

A Comparative Study of Various Surgical Methods for Sacrococcygeal Pilonidal Disease at a Tertiary Care Hospital in India

S Lakkanna, K Aditi, S Vaishnavi

¹Professor and HOD, Department of general surgery, ESIC medical college and PGIMSR and Model hospital, Rajajinagar, Bangalore, ²Senior Resident, Department of general surgery, ESIC medical college and PGIMSR and Model hospital, Rajajinagar, Bangalore, ³Intern, Department of general surgery, ESIC medical college and PGIMSR and Model hospital, Rajajinagar, Bangalore

Abstract

Introduction: Pilonidal sinus disease is a very common anorectal problem without a clinical consensus on its optimal management.

Objective: The objective of this study was to compare the surgical methods used in our hospital and determine the outcomes in relation to hospitalization time, healing, post-operative complications and recurrence.

Materials and Methods: All patients with pilonidal sinus disease that was treated surgically at our hospital between January 2014 and March 2018 were considered.

Results: A total of 74 patients of whom 57 were male and 17 females. 12 were treated with simple excision, 25 with simple excision and closure, 26 with Limberg's flap, and 11 with Karydakias flap. Duration of surgery and duration of hospital stay were significantly larger for the flap procedures. Complications such as infection (11.5%) and seroma (24.5%) were common with flap procedures. Recurrence was common with simple excision with or without closure (82%) compared to flap procedures (24.5%).

Conclusion: The two flap techniques show no difference among each other.

Key words: Pilonidal sinus, Flap techniques, Recurrence, Follow up

INTRODUCTION

The term pilonidal sinus originates from pilus Latin for hair (plural pili), nest from nidus. Sinus is a blind tract from an epithelial surface, lined by granulation tissue. The etiology and pathogenesis of sacrococcygeal pilonidal sinus are not clear.^[1,2] The pathogenesis of the disease is hypothesized to be related to the accumulation of weak and lifeless hair in the intergluteal region, which overtime gives rise to foreign body reaction, causing abscess, and sinus formation.^[3,4]

Pilonidal disease can appear as an acute abscess along with sinus tract formation. A more complex manifestation can be characterized by chronic or recurrent abscesses with

extensive, branching sinus tracts. The common form is an acute abscess characterized by the existence of a midline pit in the natal cleft typically identified 4–8 cm from the anus. The skin enters the sinus giving the opening a smooth edge. This primary tract leads into a subcutaneous cavity, which contains granulation tissue and usually a nest of hairs that are present in two-thirds of cases in men and in one-third of those in women and may be seen projecting from the skin opening. Many patients have secondary lateral openings 2–5 cm above the midline pit. The skin opening and the superficial portion of the tract are lined with squamous cell epithelium, but the deep cavity and its extensions are not.

The risk factors of pilonidal disease are young age, obesity, increased sacrococcygeal subcutaneous fat thickness, ingrown hair, depth and narrowness of natal cleft, driving/sitting for >4 h/day, positive family history, and taking bath <3 times/week.

A deep natal cleft with one of favorable factors enhance sacrococcygeal pilonidal sinus, for example, sweating,

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Corresponding Author: K Aditi, Senior Resident, Department of general surgery, ESIC medical college and PGIMSR and Model hospital, Rajajinagar, Bangalore

maceration, bacterial contamination, and penetration of hairs. Obesity, trauma, local irritation, and a sedentary lifestyle are usually associated with pilonidal sinus.^[5,6] Although pilonidal sinus can be treated using various conservative and surgical methods, recurrence rate remains high. Complete surgical removal of the pilonidal sinus or sinuses and appropriate reconstruction can lead to successful recovery.^[7-9] However, collection of the lifeless hair depends on the anatomy of the intergluteal area, and accompanying risk factors can lead to subsequent recurrence.^[10-13]

This paper presents the outcome of 74 patients operated at our hospital. There are very few studies with long follow-up period.

MATERIALS AND METHODS

It is a retrospective study. It was done in the department of general surgery. All patients with sacrococcygeal pilonidal sinus disease operated between January 2014 and April 2018 were considered in the study.

