Research Article / Araştırma Makalesi

Surgical Treatment of Ingrown Nail Without Matricectomy in Adults

Erişkinlerde Tırnak Batmasının Matriksektomisiz Cerrahi Tedavisi

Ahmet Yiğit KAPTAN [1], Selçuk KORKMAZER [1], Toygun Kağan EREN [2], İbrahim KAYA [3], Murat ÇİÇEKLİDAĞ [3], Turan BAL [4], Özlem ORHAN [5]

[1] Dr. Sami Ulus Obstetrics and Gynecology Training and Research Hospital, Orthopedics and Traumatology Clinic, Ankara, Turkey
[2] Ankara Training and Research Hospital, Department of Orthopedics and Traumatology, Ankara, Turkey
[3] Gazi University Faculty of Medicine, Department of Orthopedics and Traumatology, Ankara,Turkey
[4] Harran University Faculty of Medicine Hospital, Department of Orthopedics and Traumatology, Şanlıurfa, Turkey
[5] Şanlıurfa Training and Research Hospital, Department of Orthopedics and Traumatology, Şanlıurfa, Turkey

Background: Ingrown toenail is an important foot problem that requires surgical treatment in advanced stages. Many surgical methods have been reported for treatment. The aim of this study was to evaluate the results of ingrown toenail surgery without matricectomy performed in patients with advanced stage ingrown toenails.
Materials and Methods: Twenty two patients were included in the study. Visual analog scale (pain / satisfaction) was applied to all patients before and after shoe wearing, and the patients were questioned regarding the timing of shoe wearing without discomfort.
Results: Preoperative VAS (pain) score was significantly improved from 8.2±1.1 to 2.4±1.2 after shoe wearing ($p<0.05$). The mean timing for shoe wearing without discomfort was 13.3±2.7 day after the surgery. Recurrences were found in two patients (7.1%). Nail dystrophies and nail growing problems were not seen during follow-up.
Conclusions: Successful results can be obtained in advanced stage patients with ingrown toenail surgery without matricectomy, care should be taken to make adequate soft tissue excision to reduce recurrence.

Key Words: Ingrown toenail, Matricectomy, Nail dystrophy

ÖZ.

Amaç: Tırnak batması ileri evrelerde cerrahi tedavi gerektiren önemli bir ayak problemidir. Tedavi için birçok cerrahi yöntem bildirilmiştir. Bu çalışmanın amacı, ileri evre ayak tırnakları batık hastalarda matriksektomi yapılmadan batık ayak tırnağı ameliyatının sonuçlarını değerlendirmektir.
Materyal ve Metod: Çalışmaya 22 hasta dahil edildi. Tüm hastalara cerrahi öncesi ve sonrasında ayakkabı giyebildiklerinde görsel analog skala (ağrı / memnuniyet) uygulandı ve hastaların rahatsızlık duymadan ayakkabı giyme zamanlaması sorgulandı.
Bulgular: Preoperatif VAS (ağrı) skoru ayakkabı giyebildikten sonra 8.2 ± 1.1'den 2.4 ± 1.2'ye anlamlı olarak düzeldi ($p<0.05$). Rahatsızlık olmadan ayakkabı giyme zamanlaması ameliyattan sonra 13.3 ± 2.7 gün idi. İki hastada (% 7,1) rekürrens saptandı. Takipte tırnak distrofileri ve tırnak uzama problemleri görülmedi.
Sonuç: Matriksektomi yapılmadan tırnak batması cerrahi uygulanan ileri evre hastalarda başarılı sonuçlar alınabilir, rekürrensi azaltmak için yeterli yumuşak doku eksizyonu yapmaya özen gösterilmelidir.

Anahtar kelimeler: Tırnak batması, Matriksektomi, Tırnak distrofisi

Corresponding Author/Sorumlu Yazar

Dr. Ahmet Yiğit KAPTAN
Dr. Sami Ulus Obstetrics and Gynecology Training and Research Hospital, Orthopedics and Traumatology Clinic, Ankara, Turkey

E-mail: dryigitkaptan@gmail.com

Received / Geliş tarihi: 27.08.2021

Accepted / Kabul tarihi: 15.09.2021

DOI: 10.35440/hutfd.987938

Introduction

Ingrown toenail is a common foot pathology regarding young adults (1). The pathology arises from the penetration of the nail plate into the periungual tissue, which causes infection and inflammation. Ingrown nail can limit daily activities as it causes severe pain, inflammation and discharge. Wearing tight shoes and inappropriate cutting of the nail were blamed as the main factors in the development of ingrown toenail (2).

