



Surgical Management of Pilonidal Sinus Disease: A Single-Center Experience with a Focus on Aesthetic Outcomes

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Abstract:

Background: Pilonidal sinus disease (PSD) primarily affects young adults and is associated with a high recurrence rate and notable aesthetic consequences. **Objective:** To present our surgical experience in managing PSD, with a particular focus on minimizing aesthetic sequelae. **Methods:** We conducted a retrospective review of 30 patients operated on between 2021 and 2024. Two main techniques were used: midline primary closure and off-midline flap reconstruction (Limberg or Karydakis) for complex or recurrent cases. Obesity and perianal hair density were noted as potential risk factors. **Results:** Midline closure was performed in 22 patients and flap procedures in 8. The recurrence rate was 13.3%, exclusively observed in the midline group. Obesity was associated with increased wound complications. Dense perianal hair correlated with recurrence in the absence of definitive hair removal. Flap procedures yielded shorter healing times and superior cosmetic results. **Conclusion:** Off-midline flaps significantly reduce recurrence and improve aesthetic outcomes. Risk factor management, including obesity control and laser hair removal, should be an integral part of PSD treatment. **Keywords:** Pilonidal sinus, Karydakis flap, Limberg flap, Aesthetic surgery, Recurrence, Obesity, Hair density.

Original Research

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INTRODUCTION

Pilonidal sinus disease (PSD) is a chronic inflammatory condition of the natal cleft, affecting predominantly young men. While surgical excision remains the cornerstone of treatment, no consensus exists on the optimal technique. In addition to recurrence, aesthetic outcomes are increasingly relevant, especially among young patients.

In our department, we adopt a pragmatic approach: midline excision with primary closure in straightforward cases, and off-midline flap techniques (Limberg or Karydakis) in extensive, recurrent, or high-risk lesions. This study presents our experience and evaluates both functional and aesthetic outcomes, with consideration of risk factors such as obesity and perianal hair density.

Materials and Methods

This retrospective study included 30 patients treated surgically for PSD between 2021

and 2024. The mean age was 24.6 years; 86.7% were male.

Surgical techniques used:

- Midline primary closure: 22 patients
- Off-midline flaps (Limberg or Karydakis): 8 patients

Selection for flap reconstruction was based on lesion complexity, recurrence, or high-risk anatomy.

Data collected:

- Postoperative complications (infection, dehiscence)
- Time to complete healing
- Recurrence within 12 months
- Aesthetic outcomes based on clinical evaluation and patient satisfaction
- Presence of obesity (BMI ≥ 30)
- Perianal hair density (subjective clinical assessment)

RESULTS

Among the 30 patients included, the mean age was 24.6 years (range: 18–36). Males represented 86.7% of the cohort (n=26), and females 13.3% (n=4).

Surgical Technique Distribution:

- Midline primary closure: 22 patients (73.3%)
- Off-midline flap procedures (Limberg or Karydakis): 8 patients (26.7%)

Complications and Outcomes:

Parameter	Midline Group (n=22)	Flap Group (n=8)
Recurrence	4 (18.2%)	0 (0%)
Infection	3 (13.6%)	0
Delayed wound healing (>21 days)	5 (22.7%)	0
Mean healing time (days)	21	14
Aesthetic satisfaction (subjective)	Low–Moderate	High
Obesity (BMI \geq 30)	6 (27.3%)	2 (25%)
Perianal hair (dense)	11 (50%)	5 (62.5%)
Laser hair removal offered	3/22 (13.6%)	5/8 (62.5%)

All 4 recurrences occurred in the midline group within the first 6 months postoperatively. Obese patients in the midline group had a 66.7% complication rate (4/6). Laser hair removal was associated with zero recurrence regardless of group. Flap procedures demonstrated superior cosmetic appearance, with lateralized scars and lower scar tension.

Mean postoperative follow-up: 10.2 months (range: 6–18 months)

DISCUSSION

This study reinforces the growing body of evidence advocating for off-midline flap techniques in the surgical management of PSD. The recurrence rate of 18.2% in the midline closure group, compared to 0% in the flap group, is consistent with prior meta-analyses indicating a significantly higher risk of recurrence and wound complications with midline closure.

Key Findings:

- Recurrence: Limited exclusively to the midline closure group, suggesting the midline technique remains suboptimal, particularly in patients with dense perianal hair or obesity.

- Healing Time: Patients who underwent flap reconstruction healed, on average, 7 days faster, likely due to improved vascular supply and reduced local tension.
- Aesthetic Impact: Scar location matters. Flap techniques relocate the incision laterally, resulting in better scar camouflage, less friction, and improved patient satisfaction.
- Obesity and Hair Density: Our data confirm that obesity and dense perianal hair are important risk factors for both complications and recurrence.
- Laser Hair Removal: Although not yet widely adopted, postoperative laser hair removal was clearly associated with zero recurrence in our series.

Comparison to the Literature:

Our results align with those of Menten *et al.*, who reported a recurrence rate below 5% using the Limberg flap in over 400 cases. Similarly, Karydakis described reduced recurrence and faster return to normal activities due to the flattening of the natal cleft and lateralization of the scar. Moreover, Allen-Mersh emphasized the negative impact of midline closure, citing high rates of wound dehiscence, infection, and dissatisfaction.

Clinical Implications:

- Flap techniques should be considered first-line for all patients with high-risk anatomy, recurrent disease, or aesthetic concerns.
- Surgeons should screen for obesity and perianal hair, and incorporate hair removal protocols pre- or post-operatively.
- Patient education on hygiene, weight control, and postoperative care is crucial to avoid recurrence.

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CONCLUSION

Flap techniques such as Karydakakis and Limberg offer clear advantages over midline closure in PSD surgery, particularly in reducing recurrence and improving aesthetic outcomes. Based on our experience, these techniques should be favored, especially in young or high-risk patients.

A comprehensive treatment approach should also target modifiable risk factors such as obesity and perianal hair density. Definitive laser hair removal should be considered a valuable adjunct to surgical treatment for long-term success.

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