

Comparison of Karydakis technique with Limberg Flap Procedure in Pilonidal Sinus Disease: Advantages of Karydakis technique

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ABSTRACT

Objective: Several surgical techniques are being performed in the treatment of pilonidal sinus disease; however there is no single agreed technique that could be used in all patients. In this study we compared the results of the patients on which we implemented Karydakis Technique and Limberg flap procedure, the two most common techniques and tried to find the better operative modality.

Methodology: One hundred thirty three patients operated between January 2004 and November 2008 and followed up regularly were included in the study. Patients who came applied due to recurrence were not included. Seventy three patients were operated with Karydakis technique and 60 patients were operated with Limberg flap procedure. Two groups were compared in terms of hospitalization period, work loss period, recurrence rate, infection rate, and whether seroma and hematoma formed or not.

Results: Operation period, hospitalization period, work loss period were shorter for the patients on which Karydakis technique was implemented ($P < 0.05$). While no statistically significant difference was observed between the two groups in terms of recurrence rate ($P = 0.034$), wound dehiscence, wound infection, hematoma/seroma rate were more in Limberg flap group ($P = 0.001$, $P = 0.032$, $P = 0.022$, respectively).

Conclusion: Karydakis technique, which is one of the most practiced surgical techniques in treatment of Pilonidal sinus disease, should be a preferred method in terms of shorter operation time, hospitalization period and less work loss and lower complication.

KEY WORDS: Pilonidal disease, Karydakis technique, Limberg Flap, Complications.

Pak J Med Sci October - December 2010 Vol. 26 No. 4 773-777

How to cite this article:

Bostanoglu S, Sakcak I, Avsar FM, Cosgun E, Hamamci EO. Comparison of Karydakis technique with Limberg Flap Procedure in Pilonidal Sinus Disease: Advantages of Karydakis technique. Pak J Med Sci 2010;26(4):773-777

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- * Received for Publication: January 20, 2010
- * Revision Received: July 30, 2010
- * Revision Accepted: August 18, 2010

INTRODUCTION

Pilonidal sinus disease (PSD) is a common disorder in man which occurs in the 3rd decade and lowers the quality of life. There are some predisposing factors for its occurrence. Some of these factors are hairy sacrococcygeal area, sitting on the firm ground for a long time, narrow and deep natal cleft and humid skin.¹⁻³

The fact that PSD might occur in different parts of the body such as umbilical area, finger pulp, axilla, nipple areola; it is often formed in sacrococcygeal area in young men.⁴⁻⁷ There are three important factors for its formation. These are (1) accumulation of

breaking hair in sacrococcygeal excavatio (2) Scuffing of narrow natal cleft which cause hair ingrowth due to friction and thirdly easy hair ingrowth in young adults due to its hard structure. Ideal surgical treatment are still being discussed. Due to frequent operative producers conducted with midline incision and late recovery period, many surgeons prefer Karydakakis technique (KT) which is a asymmetric primary closure technique or Limberg flap procedure (LFP) prepared in rhomboid manner.^{8,9}

In this study, the results of the patients on which we used KT and LFP due to SPD for which there is no single agreed operation method were compared retrospectively and superior procedure was tried to be determined through an objective criteria.

METHODOLOGY

Data of 133 patients operated with KT or LFP due to PSD between January 2004 and November 2008 were compared retrospectively. Patients who came due to recurrence were not included. Data concerning the patients were obtained from patient files, operating room records, and hospital records. Information was obtained via telephone when necessary. Patients with active infection were operated along with antibiotic treatment.

Seventy three patients were operated with KT and 60 patients were operated with LFP. Antibiotic prophylaxis was not used. Patients were not fed for 8 hours before the operation. Operations were conducted in Jack-knife position under spinal anesthesia. Hips were pulled to the sides via plasters in order to provide better vision. Operation area was shaved and hairs were removed. Upon exercising aseptis by povidone iodine, methylene blue was injected to main orifices and the borders of pilonidal cyst were tried to be determined.

