

Diathermy versus scalpel in Limberg flap in pilonidal sinus surgery

A prospective randomized trial



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Koray Das*, Abdurrahman Selcuk Uzun*, Hilmi Bozkurt*, Faruk Karateke*, Ebru Menekse*, Halil Nacar**, Mehmet Ozdogan*

*Numune Training and Research Hospital, Department of General Surgery, Adana, Turkey

**Numune Training and Research Hospital, Department of Anesthesia, Adana, Turkey

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BACKGROUND: Rhomboid excision with Limberg flap repair (RELIF) is an effective surgical procedure in pilonidal sinus disease (PSD) treatment. This study aimed to compare outcome of diathermy and scalpel in RELIF procedure in PSD surgery.

METHODS: Patients undergoing RELIF procedure due to PSD at Adana Numune Training and Research Hospital between January 2012 and September 2012 were randomly assigned to diathermy (n=30) or scalpel (n=30) groups. The primary outcomes measured were duration of operation, drainage volume, postoperative numerical pain intensity scale (NPIS) scores, complications, duration of hospitalization length and time to return to daily activity.

RESULTS: The mean age was 26.2 years (17-44 years). The mean operation duration was significantly lower in diathermy group (p=0.0001). Postoperative total NPIS score within the first 24 h was significantly lower in diathermy group (p=0.001). However, there were not any significant differences in term of NPIS scores in day 3 and day 7. There were no significant differences in terms of total drain output, drain removal time and length of hospital stay. There were no significant differences between groups in terms of duration to sit comfortably, return to daily activity and work. Recurrence of PSD was emerged in one patient in the diathermy group.

CONCLUSION: Diathermy dissection in RELIF procedure in pilonidal sinus surgery is a safe technique and decreased operation time and postoperative pain. (NCT: ANEAH.EK.2012/21)

KEY WORDS: Diathermy, Limberg flap, Pain score, Pilonidal sinus, Scalpel

Introduction

Pilonidal sinus disease (PSD) is a chronic disease characterized with intermittent swelling, abscess formation, smelly discharge, and pain. Mostly occurs in sacrococcygeal region in males. In addition to the reduced quality of life, productive power of the population is negatively

affected due to the high incidence rates in younger and working population¹. Although there are numerous surgical alternatives for the treatment, none of them is considered as gold-standard². Rhomboid excision with Limberg flap repair (RELIF) is an effective surgical procedure in PSD treatment with good results and low recurrence rate^{3,4}. However, this procedure is known to be more complex and has longer operation durations compared to other alternatives. Practically, only a few surgeons prefer diathermy in order to decrease the operation duration with the majority favoring the scalpel, which is thought to be the safer alternative concerning wound healing. To our knowledge, there is no study comparing the outcomes of diathermy and scalpel dissections during RELIF technique in the English literature. This study aimed to compare diathermy and scalpel

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Correspondence to: Koray Das, MD, Numune Eğitim ve Arastırma Hastanesi. Genel Cerrahi Klinigi. Adana, Turkey (e-mail: koraydas@yahoo.com)

in RELIF procedure in terms of operation time, post-operative pain, complications, drainage volumes, wound healing and return to daily activity.

Patients and Methods

The study design was approved by the Local Ethics Committee of the Adana Numune Training and Research Hospital (Clinical trial number: ANEAH.EK.2012/21) and conducted between January 2012 and September 2012. A total of 60 patients with pilonidal sinus disease were included to the study. After obtaining written informed consents, patients were prospectively randomized into diathermy or scalpel groups (30 patients in each group). Randomization was performed by opening a sequentially numbered envelope containing the name of the operative technique to be performed. Random allocation sequence was generated by the author KD. EM enrolled participants, and KD, ASU, EM assigned participants to interventions.

Cephazolin sodium (Cezol® 1gr I.V. Powder vial, Deva Holding A.S, Turkey) was administered to all patients just before the operation for prophylaxis. Anesthesia technique was standardized and spinal anesthesia by bupivacaine hydrochlorur (0,5% Heavy marcaine, dextrose monohydrate 80 mg/ml) was performed in all patients.

