International Surgery Journal
Madhusudhan A et al. Int Surg J. 2017 Nov;4(11):3641-3645
http://www.ijsurgery.com
pISSN 2349-3305 | eISSN 2349-2902

DOI: http://dx.doi.org/10.18203/2349-2902.isj20174878

Original Research Article

Pilonidal sinus- limberg versus karidakis flap our experience at SIMS, Shivamogga

Madhusudhan A., Madhan D. P. Swamy*, Mohammad Arif

Department of General Surgery, Shimoga Institute of Medical Sciences, Shivamogga, Karnataka, India

Received: 13 August 2017
Accepted: 21 September 2017

***Correspondence:**
Dr. Madhan D. P. Swamy,
E-mail: madhan13051989@gmail.com

ABSTRACT

Background: The etiology and pathogenesis of sacro-coccygeal pilonidal sinus are not clear. The pathogenesis of the disease is hypothesized to be related to the accumulation of weak and lifeless hair in the intergluteal region, which over time gives rise to foreign body reaction, causing abscess and sinus formation. A deep natal cleft with one of favourable factors enhance sacro-coccygeal pilonidal sinus, e.g., sweating, maceration, bacterial contamination and penetration of hairs. Obesity, trauma, local irritation and a sedentary lifestyle are usually associated with PS. 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. However, collection of the lifeless hair depends on the anatomy of the intergluteal area, and accompanying risk factors can lead to subsequent recurrence.
Methods: The objective of this study is to compare the immediate post-operative and long-term results of Limberg flap and Karydakis flap, which are being widely used now to treat pilonidal sinus disease. It was a retrospective observational study where the patients (total number of patients-30) who underwent both the procedures were compared, Limberg flap (LF; n = 13) and Karydakis flap (KF; n = 17).
Results: Present study found out that short and long-term results of the LF and KF procedures are similar. In present study we also noted that all patients with pilonidal sinus disease were men, and most of them had jobs which involved sitting for long durations. Poor hygiene and hirsutism however was not noted in most of the patients, and was not objectively assessed.
Conclusions: Both the techniques can be used safely and effectively in sacro coccygeal pilonidal sinus disease.

Keywords: Karidakis flap, Limberg flap, Pilonidal sinus

INTRODUCTION

The term pilonidal sinus originates from-pilus; latin for hair (pleural-pilli), nest from nidus. Sinus is a blind tract from an epithelial surface, lined by granulation tissue. The etiology and pathogenesis of sacro-coccygeal 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 over time gives rise to foreign body reaction, causing abscess and sinus formation.[3,4]

A deep natal cleft with one of favourable factors enhance sacro-coccygeal pilonidal sinus, e.g., sweating, maceration, bacterial contamination and penetration of hairs. Obesity, trauma, local irritation and a sedentary lifestyle are usually associated with PS.[5,6] Although, pilonidal sinus can be treated using various conservative

and surgical methods, recurrence rate remain 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]

METHODS

This study was a retrospective study, and was carried out in the general surgery department, Shimoga institute of medical sciences(SIMS), Shivamogga. Ethical clearance was obtained from the ethical committee of SIMS, Shivamogga. Patients with diabetes mellitus, immunodeficiency, neurological disorder, drug addiction, alcoholism, ASA 3-4, those who are under 17 and over 60, and those whose orifice was located away more than 3cm were excluded.

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 with sulbactam 1.5gm was given I.V while parts were painted just before the incision. Both buttocks were retracted laterally using adhesive tapes.

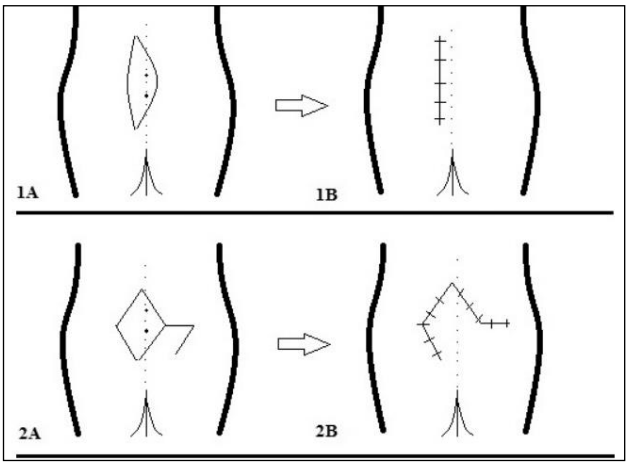

Figure 1: Karydakis (1A, 1B) and Limberg (2A, 2B) flap techniques.

Karydakis flap (KF):- In this technique, an asymmetrical elliptic excision was done, lower and upper ends being located at approximately 2 cm lateral to the natal cleft, and all defective tissues were removed until reaching to the healthy borders.[14-16]

Statistical methods[17-20]

Study design: an observation clinical study. Descriptive and inferential statistical analysis has been carried out in the present study. Results on continuous measurements are presented on Mean±SD (Min-Max) and results on categorical measurements are presented in number (%). Significance is assessed at 5 % level of significance. Chi-square/Fisher exact test has been used to find the significance of study parameters on categorical scale between two or more groups, non-parametric setting for qualitative data analysis. The statistical software namely SPSS 18.0, and R environment ver.3.2.2 were used for the analysis of the data. Significance limit of statistics was set at $P < 0.05$.

RESULTS

Mean age of the patients studied was 40.23±11.20, most of the patients were in the age group of 30-50years. All of the patients studied were males. 56.7% of the patients under went karidakis procedure, 43.3% of the patients underwent limberg's procedure.

