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ASSESSING THE LONG-TERM OUTCOMES OF FLAP AND PIT-PICKING TECHNIQUES IN TREATING THE PRIMARY PILONIDAL SINUS DISEASE IN SERVICES HOSPITAL LAHORE

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Abstract:
Objective: It is yet uncertain what the best course of treatment for Pilonidal Sinus Disease (PSD), a common inflammatory condition of the natal fissure which leads to complications, especially in children, is. Our goal was to provide long-term PSD surgery outcomes.
Methods: Between May 2018 and April 2023, 146 patients who had their first surgery at Services Hospital Lahore for pilonidal sinus disease (PSD) underwent our review of their medical data. Out of these patients, 113 underwent either asymmetrical excision with local flap (AELF) or mini-invasive pit-picking surgery (PSS). Examining the outcomes of both of these groups was the major goal.
Results: Comparing patients with pelvic floor dysfunction who received minimally invasive posterior pelvic floor repair (PPS) to those who underwent abdominal sacrocolpopexy (AELF), PPS patients had a greater success rate with day surgery, fewer postoperative problems, and shorter sick leave. However, at the initial postoperative follow-up appointment, the healing rates for both techniques were comparable. With a recurrence rate of 50.9% compared to 10.3% for AELF, a long-term follow-up after around 9.3 years revealed that the recurrence rate after PPS was much greater than after AELF. This shows that although PPS could be advantageous in the near term, recurrence rates are greater compared to AELF over the long run.
Conclusions: Despite the elevated likelihood of occurrences in our study, PPS, a minimally invasive surgical technique frequently carried out under local anesthesia, is an appropriate choice for treating primary PSD, keeping in consideration that patient selection is a crucial factor to take into account. PPS may be beneficial for primary PSD with straightforward sinus forms. However, despite the startlingly slow recovery in our study, primary PSD with complicated sinus structures might gain from AELF. PSD is a highly diverse illness, and individuals have distinct risk factors, thus the surgeon must be skilled in a variety of surgical procedures. It is necessary to develop a categorization system to help surgeons choose the best surgical approach for each patient.

Keywords: pit picking, flap technique, pilonidal disease

Introduction:

Pilonidal sinus disease (PSD) mostly affects young people and most often develops in the follicles that produce hair of the primordial fissure of the sacrococcygeal region [1]. Over the years, there has been an increase in incidence. The mean number of PSD hospitalized sessions per 100,000 male patients grew from 43 to 56 from 2005 to 2017
whereas it climbed from 14 in 2005 to 18 in 2017 for female patients [2]. The percentage of female patients with PSD accounts for around 20% of all patients, with the male-to-female ratio staying stable over time [3]. Although PSD is a benign condition, people may still experience pain, suffering, difficulty attending work or

school, and a decrease in their quality of life as a result. complications following surgery such as infections and prolonged nonhealing wounds are also prevalent, and relapse is common [4]. Following midline closure, there was a 10.4% infection rate and a 6.3% infection rate, according to one systematic review [1]. According to the surgical approach, five-year recurrence rates varied from 10.2% to 21.9% in another meta-analysis [5].

