Original Research Article

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Modified Limberg flap versus modified Karydakis flap in pilonidal sinus disease: single surgeon experience

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ABSTRACT

Background: The aim of this study was to analyze and compare the results of the modified Limberg flap (MLF) and modified Karydakis flap (MKF) techniques which were performed for the treatment of pilonidal sinus disease (PSD). **Methods:** The patients who were operated for PSD by the same surgeon between November 2010 and July 2013 in Konya Seydisehir Hospital were retrospectively analyzed. A total of 106 patients were evaluated in this study regarding age, gender, operation time, length of hospital stay, and postoperative complications.

Results: There were 14 female and 92 male patients (MLF; 5/52 and MKF; 9/40). MLF was performed in 57 (53.8%) patients and MKF was performed in 49 (46.2%) patients. Length of Hospital stay and drain removal time were less in MKF group but it was not significantly different between two groups (p>0.05). Operation time was shorter in MKF group than MLF group (p<0.05). The complication rates of the MLF and MKF groups were 10.5% and 12.2% respectively. The recurrence was seen in 1 patient in MLF group and 2 in MKF group.

Conclusions: MKF has shorter operation time than MLF, however both techniques have a similar complication and recurrence rate. In conclusion MLF and MKF procedures can be safely used as a surgical treatment of PSD.

Keywords: Pilonidal sinus disease, Surgery, Modified Limberg flap, Modified Karydakis flap

INTRODUCTION

Pilonidal sinus disease (PSD), which mostly occurs in sacrococcygeal region is a common chronic health problem usually affecting young adults. Congenital and acquired factors are described previously but its etiology is still not clear. Several non-surgical and surgical modalities have been proposed for the treatment of PSD but there is still no optimal treatment modality. The main principle of the surgical treatment is completely excision of the sinus tract. Following the excision there are numerous surgical options such as open packing, marsupialization, primary closure and flap procedures. 2-4

Different types of flap procedures have been described for the treatment of PSD and nowadays these techniques have been preferred due to the low complication and recurrence rates. Classical Limberg flap (CLF) is efficient method for PSD and mostly performed for the surgical management of the disease worldwide. The disadvantage of the CLF is the lower part of the suture line is located at the intergluteal sulcus and at the postoperative period skin maceration and recurrence can occur at this location. To minimize this complication, modified Limberg flap (MLF) was described to lateralize the suture line.

The Karydakis procedure was described in 1973 is an asymmetric flap technique used in the treatment of PSD.⁶ Bessa modified the technique and reported that local defenses against hair insertion could be maximized by decreasing or neutralizing the force factor as well by his modified Karydakis flap (MKF) technique.⁷ The aim of this present study was to analyze and compare the results

of the MLF and MKF techniques which were performed by the same surgeon in a rural hospital.

METHODS

In this study 121 patients who were operated for PSD between November 2010 and July 2013 in Konya Seydisehir Hospital were included. 12 patients who had recurrence disease (n=3), psychiatric problem (n=1); tetraplegia (n=1); were using steroids (n=1); had limited disease treated by excision and open packing (n=3): could not be followed up (n=7) were excluded. Therefore, a total of 106 patients were analyzed in this study with age, gender, operation and length of hospital stay, removal time of the drain, postoperative complications (maceration, infection, seroma, hematoma) recurrence rate. The data of the recurrence rate was collected by telephone interview at May 2015. Patients who have acute abscess were treated with surgical drainage and antibiotics (second generation of cephalosporine and metronidazole for 7 days), When there was no sign of infection, they were operated for about 2-4 weeks after the drainage.

This study was approved by the appropriate ethics committee of Adana Numune Research and Training Hospital and has therefore been performed in accordance with the ethical standards in the Declaration of Helsinki

Surgical procedure

All operations were performed under spinal anesthesia. After positioning the patient in the Jack-knife position, shaving was performed and 1 gr of 1st generation of cephalosporine was intravenously administered. 10% povidone-iodine was used to clean the operation site. Rectal cleaning was not performed preoperatively. Methylene blue was injected through the sinus pits and all of the sinus tracts were resected totally till the sacral fasia. A suction drain was placed on the postsacral fasia in all operations.

