence, indicating that early management with EPSiT may be especially helpful. The main benefit of EPSiT is its use for either complex or recurrent pilonidal sinus problems. With a low re-recurrence incidence of 5.1% and a complete healing rate of 95% a prospective multicenter study of 122 individuals with recurrent or multi-recurrent PD showed. Importantly, patients started normal activities on the first postoperative day and showed much better quality of life—from 45.3 to 7.9; p < 0.0001 [18]. The results confirm that EPSiT performs well in both simple and complex recurring circumstances, therefore offering improved short- and long-term results compared with traditional open techniques.

Karydakis is a widely utilized method because to its simple design and reasonable cost, but its drawbacks—including increased recurrence rates and extended hospitalization—need a review of its standing as the accepted technique. On the other hand, EPSiT offers several benefits that fit modern ideas of minimally invasive surgery: less postoperative pain, shorter hospital stays, better cosmetic outcomes, and far lower recurrence rates. EPSiT has a learning curve, hence equipment availability might limit its applicability in settings with minimal resources. Comprehensive assessment of its efficacy in avoiding recurrence depends on extended follow-up beyond a year.

Conclusion

EPSiT is a better surgical method than the Karydakis operation for pilonidal sinus disease because it offers much shorter hospital stays and reduced recurrence rates. In appropriate therapeutic circumstances, EPSiT should be regarded as a preferable choice based on its minimally invasive character and excellent clinical results.

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