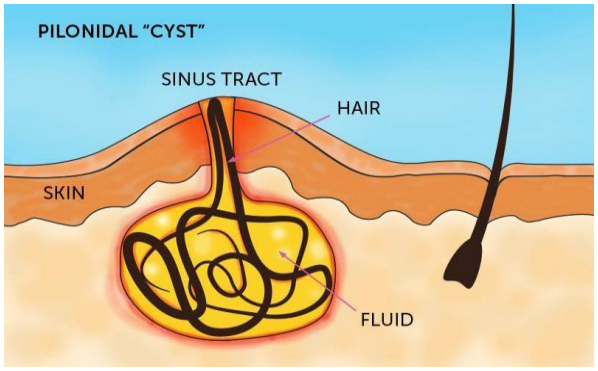

Figure 1: Pilonidal Sinus Disease

Regarding the ideal PSD treatment approach, there is no universal agreement [6]. PSD is a highly diverse disease category that includes chronic as well as acute symptoms, simple and complicated sinus forms, and primary and recurring illnesses, which restricts the application of any one therapeutic strategy [6].
Excision of the whole affected skin and subcutaneous tissue is one of several different surgical procedures [7]. This is preceded by either closure of the wound or open-wound surgery [8], the latter of which may be paired with NPWT to speed up the healing process [9].
When compared to the outcomes of conventional excisions and flap-reconstruction techniques, minimally invasive techniques are typically thought to be associated with less time in the hospital, decreased complications after surgery, and a faster return to regular routines [10].Evaluation of long-term recovery rates and complications is challenging due to the short follow-up periods after these various surgical methods. In one meta-analysis of long-term PSD surgical outcomes (mean follow-up duration, 58– 240 months), the incidence of relapsing illness was found to be 13.8% on average (weighted). There was a wide variety of surgical techniques included in that meta-analysis, and when they were combined into larger groups, the frequency of recurrence was as follows: After open wound surgery, the following rates were 17.9%, 16.8%, and 10%: mid-line closure and off-midline closure. Another research with a median follow-up of 11 years (range, 3–22 years) found an 8.9% recurrence risk for primary and recurrent PSD after an asymmetrical resection with primary closure. [11]

Methods:
At the Services Hospital Lahore, 146 patients' medical records who underwent primary surgery for chronic PSD as the primary condition were examined. The information was gathered between May 2018 and April 2023. There were 113 people in total since we only included patients who had undergone surgery utilizing the Bascom cleft lift, pit-picking, or Karydakis procedures (Figure 2). After surgery, medical records were retained for an average of 9.3 years (range: 5.4 to 10.6). Eight experienced surgeons at the consultant level, together with three residents—medical students pursuing surgical training—operated on each patient. Each surgeon was allowed to choose the operation that would be most beneficial for each patient. A minimum of one follow-up following surgery visit was made by every patient one to two weeks after surgery; further visits were made if the wound didn't heal (median 2 weeks, range 1-55 weeks).

Statistical Analysis: The primary objectives of this research were to look at postoperative complications and PSD recurrence. The time between surgery and the first recurrence was used tocalculate recurrence-free survival (RFS). Patients who had no recurrence were followed up with until the final follow-up appointment. To determine the parameters that led to RFS, the surgical approach, AELF vs PPS, as well as patient and procedure characteristics, were analyzed using univariable Cox proportional hazard models. Results were presented using hazard ratios and their 95% confidence intervals (CI). (Table 2) RFS was compared between PPS and AELF procedures using the log-rank test and Kaplan- Meier survival analysis, as well as RFS percentages

after 2, 5, and 10 years after surgery. No patients were missed for follow-up prior to the deadline,