Group 1: modified Limberg flap

Modified Limberg flap (MLF) was performed according to the technique reported by Mentes et al.⁵ A wide rhomboid excision was made asymmetrically to place the inferior part of the flap 1 cm lateral to the midline. Fasiocutaneous Limberg flap which was elevated from the contralateral side of the asymmetric corner, was transposed medially to fill the rhomboid defect. A suction drain was placed on the postsacral fasia. Flap was fixed the postsacral fasia with interrupted 0/0 vicryl sutures, subcutaneus tissue was approximated with 3/0 vicryl interrupted sutures, skin was closed with 3/0 polypropylene sutures (Figure 1).

Group 2: modified Karydakis flap

Modified Karydakis flap (MKF) was performed according to the technique described by Bessa.⁷ An

asymmetrical elliptical incision thats' superior and inferior part was placed 2 cm lateral to the midline, was performed. A fasiocutaneous flap was prepared above the gluteus muscle from contralateral side of the asymmetric wound. The flap was sutured directly to the lateral edge of the wound without fixation to the sacral fasia by using interrupted 0/0 vicryl sutures. A vacuum drain was placed to the cavity and subcutaneus layer was sutured with 3/0 vicryl interrupted sutures, skin was closed with 3/0 polypropylene sutures (Figure 2).

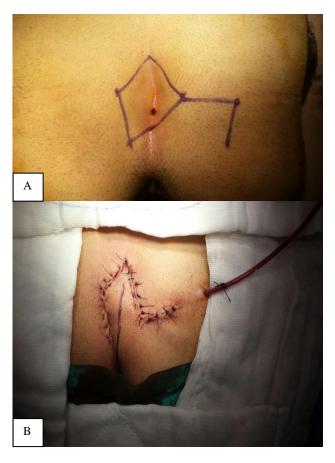


Figure 1: MLF. (A) Operative design of MLF, (B) postoperative appearance of MLF.

The suction drain was removed after the drainage was less than 25 ml per 24 h. Patients were discharged on the day of the drain removed. The oral form of second generation of cephalosporine and metronidazole was given for 7 days postoperatively. If there was no complication, skin sutures were removed postoperative 14 days.

Statistical analysis

The statistical analyses were performed by using SPSS 16 (SPSS Inc., Chicago, IL, USA). The demographic data were compared with student's t test. Pearson's 2 analysis was used to evaluate the complications and recurrence between two groups. Operation, hospitalization and drain removal time, were compared between two groups by

using Mann-Whitney U test. A p value <0.05 was considered statistically significant.

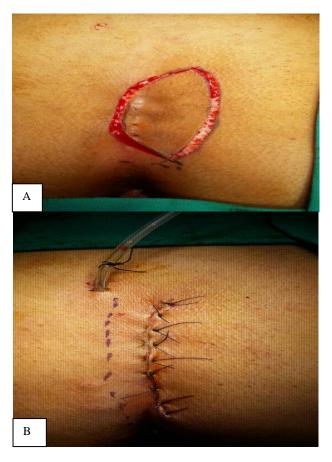


Figure 2: MKF. (A) Operative design of MKF. (B) Postoperative appearance of MKF.

RESULTS

There were 14 female and 92 male patients (MLF; 5/52 and MKF; 9/40). MLF was performed in 57 (53.8%) patients and MKF was performed in 49 (46.2%) patients. Length of hospital stay and drain removal time were less in MKF group but it was not significantly different between two groups (p>0.05). Operation time was shorter in MKF group than MLF group (p<0.05) (Table 1).

The complication rates of the MLF and MKF groups were 10.5 % and 12.2% respectively. 3 patients had maceration in MLF group and 4 patients in MKF group (5.3% and 8.2% p>0.05). The maceration was always observed on the lower part of the incision and threated with conservatively. The wound infection was detected in 1 patient in MLF group and 2 patients in MKF group, the overall wound infection rate was 2.8%. Antibiotics or surgical drainage were used for the wound infections. Seroma was found 4 patients (2/2, MLF/MKF). 2 of 4 patients had seroma, progressed to wound infection and were treated with simple drainage. One patient had hematoma in MLF group and there was no hematoma in MKF group. The wound infection, seroma and hematoma rates were not statically different between two groups (Table 2).

The recurrence was seen in one patient in MLF group and 2 in MKF group. The mean time of recurrence was 16 months. The recurrence rate was not statistically different between MLF and MKF groups.

Table 1: Demographic data of the groups.