Table 1: Age distribution of patients studied.

Age in years	No. of patients	%
<20	1	3.3
20-30	5	16.7
31-40	11	36.7
41-50	9	30.0
>50	4	13.3
Total	30	100.0

Mean±SD: 40.23±11.20.

In present study 20% (6) patients had surgical site infection severe enough to warrant removal of sutures (partial removal) to drain the seroma, of these 4 belonged to the karidakis flap group. 23.5% of the karidakis flap group had significant SSI compared to 14.4% of the limberg flap group.

Table 2: Gender distribution of patients studied.

Gender	No. of patients	%
Male	30	100.0
Female	0	0.0
Total	30	100.0

Table 3: Procedure distribution of patients studied.

Procedure	No. of patients	%
Karidakis flap	17	56.7
Limberg flap	13	43.3
Total	30	100.0

Complete flap necrosis was not seen in any of the patients, however partial flap necrosis primarily

involving the suture line was noted in 10% (3) of the cases, 2 of these patients belonged to the limberg's flap category. 15.4% of limberg flap group had partial flap necrosis compared to 5.9% in case of karidakis flap.

Table 4: Age distribution of patients studied.

Age in years	Procedure		Total
	Karidakis flap	Limberg flap	
<20	1 (5.9%)	0 (0%)	1 (3.3%)
20-30	3 (17.6%)	2 (15.4%)	5 (16.7%)
31-40	5 (29.4%)	6 (46.2%)	11 (36.7%)
41-50	6 (35.3%)	3 (23.1%)	9 (30%)
>50	2 (11.8%)	2 (15.4%)	4 (13.3%)
Total	17 (100%)	13 (100%)	30 (100%)

P=0.908, Not significant, Fisher Exact test.

Table 5: Gender distribution of patients studied.

Gender	Procedure		Total
	Karidakis flap	Limberg flap	
Male	17 (100%)	13 (100%)	30 (100%)
Female	0 (0%)	0 (0%)	0 (0%)
Total	17 (100%)	13 (100%)	30 (100%)

Table 6: SSI distribution in relation to procedure of patients studied.

SSI	Procedure		Total
	Karidakis flap	Limberg flap	
Absent	13 (76.5%)	11 (84.6%)	24 (80%)
Seroma	4 (23.5%)	2 (15.4%)	6 (20%)
Total	17 (100%)	13 (100%)	30 (100%)

P=0.672, Not significant, Fisher Exact test.

Table 7: Flap necrosis.

Flap necrosis	Procedure		Total
	Karidakis flap	Limberg flap	
Absent	16 (94.1%)	11 (84.6%)	27 (90%)
Partial	1 (5.9%)	2 (15.4%)	3 (10%)
Total	17 (100%)	13 (100%)	30 (100%)
P=0.565, Not significant, Fisher Exact test.			

Table 8: Recurrence.

Recurrence	Procedure		Total
	Karidakis flap	Limberg flap	
Absent	17 (100%)	12 (92.3%)	29 (96.7%)
Recurrence	0 (0%)	1 (7.7%)	1 (3.3%)
Total	17 (100%)	13 (100%)	30 (100%)

P=0.433, Not significant, Fisher Exact test.

The patients in both groups were followed up for a period of one year, during this period one patient in the limberg flap group had recurrence, and was treated with wide excision and healing by secondary intention. The total recurrence rate in the study was 3.3% and it was 7.7% for just the limberg flap alone.

Figure 2: Pilonidal sinus with multiple indurated openings on either side of the natal cleft.

Figure 3: Pilonidal sinus with multiple openings in midline.

Figure 4: Pilonidal sinus with multiple openings to the right of midline.

Figure 5: Pre-operative marking of skin incision for limberg flap.

The P value for- SSI, flap necrosis and necrosis was >0.1. (P-value: SSI-0.672, Flap necrosis-0.565, Recurrence-0.433).

Figure 6: Intra operative image following excision of Pilonidal sinus, pre- sacral fascia can be seen in midline the floor of the cavity. Rhomboid flap incision done, flap yet to be raised.

Figure 7: Scar after limberg flap procedure for pilonidal sinus.

Figure 8: Suture line following karidakis flap, note the suture line is offset from midline.

DISCUSSION

Pilonidal sinus is a disease of the young and male population, commonly seen among individuals who have professions needing prolonged sitting hours, in addition to obesity and hirsutism.[9,10] Although, several methods have been recognized for the management of pilonidal sinus the most commonly used techniques in our hospital are karidkis flap and limberg's flap.[21-24]

Figure 9: Scar after karidakis flap procedure for pilonidal sinus.

In our institution patients with recurrence after karidakis flap the patients underwent, limberg's flap procedure or wide excision with healing by secondary intention. In patients with recurrence after limberg's flap karidakis procedure cannot be done hence, wide excision with healing by secondary intention is in practice.

Present study shows that both the techniques are equally good with no statistically significant difference in terms of SSI, flap necrosis or recurrence.

CONCLUSION

In this retrospective observational study, there was no significant difference between the 2 techniques. Both the techniques can be used safely and effectively in sacro coccygeal pilonidal sinus disease.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the institutional ethics committee

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Cite this article as: Madhusudhan A, Swamy MDP, Arif M. Pilonidal sinus- limberg versus karidakis flap our experience at SIMS, Shivamogga. Int Surg J 2017;4:3641-5.