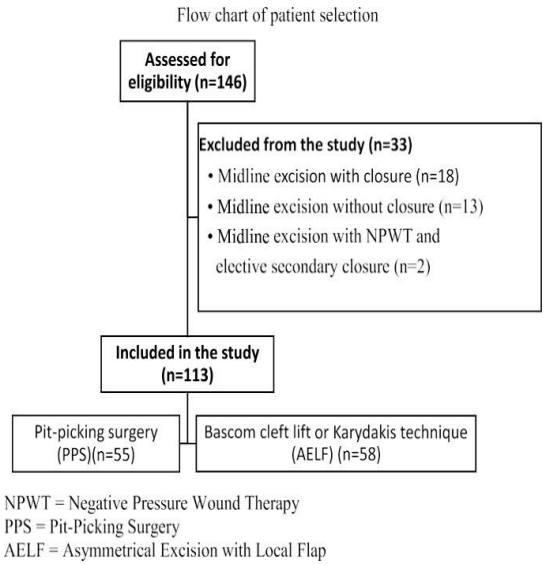

Figure 2: Patients' selection flow chart

In Table 3, odds ratios (OR) and their 95% confidence intervals for variables associated with postoperative complications were calculated using univariable logistic regression models. The features of the patient and the procedure, as well as the surgical method, were examined.
Multivariable models were not developed since the surgical method was the sole meaningful predictor of the key outcomes. Secondary outcomes included the length of sick leave, how well day surgeries worked, and how quickly wounds heal. These results were examined using the Mann-Whitney U-which was calculated from the time of the procedure till then.
test and Pearson chi-squared test, where necessary. For continuous variables, the median (range) was given, while categorical data were expressed as frequency (%). When determining statistical significance, SPSS version 28.0 used a two-sided p-value cutoff of 0.05 to define statistical significance.

Results:
Retrospective research was done on 113 patients who had PSD surgery, 77% of them were men and had an average age of 26. (Table 1) The information gathered included the following topics: patient characteristics, surgical methods used, pus leakage during surgery, the number of sinus pits, recurrence and recurrence time, postoperative problems, sick leave length, the effectiveness of surgery day, and follow-up healing.34 recurrences (30.1%) were found after examination of the data, which was done at a median of 9.3 years and a median period of 4 months after surgery.
In this research, the Bascom cleft lift operation (AELF) and primary midline closure (PPS) were compared. The research revealed that the PPS patients were younger than the AELF patients, but there was no statistically significant difference in diabetes, gender, BMI smoking habits, or history of abscess incision between the two groups. Although there were more sinus pits and pus spills with the AELF technique, the difference was not statistically significant. (Table 1)

Table1: Demographics of the study population

	AELF				**PPS**				**All**				**p**
Characteristics	n	%	Average	Range	n	%	Average	Range	n	%	Average	Age	
Age			28	16-66			24	16-59			26	16-66	0.03
BMI			29.1	21.6-44.1			28.3	17.9-44.5			28.4	17.9-44.5	0.29
Gender													
Female	13	22.4			13	23.6			26	23			
Male	45	77.6			42	76.4			87	77			0.88
Smoking													
No	8	23.5			13	39.4			21	31.3			
Yes	26	76.5			20	60.6			46	68.7			0.16
Diabetes													
No	53	91.4			53	96.4			106	93.8			
Yes	5	8.6			2	3.6			7	6.2			0.27
Sinus number													
≥ 2	33	82.5			41	75.9			74	78.7			
< 2	7	17.5			13	24.1			20	21.3			0.44
Previous abscess incision													
No	26	45.6			25	45.5			51	45.5			
Yes	31	54.4			30	54.5			61	54.5			0.99
Pus leakage during surgery													
No	50	86.2			53	96.4			103	91.2			
Yes	8	13.8			2	3.6			10	8.8			0.06

53% of PPS patients were still free of recurrence after 2 years, and 49% were still free at 5 and 10 years, according to a study of recurrence-free survival done 2, 5, and 10 years following surgery. In Figure 3 In contrast, after 2 years, 93% of AELF patients were still free of recurrence, and at 5 and 10 years, 90% were still free of recurrence. As a result, the PPS patients' probability of recurrence was 6.65 times greater than that of the AELF patients. No further statistically significant risk variables for recurrence were discovered by the research. (Table 2)