The patients were placed in jackknife position and operation field was shaved by a hair clipper. Rhomboid excision area and flap were designed and mapped on the skin. The operation field was prepared with povidone-iodine. In diathermy group; skin incision, rhomboid excision and Limberg fascia cutaneous flap repair were performed using a monopolar needle electrocauter by setting the device to cutting mode at 50 watts (Force Triad™, Covidien Ireland Limited, Mansfield, USA). In the scalpel group, all surgical procedures were performed by scalpel, with the exception of providing the homeostasis by using electrocauter. A suction drain was placed on the presacral fascia in all patients. The Limberg flap was sutured to the fascia with separate 2/0 absorbable sutures (Monocryl™, Ethicon Inc., Johnson&Johnson Company, USA). Skin was closed with separate mattress sutures by using 3/0 polypropylene (Prolene™, Ethicon Inc., Johnson&Johnson Company, USA). The drains were removed after drainage decreased to less than 30 ml/day. Diclofenac sodium 75 mg was administered to all patients twice a day postoperatively. The demographic data, duration of operation, drainage volume and length of hospital stay were recorded. Postoperative pain assessment was performed using an 11 point numerical pain intensity scale (NPIS), in which a rating of 0 indicated 'no pain' and a rating of 10 indicated the 'worst imaginable pain'. Pain assessment was administered by authors HB and FK. In order to blind the scorer, one of the aforementioned authors who were not assigned in the operation room was tasked. Following surgery, pain assessments were measured by the patients'

bed at the end of the 1st 8th and the 24th hours. The patients were discharged after removal of drains. NPIS scores were measured by the same authors at the outpatient clinic at the 3rd and 7th days. Sutures were removed on the 10th day.

In addition to NPIS, patients were evaluated for post-operative complications and time to return to daily activity data at the 3rd, 7th and 30th days. All were followed up periodically for 5-12 months.

Statistical analysis

A sample size analysis based upon previous studies indicated that 30 patients per each group would be sufficient to produce a power of 0.8. All the data were statistically analyzed by SPSS for Windows v.16.0 packaged software. Data were presented as mean±SD and median. Statistical differences between the groups were assessed by Mann-Whitney *U* test. *P*<0.05 was accepted as statistically significant.

Results

A total of 60 patients were included in the study. One patient in scalpel group was lost during follow up. A total of 59 patients (54 male and 5 female) were included in the statistical analysis (Table I). The mean age was 26.2 years (17-44 years). There was no statistically significant difference between the groups in terms of demographic data (Table ii).

The mean operation duration was significantly lower in diathermy group (*p*=0.0001). Postoperative total NPIS score within the first 24 h was significantly lower in diathermy group (*p*=0.001). However, there were not any significant differences in term of NPIS scores in day 3 and day 7. There were no significant differences in terms of total drain output, drain removal time and length of hospital stay (Table II).