The variables included are age, sex, method of surgery, time of hospitalization, duration of follow-up, and recurrence.

The surgery was done by various surgeons in the different surgical units and the surgical procedure was chosen by the surgeon based on the procedure of their choice and after taking informed consent from the patients. All the patients were explained regarding both the procedures, and the risks and benefits associated with them.

Surgical Procedure

Surgery was done under spinal anesthesia and in prone position. Injection ceftriaxone 1 g intravenous was given while parts were painted just before the incision. Both buttocks were retracted laterally using adhesive tapes.

- Simple excision – The sinus tract along with surrounding skin margin of 5 mm was excised and allowed to heal by secondary intention.
- Excision with primary closure – An elliptical incision was made around the sinus, wash was given to the wound and closed primarily using non-absorbable sutures.
- Limberg's flap procedure – A rectangular (rhomboid) tissue of full thickness, skin and subcutaneous fat is excised including the midline with its long axis in the midline. Angles of rhomboid should be 60 and 120° and are adjusted as shown in the pictures. Flaps are elevated, rotated, and sutured using 3-0 polypropylene. Suction drain is placed underneath. Skin is closed with polyethylene.

- Karydak's primary excision and closure – The excision is performed using an asymmetrical incision which deliberately removes much more skin on one side than the other. The pits in the presacral cavity are excised, the side of the excision closest to the midline is undermined so that when the skin is approximated to the other side (the wider skin excision area) the wound lies off-center.^[14]

RESULTS

The demographic details are shown in Table 1.

A total of 74 patients with Sacrococcygeal pilonidal sinus disease who underwent surgery between 2014 and 2018 at our institute were studied. The average age (in years) was 26. Male to female ratio was 10:3. The type of sinus i.e primary: primary + secondary was 5:2.

12 patients of total 74 underwent simple excision, 25 underwent excision with primary closure, 26 underwent limberg's flap and 11 underwent karydaki's flap procedure (Table 2). The recurrence rate in simple excision was 50%, in simple excision with closure was 32%, limberg's flap procedure was 15.4% and karydaki's flap procedure was 9.1% (Table 3). Total number of patients with primary pilonidal disease were 63 and total number of patients with recurrent pilonidal disease were 11. Total number of patients who had surgery for pilonidal sinus twice in the past were 2.

Coming to the post operative complications, it was found that flap techniques had more complications compared to the simple procedures as shown in Table 4. Duration of surgery and duration of hospital stay was longer in flap techniques compared with simple procedures and statistically significant (Table 5)

DISCUSSION

The ideal method of the treatment of pilonidal sinus would be one with minimal tissue loss, minimal post-operative morbidity, excellent cosmetic results, rapid resumption of daily activities, low cost, and a low recurrence rate.^[15] However, although numerous operative treatment methods have been described, no treatment comprises all of these features.^[16]

Table 1: Summary of patients and procedures (range)

Average age (years)	26 (19–33)
Male-to-female ratio	10:3
Mean duration of disease before surgery-	6 to 8 months
Type of sinus (primary: primary+secondary)	5:2

Horwood *et al.*^[17] systematically reviewed, by two independent investigators, six relevant randomized controlled trials for pilonidal disease regarding primary suture/repair and Limberg's flap. A total of 641 patients were included in this systematic review. This literature supports the use of rhomboid flap excision and the Limberg's flap repair procedures over primary midline suture techniques for the elective management of primary pilonidal disease, but further high-quality studies are necessary to support this. The points of strength of this paper are being belonged to Level 1 as a systematic review of randomized trials or n-of-1 trials according to the latest oxford level of evidence and the randomized trials with poor methodology were excluded.