Many methods which involve partial nail matricectomy and germinal matrix ablation have been described in the surgical treatment of ingrown nail (3-5). However, nail matricectomy and germinal matrix ablation may cause additional morbidity, such as vascular and soft tissue damage and may led to complications such as necrosis, and poor cosmetic results (1). In this study, we aimed to report the results of surgical method in ingrown nail without matricectomy and ablation of germinal matrix.

Materials and Methods

The study protocol was approved by Dr. Sami Ulus Obstetrics and Gynecology Training and Research Hospital Ethics Committee (22/10/2020 E-20/10-002). A written informed consent was obtained from each patient. The study was conducted in accordance with the principles of the Declaration of Helsinki. 28 nails of 22 patients (Ten female and 12 male patients between the ages of 18-51, mean 27.5 ± 1.6 years old) who were treated for stage-3 and stage-4 ingrown nail between September 2018 and January 2020, were included in the study. The surgery applied for nail anomalies, and revision surgery were not included in the study. Visual analog scale (pain / satisfaction) was applied to all patients before and after shoe wearing, and the patients were questioned regarding the timing of shoe wearing without discomfort.

Surgical Technique

The patient is positioned in supine position and mechanical cleaning was performed with soap and water scrub. Povidone-iodine solution was applied to the skin of the extremity, the skin is blotted and sterile dressings were applied. Digital block was applied with 1% lidocaine without epinephrine. After applying the finger tourniquet, the skin folding and soft tissue to be excised was marked with a surgical pen and the fibrotic tissue around the nail was excised (Figure 1A). Bilateral wedge shape soft tissue surrounding the nail plate was then removed preserving the nail bed and nail matrix (Figure 1B,C). The part of the nail plate penetrating the nail folding was excised. The wound was closed using 3-0 polypropylene sutures and dressed (Figure 1D).

Results

The patients were staged according to classification reported by Martinez-Nova et al (6). There was 20 stage-3 ingrown nail and eight stage-4 ingrown nail. The follow-up interval was between 6-24 months and the mean follow-up duration was 12.7±4.6 months. Preoperative VAS(pain) score was significantly improved from 8.2±1.1 to 2.4±1.2 after shoe wearing ($P<0.05$). The mean timing for shoe wearing without discomfort was 13.3±2.7 day after the surgery. The VAS score for satisfaction after shoe wearing was 8.1±1.7. Recurrences were found in two patients with stage-4 and stage-3 ingrown nail (7.1%). They were operated with same method after recurrence. Nail dystrophies and nail growing problems were not seen during follow-up.

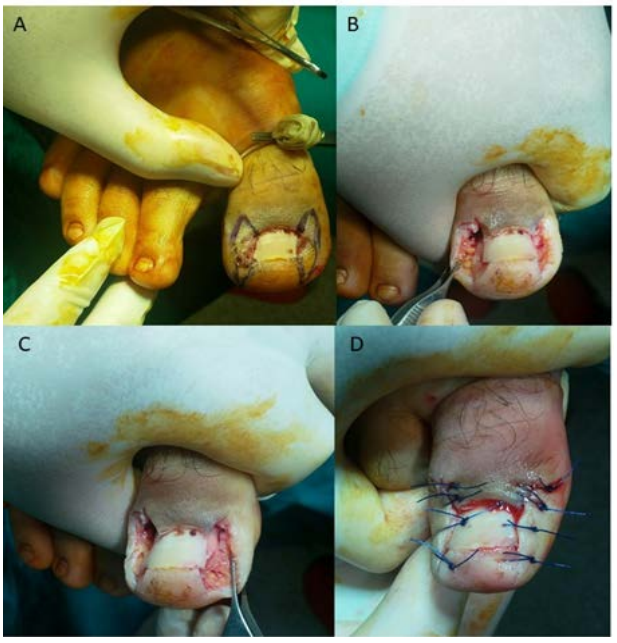

Figure 1. Surgical technique of ingrown nail without matricectomy. (*A) Marking the surgical excision area, (B, C) Soft tissue excision on both sides of the nail plate without matricectomy, (D) Wound closure with 3-0 polypropylene sutures.*

Discussion

It has been reported that recurrence is high in patients with advanced stage ingrown nail when matricectomy is not applied in the literature (2). However, matricectomy may cause some complications related to nail growth and dystrophy (Figure 2A,B). Recently, the methods in which the anatomy of the nail is preserved without matricectomy are reported to increase patient satisfaction after surgery in advanced stage ingrown nail with low recurrence rate (1,7). The main finding of this study is ingrown surgery without matricectomy gives good results in patients with advanced stage ingrown nail.