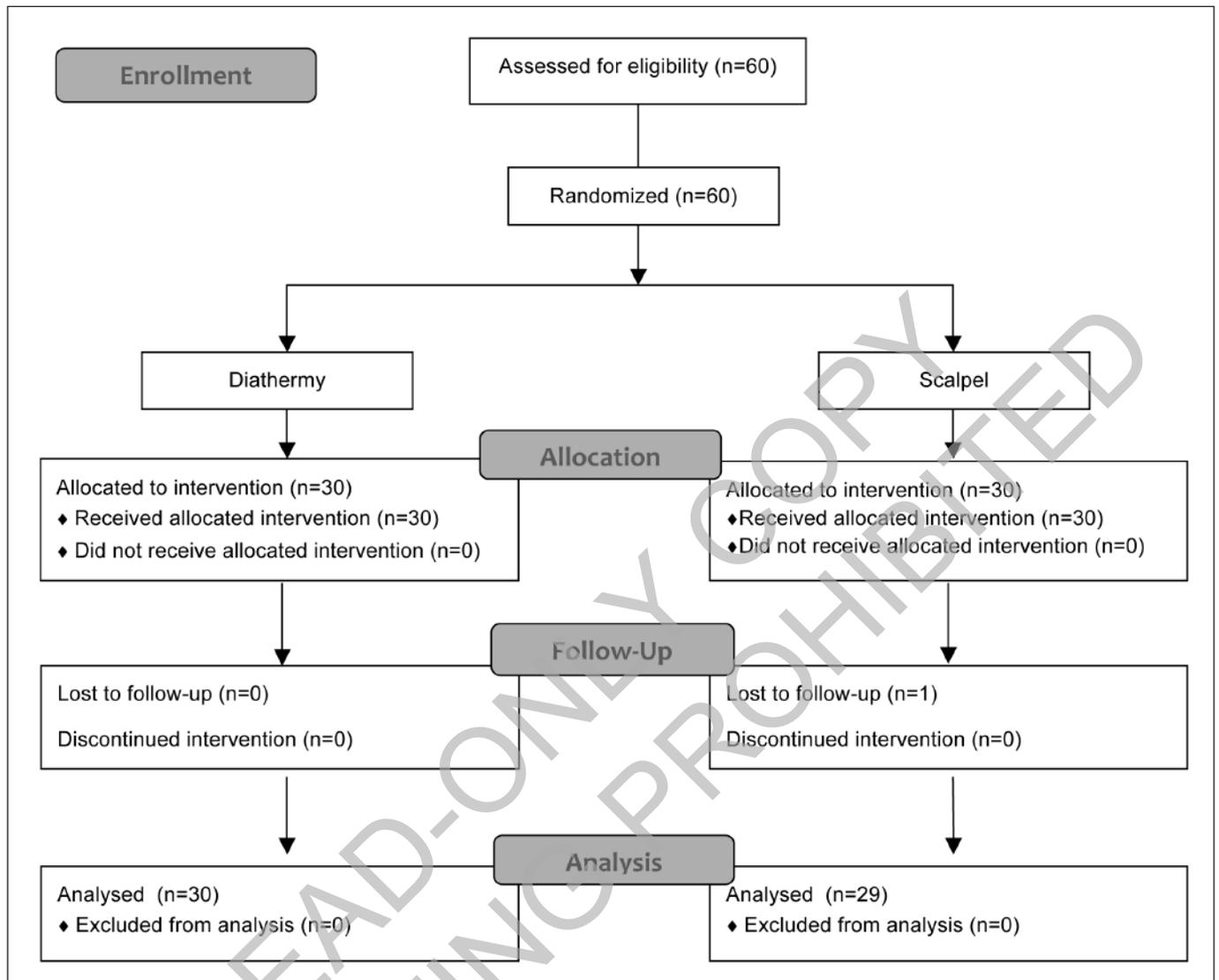
Of all patients were followed-up in the outpatient clinic. Seroma formations were observed in two patients (one for each group). Removal of a few sutures and drainage of the fluid were sufficient. The wounds of these two patients were closed spontaneously within two weeks.

There were no significant differences between groups in terms of duration to sit comfortably, return to daily activity and work (Table II). Median follow up period was 10 months (7-14 months) and recurrence of PSD was emerged in one patient in the diathermy group 3 months after the initial operation.

Discussion

Using diathermy for skin incisions and tissue dissections is not an uncommon practice. Studies comparing

TABLE 1 - Flow diagram



diathermy and conventional scalpel in abdominal incisions showed that using diathermy can reduce operation time and postoperative pain without any increase in wound infection rates^{5,6}. Ozdogan et al. observed that diathermy dissection in modified radical mastectomy reduced blood loss and total drain volume but increased seroma formation rate. Additionally, they found that tumor necrosis factor-alpha (TNF- α) levels were increased in diathermy group⁷. In the available literature, the only study comparing diathermy and scalpel in PSD was reported by Duxbury et al. The authors performed 'excision with open packing procedure' as the surgical procedure for the treatment of PSD. They found that diathermy excision was associated with low postoperative pain and earlier mobilization. They commented that this may be a consequence of the full thickness burn produced by diathermy. The other advantages of

diathermy were reduced length of operation, and diminished analgesia requirements following surgery⁸. In surgical treatment of PSD, various procedures are in use. Of these, most commonly used ones are excision with primary closure, wide excision with open packing or semi-open packing, marsupialization, and recently, flap repairs following wide excision^{9,10}. RELIF procedure is a recommended flap technique due to shorter hospitalization period, earlier wound healing and recovery time with low recurrence rates. Providing these criteria, RELIF procedure represents an excellent approach for the treatment of PDS¹¹. Although there are many reports on the RELIF procedure in the literature, there has not been any study conducted comparing diathermy and conventional scalpel. This study demonstrates that using diathermy dissection in rhomboid excision and Limberg flap preparation in pilonidal sinus treatment is safe. Shorter operation times