Surgical Techniques: Karydakakis technique after removal of the pilonidal focus with an incision 3cm wider on either (right or left) side of the midline, the subcutaneous tissue under the medial part of the incision was dissected free superficial to the postsacral fascia enabling it to be mobilized and the wound was closed primary by 2-0 polypropylene sutures incorporating the presacral fascia.

Limberg flap procedure After excision of the pilonidal focus by a rhomboid-shaped incision including all of the sinus orifices, a Limberg transposition flap on either side was prepared incorporating the gluteal fascia. This was transposed medially and approximated full-thickness including the postsacral fascia by 1-0 polypropylene interrupted sutures.

Postoperative Follow-up: Patients were mobilized on the postoperative 1st day. They were discharged from the hospital on the second day if there was no flix, seroma or hematoma. Sutures were removed on the 10th postoperative day and patients were told to have a bath. Patients were asked to come for controls on the first month, third month, sixth month and twelfth month and once a year after then.

Statistical Analyses: Categorical variables are expressed as counts and percentage whereas numerical variables are expressed as mean and standard deviation in the statistical analyses. Whether the data regarding the patients was evenly distributed was analyzed by Kolmogorov Smirnov Test, p value >0.05 indicating an even distribution. The statistical comparison of the data with regard to the operative procedure was done non-parametrically by Mann Whitney U test, p<0.05 was considered significant. The difference between operative procedures in categorical variables was analyzed by Fisher Exact Ki-Square and Pearsson Ki-Square tests, p<0.05 was considered significant.

RESULTS

Seventy three (54.9 %) out of 133 patients included in the study were operated with Karydakakis technique and 60 (45.1 %) patients were operated with Limberg flap procedure. One hundred twenty seven (95.5 %) of the patients were male and six (4.5 %) of them were female. The two groups were statistically similar in terms of age, gender, the number of sinus orifices and the duration of the symptoms (P=0.442, P=0.222, P=0.534, P=0.338, respectively) (Table-I).

The two groups were compared in terms of clinical results (Table-II). Operation period was shorter in KT when compared to LFP (P<0.001). Hospitalization period was shorter in KT group (P<0.001).

Table-I: Baseline Characteristics of Patients.

Variable	KT*	LFP**	P value
	n=73	n=60	
Age, years (SD)	26.2 ± 6.5	27.3 ± 9.1	0.442
Male/Female ratio	69/4	58/2	0.222
Symptom duration, years (SD)	2.1 ± 1.2	1.9 ± 1.8	0.534
Number of sinus orifice, n	2.6 ± 0.9	2.8 ± 1.2	0.338

* Karydakakis technique

** Limberg flap procedure

Table-II: Comparison of Clinical Results of Karydakis Technique with Limberg Flap Procedure.

Clinical Outcomes	KT*	LFP**	P value
	n=73	n=60	
Operative time, minutes (SD)	43±10.5	55±12.5	0.001
Hospital stay, days (SD)	3.0±1.5	4.3±1.5	0.001
Duration of follow-up, months (SD)	21.2±8.6	21.3±6.8	0.688
Time of work, days (SD)	14.6±6.1	17.7±5.4	0.001

* Karydakis technique ** Limberg flap procedure

There was no difference between the groups in terms of follow up periods ($P=0.688$). When the groups were compared in terms of work loss, it was shorter in KT group ($P<0.001$).

When it was searched if there was a difference between the groups in terms of complication rates, it was found out that there was less complication in KT group (Table-III). While recurrence was observed in two patients (2.7%) in KT group, it was observed in three (5.0%) patients in LFP group ($P=0.034$). Recurrences were observed in both groups within the first year. Wound dehiscence, wound infection, and hematoma/seroma rate were less in KT group ($P=0.001$, $P=0.032$, $P=0.022$, respectively). Stitches of some patients with hematoma/seroma were removed and drained. Wounds of the patients with wound dehiscence and wound infection were left open and secondary recovery was provided. *Staphylococcus aureus* and *Pseudomonas* were isolated in the two patients from whom wound culture were collected in KT group. *Staphylococcus aureus* was isolated from five cases in LFP group from which cultures were collected. Proper antibiotics treatments were started in accordance with the results of the sensitivity test.