Noël (1) operated 23 ingrown nail patients and removed the wedge shaped ellipse soft tissue on both sides of nail and the excision line did not contain the nail plate. He reported excellent cosmetic results and no recurrences were observed in minimum fallow-up period of 12

months. Dabrowski and Litowinka (7) also reported high satisfaction scores after an average of 11.6 months of follow-up of 54 ingrown toenail surgeries with modified Noël method.

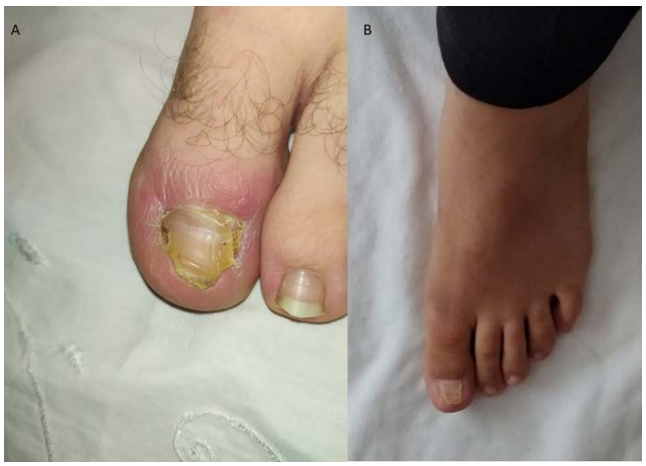

Figure 2. (*A) Nail growth affected in a 23-year-old male patient after nail matricectomy, (B) Nail dystrophy in a 27-year-old female patient after nail matricectomy.*

In this study, they reported recurrence in only 1 patient. We modified Noël's method and partial nail plate excision was applied in the present study. We preserved nail matrix and soft tissue excision was applied to all patients as described by Noël (1). Differently, recurrence occurred in two patients and they were operated with same method after recurrence. The recurrence rate reported in this study was higher than the rates reported by Noël (1) and Dabrowski and Litowinka (7). We think that the reason for recurrences may be insufficient soft tissue excision which is crucial part of this technique.

There are many authors who reported that matricectomy prevents recurrences in ingrown nail (6,8-11). Martinez-Nova et al. (6) proposed a treatment algorithm according to grades. Stage I (inflammatory), stage IIa (nail fold exceeds the nail plate < 3 mm), stage IIb (nail fold exceeds the nail plate > 3 mm), stage III (granulomatous or hypertrophic tissue widely covers the lateral nail plate.), and stage IV (hypertrophic tissue completely covers lateral, medial, and distal nail plate). They suggested Winograd method for stage-3/4 patients and phenol matricectomy for adults. We used their classification method and included stage 3-4 patients in the present study. However, we preferred not to add matricectomy as described by Noël (1). We thought that excision of the soft tissues that cause inflammation around the nail plate would be sufficient to prevent recurrences. In addition, maintaining nail anatomy and function with this method helped to prevent complications (Figure 3A,B).

An important factor affecting patient satisfaction in ingrown toenail surgery is the time that patients can wear shoes without discomfort. The short duration of this period allows patients to return to daily life and start working. Noël (1) reported all patients except 2 were able to wear shoes after 2 weeks.

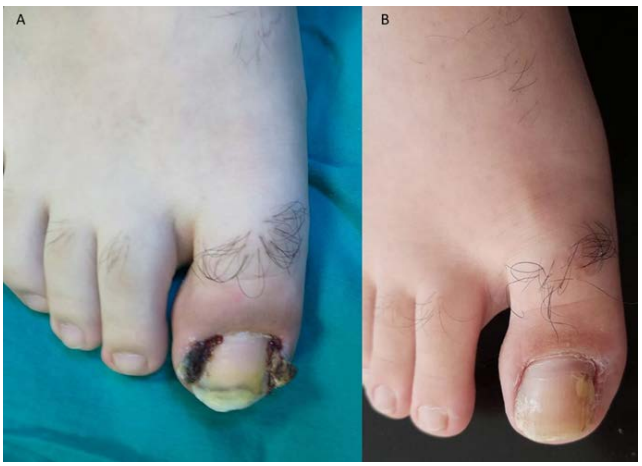

Figure 3. (*A) 19-year-old male patient with ingrown nail, (B) Six months after ingrown nail surgery without matricectomy.*