TABLE II - Clinical outcomes

	Diathermy (n=30)		Scalpel (n=29)		P
	Mean(SD)	Median(range)	Mean(SD)	Median(range)	
Age (year)	25.30(6.13)	25(17-40)	27.03(8.15)	27(18-44)	0.35
Gender (f/m)(n)		3/27		2/27	0.67
Type of disease (primer/recurrent)(n)		25/5		22/7	0.48
Operation duration (min)	36.55(7.20)	35(25-50)	57.33(7.73)	60(40-70)	0.0001
Total drain output (ml)	53.27(35.93)	50(10-160)	50.40(26.20)	45(10-120)	0.24
Drain removal time (d)*	1.75(0.78)	2(1-4)	1.76(0.62)	2(1-3)	0.75
Length of hospital stay (d)*	1.75(0.78)	2(1-4)	1.76(0.62)	2(1-3)	0.75
Pain scores(NPIS scores)					
Day 1 (Total score over first 24h)	4.69(2.41)	4(3-12)	6.90(2.71)	7(3-12)	0.001
Day 3	1.17(0.60)	1(1-4)	1.53(0.73)	1(1-3)	0.11
Day 7	0.93(0.25)	1(0-1)	0.93(0.25)	1(0-1)	0.97
Quality of Life					
Return to daily activity (d)	8(2.68)	7(1-15)	7.76(1.99)	7(3-14)	0.83
Return to work (d)	20.51(5.53)	20(10-30)	21.96(5.10)	20(14-30)	0.26
Duration until comfortably sitting (d)	8.96(3.58)	7(5-20)	9.03(2.89)	10(4-20)	0.4
Wound complications					
Seroma formation (n)	1		1		-
Recurrence of disease (n)	1		-		-

*Drain removal times and length of hospital stays were equal. SD: Standard deviation

and lower postoperative pains during first 24 hours were significantly associated with diathermy compared scalpel. There was no significant difference between both techniques in terms of wound complications and recurrence rates. Also, we have not encountered any flap necrosis or circulation insufficiency neither in scalpel group nor in diathermy dissection as the device was set to cutting mode at 50 watts.

Conclusion

This study showed that diathermy dissection in RELIF procedure in pilonidal sinus surgery is a safe technique. However, limited number of patients in our study prevents us from bringing strong suggestions regarding complication rates. It is apparent that more studies with large series are required. We suggest this technique due to its advantages including decreased operation time, reduced blood loss and postoperative pain.

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Riassunto

L'escissione romboidale e la riparazione con il lembo di Limberg (RELIF) è una procedura chirurgica efficace nella terapia del *sinus pilonidalis* (PSD). Con il presente studio ci si è proposti di paragonare il risultato dell'intervento eseguito con bisturi diatermico e con bisturi freddo.

Si è proceduto alla randomizzazione i pazienti sottoposti a procedura secondo Limberg (RELIF) presso il Adana Numune Training and Research Hospital tra il gennaio ed il settembre 2012, assegnandone 30 alla procedura con bisturi diatermico e 30 alla procedura con bisturi freddo. I parametri considerati per valutare i risultati sono stati la durata dell'intervento, l'entità del drenaggio, intensità del dolore postoperatorio misurato con la scala di intensità dolorifica ((NPIS), le complicanze, la durata della degenza ospedaliera e l'intervallo prima di tornare alle proprie occupazioni giornaliere.

L'età media dei pazienti è di 16,2 anni (da 17 a 44 anni), la durata media dell'intervento è stata significativamente minore nel gruppo della diatermia ($p=0.0001$). Il grado NPIS del dolore postoperatorio entro le prime 24 ore è stato significativamente minore nel gruppo diatermico ($p=0,001$). Comunque non vi sono state differenze sostanziali in termini di NPIS in 3^a e 7^a giornata. Non vi sono state differenze nell'entità del drenaggio, di rimozione del drenaggio e durata della degenza. Non vi

sono state differenze significative tra i due gruppi nei tempi di tornare a sedersi senza disagio, ritorno alle normali attività ad al lavoro. La recidiva della patologia si è avuta in un solo paziente del gruppo della diatermia. Si conclude che la diatermia per il trattamento chirurgico di questa patologia è una tecnica affidabile, che comporta una minore durata dell'intervento e del dolore postoperatorio.

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