

# The comparison of electrocautery and curettage of the nailbed for the treatment of ingrown toenail

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**Abstract.** The ingrown toenail is a condition of the active young population that often seriously impairs the patient's comfort, causing distress to walk, which is seen in the second and the third decades. We aimed to compare two different treatment techniques for that disease.

A total of 80 patients who underwent surgery, using the Winograd technique, due to an ingrown toenail were included. The mean age of the patients was 29 (21-44) years. There were 32 female (40.0%), and 48 male (60.0%) patients. The patients were divided into two groups: Group I (n=40) is consisted of patients in whom electrocautery was applied during the surgery, whereas curettage was done in Group II (n = 40). Recurrence and infection rates were compared.

The statistical analysis revealed no significant difference between the two groups in terms of recurrence, and infection rates ( $p > 0.005$ ).

Our results showed that there is no superiority of one of these methods to the other in terms of the recurrence, and infection rates.

Key words: Ingrown toenail, winograd, matricectomy, curettage, electrocautery

## 1. Introduction

The ingrown toenail is a condition of the active young population that often seriously impairs the patient's comfort, causing distress to walk, which is seen in the second and the third decades (1). Patients often admit tissue to the hospital complaining of pain in the nail and in the surrounding tissue (Figure 1). If it remains untreated, it usually gets infected (2). There are a large number of options for surgical treatment, for the patients who cannot be treated with conservative methods. The treatment methods can be planned according to the stage of the disease (3). Chemical cauterization of the nail bed (4,5), CO<sub>2</sub> laser matricectomy (6), partial excision of

the nail bed (7) are now widely used techniques. Winograd technique (8) is frequently applied in practice. It involves the excision of the hypertrophic part of the affected nail with a partial matricectomy. In the surgical treatment of the ingrown toenail, the minimum frequency of recurrence is targeted. In this study, postoperative recurrence rates and early infection rates were compared between electrocautery group and curettage group for evaluate superiority of treatment methods.

## 2. Material and methods

The prospective study was initiated after obtaining approval from the Board of Ethics, University of Gaziantep. A total of 80 patients who underwent surgery, using the Winograd technique, between June 2011 and June 2012 at the Gaziantep University Hospital, and the Şehitkamil State Hospital, Departments of Orthopedics and Traumatology, due to an ingrown toenail were included. The ingrown toenail has three clinical phases depending on the severity (3). In stage I, there is erythema, edema and pain at the edge of the nail. In stage II, there

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is an increased pain and would discharge with a bacterial paronychia-like appearance at the edge of the toenail. Stage III consists of granulation and hypertrophy at the edge of the nail. All patients were in stage II and stage III. The mean age of the patients was 29 (21-44) years. There were 32 female (40.0%), and 48 male (60.0%) patients. The patients were divided into two groups: Group I (n=40) is consisted of patients in whom electrocautery was applied during the surgery, whereas curettage was done in Group II (n=40). All patients were treated with oral amoxicillin-clavulanic acid 2x1000 mg for 7 days before the surgery.

### 2.1. Surgical technique

Digital block anesthesia was performed in all patients in the operating room after the local site clearance with povidine-iodide. A finger tourniquet was placed after adequate anesthesia. This provided a better field of vision and a clean working field. In both groups, as part of the Winograd technique, the nail bed under the affected nail was removed with the help of a

longitudinal incision to the tip of the nail. The granulation in the surrounding soft tissue was excised with an elliptical incision. In Group I, the affected part of the nail bed was electrocauterized (Figure 2). The patients in Group II underwent curettage. In patients in both groups, after the matricectomy, the wound bed was rinsed and 2-0 nylon sutures were placed proximally and distally at the surgical site (Figure 3). A soft bandage was applied.