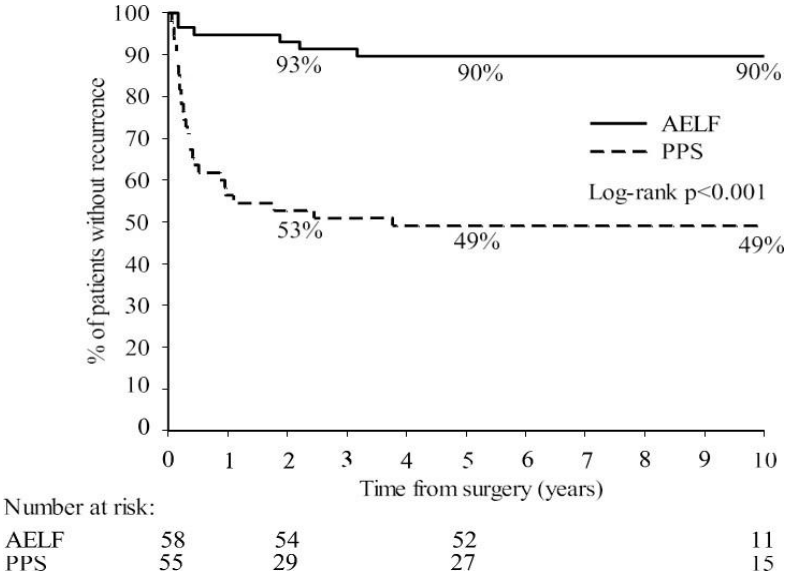

Figure 3: Kaplan–Meier curves

Table 2: Patient characteristics and pilonidal surgical characteristics to forecast recurrence-free survival

Predictors	**N**	**HR (95% CI)**	**p**
Surgery			
PPS	55	6.65 (2.75–16.10)	< 0.001
AELF	58		
Gender			
female	26	1.14 (0.53–2.44)	0.74
male	87		
Age (years)			
≥ 26	60	0.55 (0.28–1.08)	0.08
< 26	53		
BMI			
≥ 25	44	3.22 (0.75–13.82)	0.12
< 25	13		
Smoking			
Yes	46	0.78 (0.33–1.83)	0.57
No	21		
Diabetes			
Yes	7	0.88 (0.21–3.66)	0.86
No	106		
Sinus number			
≥ 2	74	1.25 (0.52–3.05)	0.62
< 2	20		
Previous abscess incision			
Yes	61	1.05 (0.53–2.07)	0.89
No	51		
Pus leakage during surgery			
Yes	10	0.61 (0.15–2.53)	0.49
No	103		

According to the examination of postoperative complications, infections, bleeding, hematomas, and seromas occurred in 9.4% of PPS patients and 36.2% of AELF patients. Infections, hemorrhage, hematomas, and seromas also occurred in 9.4% of PPS patients. Postoperative problems were less common for PPS patients than for AELF patients. According to the study, individuals who were obese or overweight, diabetic, smokers, or all of these conditions had a greater likelihood of postoperative complications. The surgical method was the

only statistically significant risk factor for complications, however. (Table 3)

Table 3: Features of the patient and the pilonidal operation to forecast postoperative problems

	n (%)	**OR (95% CI)**	**p**
Surgery			
PPS	5/53 (9.4)		
AELF	21/58 (36.2)	0.18 (0.06–0.53)	0.002
Gender			
Female	6/26 (23.1)		
Male	20/85 (23.5)	0.98 (0.34–2.76)	0.96
Age (years)			
≥ 26	14/59 (23.7)		
< 26	12/52 (23.1)	1.04 (0.43–2.50)	0.94
BMI			
≥ 25	13/44 (29.5)		
< 25	0/11 (0)	4.61c (0.54–39.49)	0.16
Smoking			
Yes	14/46 (30.4)		
No	2/19 (10.5)	3.72 (0.76–18.31)	0.11
Diabetes			
Yes	4/7 (57.1)		
No	22/104 (21.2)	4.97 (1.03–23.87)	0.05
Sinus number			
≥ 2	16/73 (21.9)		
< 2	45065 (26.3)	0.79 (0.25–2.51)	0.68
Previous abscess incision			
Yes	11/60 (18.3)		
No	15/50 (30)	0.52 (0.21–1.28)	0.15
Pus leakage during surgery			
Yes	44936 (10)		
No	25/101 (24.8)	0.34 (0.04–2.80)	0.31

According to the study, PPS had a lower percentage of sick leave and a higher success rate for day surgeries than AELF. There was no difference in the healing rates between the two groups at the postoperative check-up appointment. Over the extensive follow-up, the PPS patients had a higher recurrence rate than the AELF patients. The research revealed that, while producing greater postoperative problems, the AELF approach had a

lower recurrence rate than the PPS technique (Table 4). According to the research, people who are overweight or obese, have diabetes, or smoke may be more likely to have postoperative problems. The success rate of day surgeries and the length of sick leave were shown to be better with PPS. The research emphasizes how critical it is to choose the best surgical method for PSD surgery depending on the features of the patient and unique risk factors.