Tavassoli *et al.*^[18] performed excision with primary repair as Group 1 and rhomboid excision with the Limberg's flap as

Group 2. The demographic characteristics of their patients, early and late complications, comfort and pain score on the 1st and the 4th post-operative day, hospital stay, time of return to work, and patient satisfaction were compared. There was no significant difference between the two groups in terms of demographic characteristics, operation time, early complication rate, and recurrence. However, significant difference was observed in return to work, first pain-free toilet sitting, pain score, and patient satisfaction. The authors concluded that the Limberg's flap has similar complications as the primary repair method, but earlier return to work and less hospital stay, lower pain score and higher comfort, and satisfaction were the advantages of the Limberg's flap method. Thus, this method is recommended for the treatment of primary pilonidal disease. The relatively smaller number of patients was a weak point of this paper; otherwise, the results were well tabulated and the probability values of significant were traced.

Roshdy *et al.*^[19] performed rhomboid flap versus primary closure after excision of sacrococcygeal pilonidal sinus as prospective randomized study in 140 patients. The authors stated that goal for the treatment of pilonidal disease in 2-fold, the first is excising and healing with low rate of recurrence; the second is minimizing patient inconvenience and morbidity after surgical procedure. In conclusion, the excision and rhomboid flap is better than excision and

Table 2: Surgery type distribution of patients studied

Surgery type	Gender		Total (%)
	Female (%)	Male (%)	
Simple excision	3 (17.7)	9 (1.8)	12 (5.4)
Excision with primary closure	7 (41.2)	18 (45.6)	25 (44.6)
Limberg's	4 (23.5)	22 (38.6)	26 (35.1)
Karydakis	3 (17.6)	8 (14)	11 (14.9)
Total	17 (100)	57 (100)	74 (100)

Table 3: Recurrence

Recurrence	Surgery type				Total (n=74)
	Simple excision (n=12)	Simple excision with closure (n=24)	Limberg's (n=26)	Karydakis (n=11)	
No (%)	6 (50)	17 (68)	22 (84.6)	10 (90.9)	55 (74.3)
Yes (%)	6 (50)	8 (32)	4 (15.4)	1 (9.1)	19 (25.7)

Table 4: Post-operative complications

Post-operative complications	Surgery type				Total
	Simple excision (%)	Simple excision with closure (%)	Limberg's (%)	Karydakis (%)	
Seroma	0 (0)	0 (0)	4 (15.4)	1 (9.1)	5 (6.8)
Infection	1 (12.5)	0 (0)	3 (11.5)	0 (0)	4 (5.4)
Superficial wound dehiscence	1 (12.5)	0 (0)	0 (0)	1 (9.1)	2 (2.7)
Partial necrosis	0 (0)	0 (0)	0 (0)	1 (9.1)	1 (1.4)
Nil	10 (75)	25 (100)	19 (73.1)	8 (72.7)	62 (83.8)
Total	12 (100)	25 (100)	26 (100)	11 (100)	74 (100)

Table 5: Comparison of clinical variables according to surgical type of patients studied

Duration	Surgery type				Total	p-value
	Simple excision	Simple excision with closure	Limberg's	Karydakis		
Duration of surgery (min)	31.25±8.35	34.80±10.36	46.73±10.76	46.27±16.4	31.25±8.35	<0.001**
Duration of hospital stay (days)	7.88±3.40	6.60±2.04	8.92±3.52	10.45±4.87	7.88±3.40	<0.001**

primary repair in the treatment of pilonidal disease because it flattens the natal cleft avoid dead space, healing time is short, morbidity is low, shorter hospital stay, and low rate of recurrence. In this paper, the sample size was satisfying, the results were well written and well tabulated, and the probability values of significant were traced.

Points of the strength of this paper were the sample size and the operating surgeons.

This study was limited by the smaller sample size which was considered a weak point of this paper.

CONCLUSION

The ideal procedure for treating pilonidal sinus disease is not clear, but complete excision of the affected areas, flattening of the natal cleft, avoiding midline scars, and a tension free repair of the wound with well vascularized tissue appear to be essential features of any treatment for this disease. It is now clearly showed better patients' satisfaction with wound closure primarily or using flaps after surgery rather than leaving it open. For simple non-recurrent pilonidal sinus, less invasive surgery with limited excision and primary closure could be enough. Different flap techniques showed no significant difference among each other. However, the advantages of Karydakis cleft lift flap in recurrent and complicated cases are noticeable in different studies, although wound complication is similar to other flap methods.

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