### 2.2. Follow up

Postoperative antibiotic therapy was continued for 24 hours. Oral preparations, such as paracetamol 500 mg was used for analgesia, if necessary. The sutures were removed on the 14<sup>th</sup> day. The patients were evaluated for infection up to 4 weeks. Recurrences were recorded up to 6<sup>th</sup>, 12<sup>th</sup> and 18<sup>th</sup> months.

### 2.3. Statistical analysis

For the statistical evaluation of the recurrence rates and infection rates the Chi-Square test and the Fisher's Exact Test were used. A P value <0.05 was considered significant.



Fig. 1. Ingrown toenail and surrounding granulation.



Fig. 2. Electrocauterisation of nailbed.



Fig. 3. Clinical view of nail after surgery.

### 3. Results

In the period before the sutures were retrieved, a superficial infection was detected in three patients in Group I and in two patients in Group II. These patients were treated with oral amoxicillin-clavulanic acid 1000 mg, twice daily for seven days. At the end of the antibiotic therapy, the signs of infection improved in both groups.

There was no recurrence in both groups at the end of the 6<sup>th</sup> month.

At the end of the 12<sup>th</sup> month, 2 patients (5%) in Group I and 3 patients (7.5%) in Group II had a recurrence. The patients with recurrence were treated with the same surgical technique as in the initial treatment. Matricectomy with chemical agents wasn't used in cases of recurrence.

Determined in accordance with the surgical technique in patients with recurrence, re-revision was performed earlier.

At the end of the 18<sup>th</sup> month, there was no evidence of recurrence in both groups.

The statistical analysis, which was performed at the end of the study revealed no significant difference between the two groups in terms of recurrence and early infection rates ( $p > 0.05$ ).

### 4. Discussion

Ingrown nail is a painful condition which can even encumber walking, and can be severe enough to cause loss of labor (9). There are a large number of conservative and surgical treatment options. Although the surgical techniques were more preferred in the past, conservative methods of treatment have become more popular, in recent years (10). Determination of the phase of the disease is required when the treatment plan is to be made (3). The widespread opinion is conservative treatment for patients with stage I, and surgical treatment for the other phases. We treat the patients who do not respond to conservative treatment and the patients beyond stage I surgically. Gutter splint application (11), application of a cotton swab at the edge of the nail (12) and application of nail brace (13) are used as popular methods of conservative treatment. In patients with stage II, due to the discharge and the accompanying nail bed infection, the use of topical and oral antibiotics gain importance and surgical treatment should be carried out.

In patients with stage III, primarily surgical treatment is preferred, because of the granulation and the hypertrophy of the nail bed. We also prefer the surgical treatment methods for stage II and stage III patients.

Partial or total excision of the nail and the matricectomy are the preferred surgical treatment methods. Persichetti has reported that matrix resection with mechanical methods (curette) is an effective method with a small number of complications (7). When the partial resection of the nail is preferred, a decreased frequency of relapse was reported by chemical matricectomy (14). Chemical substances such as alcohol and phenol are usually used for matricectomy. We did not choose to use any chemical substances.

We apply the Winograde method in our clinic for patients with stage II and stage III disease (8). With this method, it was also possible to correct the aesthetics of the toenail, especially in patients with grade III disease. In this study, at the final stage of the surgery, in order to remove the residual tissue matrix on the lateral nail wall and the distal phalanx, electrocautery was applied in Group I, and curettage was performed in patients in Group II.

The electrocautery is known to provide an excellent homeostasis, a low recurrence and infection rate, and less pain. Although the thermal destruction of the superficial tissues is a possible complication, this can be minimized by Teflon coated cautery applications. Mechanical curettage is also convenient method as effective as the electrocauterization, and there is no risk of thermal burns.

Aim of this study was to compare the recurrence rates and infection rates of these methods. Our results showed that there is no superiority of one of these methods to the other in terms of the recurrence rates and infection rates. The findings in the literature have supported these results. In this context, the orthopedists should prefer the method that they are familiar with, when planning the treatment. In addition, the curettage seems to be more cost-effective compared to the electrocautery.

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