Ages of the two patients with wound dehiscence in LFP group on 7th and 9th post operative days were 21 and 26 respectively. Wound dehiscence of the both patients occurred on the lower parts of the incision closer to anal area.

DISCUSSION

Despite several maintenance techniques that have been reported since the publication of the first article in 1884 explaining the treatment of PSD patients, there is no single agreed treatment method that could be implemented in all PSD patients.⁹ Bascom published the results of the 149 patients whose hair follicles were removed and who were treated through lateral drainage and followed up for 3.5 years.¹⁰ It was stated in the study that midline incision should be avoided. When sinus excision is implemented, there occurs a wide defect and closing this defect in the midline primarily results in high morbidity and recurrence.¹¹ Almost perfect recovery occurs in KT and LFP, in which wound sides were approximated away from the midline.¹²⁻¹⁴

Hospital stay period is an important criteria displaying the success of the surgical technique. This

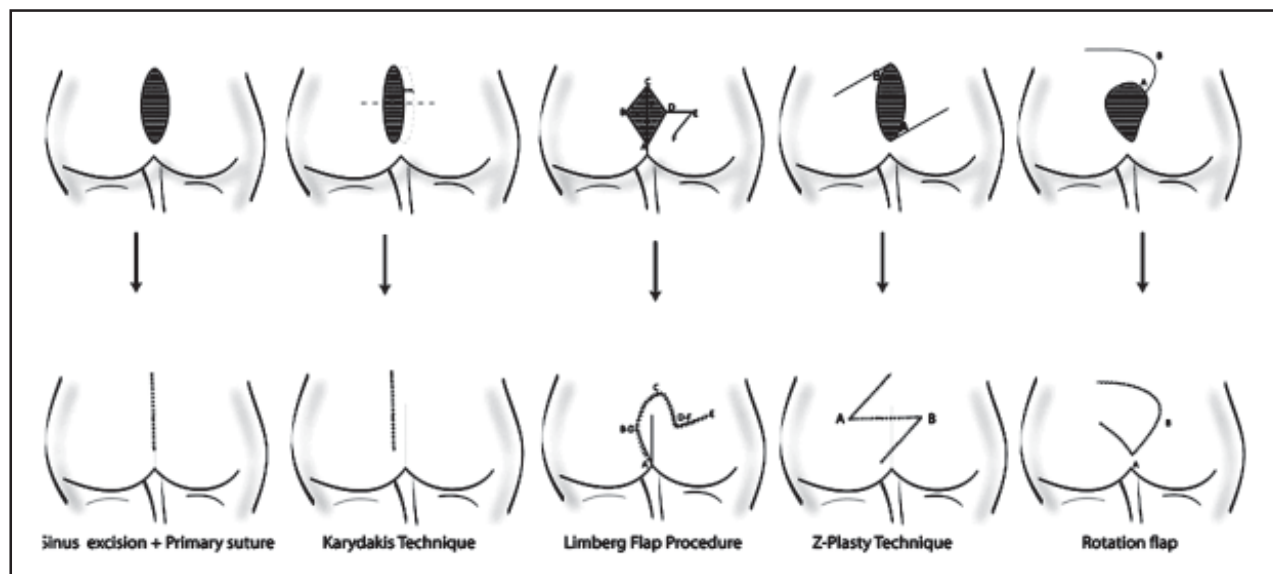


Figure-1: Different, Surgery Techniques of Pilonidal Sinus Disease.

Table-III: Comparison of Complications of Karydakis Technique with Limberg Flap Procedure.

