

Original Article

KARYDAKIS PROCEDURE VS LIMBERG FLAP IN THE TREATMENT OF SACROCOCCYGEAL PILONIDAL SINUS

Shumaila Rafique, Zainab Hassan, Rohaba Shahid, Shabbar Hussain Changazi, Zeeshan Talib and Mustansar Iqbal

Objective: To compare differences in the outcomes between these two techniques.

Methods: This was a randomized controlled trial conducted in the Services Institute of Medical Sciences, Lahore from August 2017 to August 2018. A total of 60 patients were enrolled in the study. Patients were randomly allocated in the two groups. In group A, pilonidal sinus was treated with karydakis procedure. In the group B, pilonidal sinus was excised with limberg flap. Patients were then followed on 7th day, 14th day, 1 month, 6 month and 18 months after the surgery to evaluate the postoperative results.

Results: The mean age of the patients was 28.65 ± 10.58 years. 58 patients were males and 2 patients were females. The mean BMI of the patients was 23.83 ± 3.26 kg/m². The mean duration of surgery was 40 ± 8 mins in karydakis procedure and 55 ± 10 min in limberg flap ($p=0.02$). The mean pain score (VAS) in karydakis group was 4.83 ± 1.34 while it was 4.10 ± 2.30 in limberg group ($p=0.141$). The mean hospital stay in karydakis group was 2.72 ± 0.80 days whereas the mean hospital stay in limberg group was 4.45 ± 0.92 days ($p=0.000$). Wound infection developed in 2 (6.67%) patients following karydakis procedure and in 1 (3.33%) patient after limberg flap with p-value of 0.346. The mean time for wound healing in case of karydakis group was 14.93 ± 2.79 days while it was 12.42 ± 2.36 days. In the study, 4/30 (13.33%) patients in karydakis group presented with recurrence and 2/30 (6.67%) patients in limberg group developed recurrence with p-value of 0.344.

Conclusions: It was concluded that there was shorter hospital stay in karydakis procedure and shorter healing time in limberg flap however there was no statistically significant difference in postoperative pain, wound complications and recurrence in these two procedures.

Keywords: karydakis procedure, limberg flap, comparison, postoperative outcomes.

Introduction

Pilonidal sinus is a common disease of skin affecting mostly the sacrococcygeal region (natal cleft). It results from the penetration of shed hair shafts through the skin and forming blind tract into the superficial fascia to reach the sacral fascia. This tract can be secondarily infected to form abscess.^{1,2} However, it mostly presents as a cyst or sinus tracts with or without discharge.³ The incidence of pilonidal sinus is approximately 26/100,000. It commonly affects young males with high body hair density.^{4,5} The etiology of the pilonidal sinus is a matter of debate. Initially, congenital origin was suggested that it was secondary to a remnant of an epithelial lined tract from postcoccygeal epidermal cell rests or vestigial scent cells. Now the view has widely shifted towards the acquired theory and is based on the observations that congenital tracts do not contain hair and are lined by cuboidal epithelium. Furthermore, the tip of hair is pointing towards the sinus tract.⁶ In acquired theory, three factors play a pivotal role in genesis of pilonidal sinus, namely high quantity of hair, extreme force,

and vulnerability to infections. Natal cleft is a favorable site for these factors and these are further reinforced by sweating, maceration, bacterial contamination and penetration of hair. As a result, the hair start getting buried into the deep skin to form a blind tract which is lined by granulation tissue. Other risk factors include obesity, local trauma or irritation, sedentary life style, family history and poor hygiene.^{7,8}

Although pilonidal sinus can be treated using several defined conservative and surgical methods, recurrence rates remain high.⁹ Complete removal of the pilonidal sinus or sinuses and appropriate reconstruction can lead to successful recovery.¹⁰ Various techniques for management of sacrococcygeal pilonidal sinus have been described that range from, clipping of hair with good hygiene of the area, wide excision of the area and packing, excision and primary closure like karydakis procedure, marsupialization and flap techniques like Limberg flap, modified Limberg transposition flap, elliptical rotation flap and rotation advancement fasciocutaneous flap.¹¹⁻¹⁴

This study was conducted to evaluate Karydakis procedure and Limberg flap in treatment of sacrococcygeal pilonidal sinus with reference to postoperative pain, hospital stay, wound healing and recurrence.

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Methods

This was a randomized controlled trial conducted in the department of surgery, Services Institute of Medical Sciences, Lahore from August 2017 to August 2018. A total of 60 patients were enrolled in the study. Approval was sorted out from ethical committee of the institute (IRB). Written consent was taken from all the patients. Patients with both sexes and age above 15 years with a diagnosis of pilonidal sinus assessed in the outdoor department were included in the study. Patients with infected pilonidal sinus, pilonidal abscess, recurrent pilonidal sinus and immunocompromised patients like uncontrolled diabetes and using steroids were excluded from the study. After initial evaluation, patients were randomly allocated in the two groups. In group A, pilonidal sinus was treated with karydakis procedure. In this technique, asymmetric elliptical or semi lunar incision with the poles of ellipse was placed about 2 cm to the side of the midline. The tissue was then excised down to the sacral fascia. After excision full-thickness mobilization of the contralateral surgical margin was carried out and fixation of the base of the flap to the sacral fascia was done and finally, the skin edges were sutured off the midline. In the group B, pilonidal sinus was excised with limberg flap. In this technique, a rhomboid-shaped incision was given with cephalic and caudal apex of the rhombus placed about 2 cm to the side of the midline. After incision dissection was done down to the sacral fascia and the tissue was excised. A fasciocutaneous rhomboid flap was then created and transposed over the defect without tension. All the operations were done by a consultant, at least at the level of senior registrar. Patients were then followed on 7 th day, 14th day, 1 month, 6 month and 18 months after the surgery to evaluate the postoperative results. Appearance of discharging sinus/sinuses on scare line was considered as recurrence after surgery.