Characteristics	MLF (n=57)	SD	MKF (n=49)	SD	P value
Age	28.80	±10.14	25.30	±7.12	0.097
Female/male	5/52		9/40		
Operation time	44.40	±5.88	33.30	±4.75	<0.001*
Hospitalization day	3.07	±0.75	2.97	±0.72	0.499
Follow-up period (month)	34.33	±7.66	36.30	±8.43	0.274

Mann-Whitney U test, *p<0.05.

Table 2: Comparison of the results.

	MLF (n=57)	%	MKF (n=49)	%	P value
Complication	6	10.5	6	12.2	0.781
Maceration	3	5.3	4	8.2	0.549
Wound infection	1	1.8	2	4.1	0.471
Seroma	2	3.5	2	4.1	0.877
Hematoma	1	1.8	0	0	0.352
Recurrance	1	1.8	2	4.1	0.471

Chi-square test.

DISCUSSION

The surgical treatment of PSD should have short time to return work, less pain, lower complication and recurrence rates. Numerous modalities were described which proposed this matter but there is no clear consensus about the ideal surgical treatment of the PSD. Flattening the deep intergluteal sulcus and lateralizing the suture line, minimize the risk of complication and recurrence. ⁵⁻⁷ For this reason, flap procedures have been recently used mostly.

MLF, described by Mentes et al. has an advantage of lateralizing the lower part of the suture line when compared with the CLF.⁵ This advantage of MLF over the CLF causes lower complication and recurrence rates. Mentes et al reported 0% recurrence, 0.8% complication rate and Akin et al found 0.97% recurrence rate at their studies.^{5,8} In this study the recurrence rate was 1.8%. It seems a bit higher when compared to the literature but only one patient in MLF group had a recurrence.

Karydakis described his technique in 1973 and 6545 patients included in his study. He reported <1% recurrence rate. The principles of Karydakis procedure were excision vulnerable raphe, and avoiding the midline suture line at the intergluteal sulcus. 6 In Bessa's modification technique, the flap was not fixed to the sacrococcygeal fasia, it was sutured directly to the lateral edge of the contralateral side. Thus creates a more flattening natal creft than the classic Karydakis procedure. There was no recurrence with 80 patients and 20 months of follow up in Bessa's study. A few studies are present in the literature about the modified Karvdakis flap. Karaca et al reported 5.7% recurrence and 22.9% complication rate. As similar in this study, the recurrence rate was 4.1% and the complication rate was 12,2% in the MKF group.

In this study the operation time was 44.4 min (± 5.88) in MLF group and 33.3 min (±4.75) in MKF group. The operation time was statistically lower in MKF group than MLF group. The incision length was longer and the surgical region was larger in MLF, compared with the MKF so that it takes long time. Similarly, Karaca et al found less operative time in MKF group. 9 The mean length of hospital stay in flap procedures varies 2 to 5.5 days and they could be safely performed as day-case surgery. 7,10-13 In this study the patients in both of groups did not discharged before removing the drain. We thought that the patients could be discharged after the day of surgery but these operations performed in a rural hospital so the patients socio-economic and hygienic status were low cause of this avoiding the wound infection the patients discharged the day remove of the drain. The length of hospitalization days of MLF and MKF groups in our study were 3.07 days (±0.75) and 2.97 days (± 0.72) respectively.

Seroma, maceration, hematoma and wound infection are most frequent morbidities that delays healing time after the surgery of the PSD. In previous studies postoperative complication rates of the flap techniques has been reported between 4.2% and 22.9%. ^{7,9,12,14} In this study suction drain was used in all operations, oral antibiotics were administered at postoperative period and movement restrictions were advised to the patients till removing the skin sutures. With these postoperative management, the complication rates of the MLF and MKF groups was 10.5% and 12.2% respectively in present study.

The main parameters of evaluating the efficiency of the procedures that were performed as surgical treatment of the PSD are complication and recurrence rates. In this study MKF has a shorter operation time than MLF, however both of the techniques have a similar complication and recurrence rate.

This study has several limitations. Firstly, this was a retrospective non-rondomised study. Postoperative pain and cosmetic satisfaction of the patients were not assed. Although in present study the number of patients was low, it is the first study establishing the modified Karydakis flap performed by a single surgeon after Bessa described the technique. Further prospective studies with large number of cases are needed for the evolution of this procedure.

CONCLUSION

Although MKF has shorter operation time than MLF, complications and recurrence rates were similar in both techniques. MLF and MKF procedures can be safely used as surgical options for the treatment of PSD.

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Ethical approval: The study was approved by the

Institutional Ethics Committee

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