	KT*	LFP**	P value
Recurrences	2 (2.7)	3(5.0)	0.034
Wound dehiscence	0	2(3.3)	0.001
Wound infection	2 (2.7)	5 (8.3)	0.032
Hematoma, seroma	1(1.4)	3 (5.0)	0.022

* Karydakis technique

** Limberg flap procedure

period varies between 2 to 6 days in the studies where results of the patients operated with KT were announced.^{15,16} Some studies stated that the hospital stay of KT group patients were shorter than that of LFP. Average hospital stay of 82 patients for whom KT was exercised by Bessa¹⁷ has been reported as two days. Ebu Galala et al.¹⁸ reported average hospital stay of the LFP exercised patients as six days. In our study hospital stay periods were 3.1 and 4.5 days respectively for KT and LFP.

Work loss is an important parameter in comparing operative methods in terms of comparing cost of the treatment, negative effects of the operation and patient comfort. Daphan et al.¹⁹ reported work loss of LFP group patients as 18.8 days. Mahdy et al.⁹ reported this period in their study in which they published the results of LFP implemented patients as 14.8 days. Anderson et al.²⁰ reported average work loss of 51 patients operated with KT as three weeks. In our study work loss in KT and LFP was 14.6 and 17.7 days respectively. The reason why work loss of KT patients is lower than the LFP group patients might be the shorter and narrower incision when compared to the other studies. Other studies researchers state that they exercise elliptical incision generally at least 5cm wide and prepare flap of 2cm wide.^{9,20} However we remove 3cm narrow skin flap including all cyst walls if side sinus orifices are not very far from the midline. We make sure that the flap prepared is short as much as possible.

Mentes et al.²¹ have reported that wound dehiscence 1.7% and wound infection 6.5% occurred in 353 patients, for whom LFP was implemented. Bessa et al.¹⁷ reported wound infection in four (4.9%) patients out of 82 patients in whom KT was used. In our study wound infection of KT group occurred in two (2.7 %) patients and in five (8.3%) patients in LFP group (P=0.032). Wound dehiscence occurred in two (3.3%) patients in LFP group. In KT described by Kitchen¹⁶, it is noted that the lower end of the incision should be at least 1cm away from the anal verge. Accordingly it is presumed that the

dissection performed outside the external anal sphincter and ischioirectal fatty tissue will decrease wound infection. Wound dehiscence occurs on the lower parts of the incision close to the anal canal. It is felt that this area is often exposed to anaerobic microorganisms due to maceration stemming from high skin secretion and being close to the anal canal therefore the wound is affected negatively.

Approximating incision to the midline in PSD, wound infection and bad hygiene are the major reasons for recurrence. Daphan et al.¹⁹ reported recurrence in seven (4.8%) LFP patients out of 147. Urhan et al.²² reported recurrence in five (4.9%) LFP patients out of 102. Karydakis¹³ reported recurrence rate below 1% upon healing of the wound. Anyanwu et al.²³, one of the researchers conducting PSD treatment via KT, reported that there was no recurrence in 28 patients, who were followed up average for about three years with KT. Petersen et al.²⁴ has stated in their meta analysis of 74 studies that less recurrence was observed in KT patients when compared to other techniques. The reason behind the less recurrence in KT patients is the decreasing depth of sacrococcygeal excavatio and disappearance of friction effect due to the position on the lateral of the midline. In our series recurrence was noted in KT in two (2.7%) patients and in three (5.0%) in LFP patients respectively (P=0.034).

CONCLUSION

PSD is an important health problem affecting the quality of life for young adults. Several surgical techniques are being implemented in the treatment; however there is no single agreed technique that could be implemented in all patients. KT and LFP are frequently used operative techniques. Among these two producers, KT should be the first preferred operation method in terms of shorter operation time, shorter hospitalization period, less work loss and lower complication rates along with lower recurrence.

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