Frequency and percentages were calculated for

quantitative data.. T test (mean postoperative pain score, mean hospital stay, mean healing time) and chi-square tests (recurrence) were applied in order to compare the data of both groups. A p value of 0.05 or less was taken as significant. This trial as registered to clinicaltrial.gov with reference number NCT03765086.

Results

Total of 60 patients were enrolled in the study with 30 patients in each group. The mean age of the patients was 28.65 ± 10.58 years. The man age in karydakis group was 27.66 ± 11.53 years while mean age in limberg group was 29.58 ± 9.7 years. Out of total 60 patients, 58 patients were males and 2 patients were females. The mean BMI of patients was 23.83 ± 3.26 kg/m² (**Table 1**). The mean duration of surgery was 40 ± 8 mins in karydakis procedure and 55 ± 10 min in limberg flap with significant p-value (0.02). The mean pain score (VAS) in karydakis groups was 4.83 ± 1.34 , while it was 4.10 ± 2.30 in limberg group however the value was statistically significant ($p=0.141$). The mean hospital stay in karydakis group was 2.72 ± 0.80 days whereas the mean hospital stay in limberg group was 4.45 ± 0.92 days with p-value of 0.00. In this study, wound infection developed in 2 (6.67%) patients following karydakis procedure and in 1 (3.33%) patient after limberg flap with p-value of 0.346. The mean time for wound healing in case of karydakis group was 14.93 ± 2.79 days while it was 12.42 ± 2.36 days in limberg group with statistically significant p-value. In the study, 4/30 (13.33%)

Table-1: Comparison of preoperative parameters of both group.

Variables	Karydakis Group	Limberg Group	Total	p-value
Age (mean)	27.66 ± 11.53	29.58 ± 9.7	28.65 ± 10.58	0.486
BMI (Mean)	23.65 ± 3.68	24 ± 2.87	23.83 ± 3.26	0.868
Gender	Male	29	58	0.987
	Female	1	2	

Table-2: Comparison of postoperative parameters in both surgical procedures.

Variables	Karydakis Group	Limberg Group	p-value
Postoperative Pain	4.83 ± 1.34	4.10 ± 2.30	0.141
Hospital Stay (Days)	2.72 ± 0.80	4.45 ± 0.92	0.00
Healing time (Days)	14.93 ± 2.79	12.41 ± 2.36	0.00
Recurrence	4 (cases)	2 (cases)	0.344

patients in karydakís group presented with recurrence and 2/30 (6.67%) patients in limberg group developed recurrence with p-value of 0.344 (Table-2).

Discussion

There is still no consensus about the treatment of choice for pilonidal sinus disease. Ideally, therapy should be associated with short hospital stay, less painful postoperative time, rapid healing and return to work, less painful dressing of wound, short duration of wound care and a low recurrence rate. No technique fulfills all of these criteria. Since the source of the disease is thought to be natal cleft and deep intergluteal sulcus, the aims of the flap techniques are natal cleft flattening, lateralization and fulfilling of the defect without tension. This study was conducted to compare the postoperative outcomes in primary closure by karydakís method and flap coverage by limberg flap.

Pilonidal disease usually affects male and young people. In this study most of the patients affected with pilonidal sinus were males and mostly presented in their second decade of life. These results were in close agreement with the results reported by Akca et al.¹⁶ and Mahdy et al.¹⁷ in their studies. In this study, the mean operative time in limberg flap was longer as compared to karydakís procedure with statistically significant p-value. Similar results were also elaborated by other researchers.^{18,19} However, some studies showed that there was no statistically significant difference between the two procedures.²⁰ Longer duration of surgery in limberg procedure in this study can be attributed to the flap dissection and then flap rotation and closure as compared to primary

closure after excision in the karydakís procedure.

In the present study, there was no significant difference in the mean pain scores between the two groups. However, hospital stay was shorter in karydakís procedure and healing time was shorter in limberg flap with statistically significant difference. Karaca et al.²¹ and Ersoy et al.²² reported that the limberg flap group had lesser postoperative pain, shorter hospital stay and early wound healing as compared to karydakís procedure. However, Can et al.²⁴ in their study demonstrated comparable postoperative pain and hospital stay in both groups but early healing in karydakís procedure.

In the current study, there was no significant difference in wound infection and recurrence between the two methods ($P > 0.05$). These results were in concordance with studies conducted by Campbell et al.²⁴ and Bali et al.²⁵ however, Mentés et al.¹⁵ and Ersoy et al.²² reported that limberg flaps presented lower complication rates and recurrence than karydakís procedure in their respective series. Conversely, Ates et al.¹⁸ reported lower recurrence and complication rates for the karydakís technique than for the limberg flap technique.

Conclusion

It was concluded that there was shorter hospital stay in karydakís procedure and shorter healing time in limberg flap however there was no statistically significant difference in postoperative pain, wound complications and recurrence in these two procedures.

*Department of Surgical Special
Services Hospital, Lahore
www.esculapio.pk*

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