Table 4: Postoperative outcomes for PSD surgery patients

	AELF			PPS			All			p
	n	%	Range	n	%	Range	n	%	Range	
Sick Leave Length										< 0.001
Median	21		13-161	14		7-114	14		7-161	
Missing values	24			9			33			
Day surgery's success	19/58	32.8		52/55	94.5		71/113	62.8		< 0.001
Following the appointment, the wound had healed	43/56	76.8		39/52	75		82/108	75.9		0.83

Discussions:

Our extensive research found a statistically significant difference between PPS and AELF's recurrence rates. At 10 years, 49% of PPS patients had not experienced a recurrence, compared to 90% of AELF patients. Within four years of follow-up, recurrences developed in both groups. Patients with PPS had a greater probability of recurrence than those with AELF, however, the numbers were nearly the reverse in terms of postoperative recovery. Patients who had PPS had a greater day surgery success rate and needed less time off work to recuperate. Nevertheless, both procedures displayed comparable rates of healing at the post- operative follow-up appointment.

Minimally invasive surgical methods often result in quicker recovery after surgery and fewer problems than more conventional methods, according to the surgical literature [12]. However, follow-up periods in PSD studies are frequently brief, and we were only able to locate a small number of studies [13,14] that were centered on surgical procedures comparable to those in our study and had a more than 5 years follow-ups. The Bascom II method exhibited a recurrence rate of 23.8% after five years [15]. The recurrence rate for the Karydakis surgery varied between 8.8% and 11.0% in two studies, one [30] with a median follow-up of 11 years and the other [16] with a median follow-up of 33 months. An earlier study that used a surgical procedure somewhat like our AELF technique—D-shape asymmetric excision [17]—reported an 8.9% recurrence rate with a median follow-up of 11 years. The subsequent recurrence rates observed in these studies are in line with our recurrence rate of 10.3% after long-term AELF surgical follow-up.

The substantial long-term recurrence rate of PPS may be due in part to the procedure's mini- invasiveness. Smaller channels may not be found or cleansed, leaving behind residues in the skin and subcutaneous adipose tissue that might serve as a possible source of recurring sickness. Larger sinus tracts are cleansed but only partially removed in PPS. Our nearly 10-year follow-up period may be another factor. Although 75% of recurrences happen within 5 years of surgery, they can happen up to 20 years later [18,19].

There are many established risk factors for complications in PSD surgery, including obesity, diabetes, smoking, pus leakage after surgery, and the number of sinuses [20]. Obesity, smoking, the age at which pus leaks after surgery, and the quantity of sinuses, however, none of these risk variables approached statistical significance in our research. This lack of statistical significance maybe explained by the substantial amount of missing data for the patients' BMI, smoking status, and sinus numbers. The fact that there were only 113 patients in total may have prevented the statistical significance of the risk factor for pus leaking during surgery.

Conclusions:

Despite a high risk of recurrence, primary paranasal sinus surgery (PPS) can be a less invasive option for treating primary paranasal sinus disease (PSD) in simple sinus forms if patient preference is taken into consideration. PPS may not work, however, for complicated sinus structures. The more intrusive anterior ethmoidal artery ligation and fenestration (AELF) approach, however, may be beneficial for large PSD with complicated sinus shapes even if it may not be appropriate for simple sinus forms. Surgeons need be skilled in a variety of surgical techniques due to the many risk factors and presentations of PSD, and a classification system may be useful in determining the best course of action for each patient.

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