In this study, we also found this period was approximately 2 weeks (13.3±2.7). The length of this time may depend on the method we applied, but we could not find any other methods in the literature to compare this time. We applied VAS pain and satisfaction scores after the patients could wear shoes. Because, we have seen that even if there is no recurrence of ingrown toenails after surgery, patients can feel discomfort after wearing shoes. As a result, a significant improvement was achieved in the mean VAS pain score and the VAS satisfaction score was found 8.1 ± 1.7. We think that satisfactory results after wearing shoes may be related to bilateral soft tissue excision.

This study have some limitations. First of all, the study has retrospective design and limited number of patients. Second, there was no group of patients treated with a different method to compare the results of the surgical method. However, in conclusion, we can state that the main success of this method, which Noël reported and applied to patients with stage 3-4 by us in the present study, depends on adequate bilateral soft tissue excision. Preserving nail anatomy and as a result the absence of complications such as nail growth disorders and nail dystrophy is the most important advantage of this method.

Ethical Approval: *The study protocol was approved by Dr. Sami Ulus Obstetrics and Gynecology Training and Research Hospital Ethics Committee (22/10/2020 E-20/10-002).*

Author Contributions:
Concept: A.Y.K., S.K., T.K.E.
Literature Review: A.Y.K., T.K.E., Ö.O.
Design : A.Y.K., İ.K., M.Ç., T.B.
Data acquisition: S.K., T.K.E.
Analysis and interpretation: A.Y.K., S.K., T.K.E.

Writing manuscript: A.Y.K., S.K., T.B.
Critical revision of manuscript: Ö.O., T.B., İ.K., M.Ç.
Conflict of Interest: The authors have no conflicts of interest to declare.
Financial Disclosure: Authors declared no financial support.

References

1. Noël B. Surgical treatment of ingrown toenail without matricectomy. Dermatol Surg 2008; 34(1): 79-83.
2. Küçüktaş M, Kutlubay Z, Yardimci G, Khatib R, Tüzün Y. Comparison of effectiveness of electrocautery and cryotherapy in partial matrixectomy after partial nail extraction in the treatment of ingrown nails. Dermatol Surg 2013; 39(2): 274-80.
3. Aydin N, Kocaoglu B, Esemenli T. Partial removal of nail matrix in the treatment of ingrown toe nail. Acta Orthop Traumatol Turc 2008; 42: 174–7.
4. Kruijff S, Van Det RJ, Van der Meer GT, et al. Partial matrix excision or orthonyxia for ingrown toenails. J Am Coll Surg 2008; 206: 148–53.
5. Tatlican S, Eren C, Yamangokturk B, Eskioglu F. Chemical matricectomy with 10% sodium hydroxide for the treatment of ingrown toenails in people with diabetes. Dermatol Surg 2010; 36: 219–22.
6. Martínez-Nova A, Sánchez-Rodríguez R, Alonso-Peña D. A new onychocryptosis classification and treatment plan. J Am Podiatr Med Assoc 2007; 97(5): 389-93.
7. Dąbrowski M, Litowińska A. Recurrence and satisfaction with sutured surgical treatment of an ingrown toenail. Ann Med Surg (Lond) 2020;56:152-60.
8. Persichetti P, Simone P, Li Vecchi G, Di Lella F, Cagli B, Marangi GF. Wedge excision of the nail fold in the treatment of ingrown toenail. Ann Plast Surg 2004; 52(6): 617-20.
9. Ozdemir E, Bostanci S, Ekmekci P, Gurgey E. Chemical matricectomy with 10% sodium hydroxide for the treatment of ingrowing toenails. Dermatol Surg 2004; 30(1): 26-31.
10. Acar E. Winograd Method Versus Winograd Method With Electrocoagulation in the Treatment of Ingrown Toenails. J Foot Ankle Surg 2017; 56(3): 474-77.
11. Terzi E, Guvenc U, Tursen B, Tursen U, Kaya TI. The Effectiveness of Matrix Cauterization With Bichloracetic Acid in the Treatment of Ingrown Toenails. Dermatol Surg 2017; 43(5): 728-33.