

Chemical or Surgical Treatment in Ingrown Toenails? Practical Issues from a Case Series

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ARTICLE HISTORY

Received: April 3, 2019

Accepted: June 25, 2019

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ABSTRACT

Introduction: An ingrown toenail is a serious medical problem that cannot be overlooked, and the decision of choosing between conservative versus surgical treatment may be difficult in daily practice. **Case series presentation:** We present the cases of two young men with a long history of ingrown toenails, previously treated by complete nail avulsion, numerous topical applications of antibiotics, and 5% silver nitrate, successfully treated with caustic chemical agents, compared to a 19-year-old athlete with debilitating pain, intense inflammatory changes, infection, granulation tissue induced by skin penetration of lateral nail edge by an incurved toenail, in whom surgical treatment was needed. **Conclusion:** Chemical matricectomy in the absence of any surgical intervention, along with patience allowing the nail to grow, could be an option that is easy to perform in case of ingrown nails. However, the selection of cases is important, taking into balance the benefit-risk ratio.

Keywords: ingrown toenail, chemical matricectomy, surgical treatment

INTRODUCTION

An ingrown toenail is a serious medical problem that cannot be overlooked, and the decision of choosing between conservative versus surgical treatment may be difficult in daily practice. We present two cases treated by 70% trichloroacetic acid (TCA) solution, a caustic chemical agent, applied weekly, in comparison to a case that required surgical intervention.

All patients consented to publication of their data, and all the examinations were performed in accordance to the principles stated in the Declaration of Helsinki.



FIGURE 1. Case 1 before treatment



FIGURE 2. Case 1 at the end of treatment

CASE SERIES PRESENTATION

Case 1

A young man with a long history of ingrown toenail stage 3, previously treated by complete nail avulsion, numerous topical applications of antibiotics, and 5% silver nitrate, addressed us searching a totally noninvasive approach to his condition. The patient had no incurved toenail, but he used to perform an improper nail cutting technique deeply into the lateral edge of the nail. At the moment of clinical examination, the lateral edge of the nail was situated at 2/3 of the distance from the distal part of the nail plate (Figure 1).

A close follow-up, right fitting shoes, no cutting of the nails, a short topical antibiotic treatment (fusidic acid twice daily for seven days applied the day after TCA), and 70% TCA application once weekly were strictly recommended. No occlusive dressing, washing using just soap and water, patience, and weekly application of 70% TCA have been done for the following 5 weeks. Slight pain and erythema were described, especially in the first 24 hours after TCA application. However, no surgical technique was performed. The TCA solution was applied on the granulation tissue until white discoloration was observed and moderate pain was felt by the patient. Until the next TCA application fusidic acid cream was used once daily.

Good results were observed at the end of the 5-week period, with complete growth of the lateral margin of the nail plate and no signs of ingrown toenail (Figure 2).

Case 2

A 34-year-old man was seeking medical help because of discomfort and intense pain on the right toe caused by an ingrown toenail. At clinical examination it was observed that the nail plate had pierced the lateral nail fold, causing a foreign body reaction, infection, and intense granulation tissue on both lateral edges. The patient was a healthy person, with no anatomical abnormalities of the nail plate (Figure 3). This was his first visit to the doctor's office, no medical or surgical treatments have been done previously. Weekly application of 70%TCA was performed on the granulation tissue, followed by topical antibiotics. Slight erythema, desquamation, and minor pain were reported during therapy. After a 5-week period, a small granulation tissue persisted on the left nail fold, and one more application of 70%TCA was done (Figure 4).

Case 3

A 19-year-old athlete was seen in the Emergency Unit for debilitating pain, intense inflammatory changes, infection,



FIGURE 3. Case 2 – bilateral ingrown toenail

and granulation tissue induced by skin penetration of the lateral nail edge by an incurved toenail (Figure 5). Conservative treatment was denied, and the patient was sent to the Surgery Department for avulsion of the offending toenail border and the excision of any granulation tissue.



FIGURE 5. Case 3 – ingrown toenail with granulation tissue



FIGURE 4. Case 2 – clinical appearance after 5 applications of 70% TCA weekly

DISCUSSIONS

Ingrown toenail is a very painful and debilitating nail disease, commonly seen in young adults. It affects mostly young men, and it is caused by mechanical trauma, unfitted tight shoes, sharp cutting of the marginal edges of the nail plate, congenital abnormalities of the nail plate or associated with subungual exostosis or tumor, arthritis, onychomycosis, toe deformities.^{1,2}

Regardless of the cause, the lateral nail edge presses and penetrates into the nail sulcus, leading to intense pain, the formation of granulation tissue, and infection. Based on the clinical signs, three stages have been described: stage 1, represented by erythema, slight edema, and moderate pain declared by the patient, but only correlated to pressure applied on the lateral nail fold; stage 2, in which infection and spontaneous severe pain are added; and stage 3, in which we can observe the presence of granulation tissue.^{3,4}

The surgical approach, widely known and performed especially in Surgery Departments, includes nail avulsion, wedge resection, total nail bed ablation, soft tissue resection, partial nail avulsion, and chemical matricectomy.⁵ It is an invasive method that carries the risk of infection and recurrence (if destruction of the germinal matrix is not performed) and all the problems related to surgery. It is used especially in cases of nail deformities, like in case 3 from this small series.

During the last years, chemical matricectomy associated with partial nail avulsion has been brought to attention by its easy application, low morbidity, no risk of recurrence, and noninvasive nature.

Chemical matricectomy has been performed with phenol, sodium hydroxide, and trichloroacetic acid.^{6,7} Some reports of intense tissue destruction beyond the limits of granulation tissue and prolonged healing have been reported as side effects.⁶ Also, the application of phenol has induced digestive problems, cardiac arrhythmias, hemoglobinuria, and local chemical burns in some patients.⁸

Matricectomy with sodium hydroxide has eliminated some of the systemic adverse reactions caused by phenol application, but excessive tissue destruction can occur due to the liquefaction necrosis action of the drug, which is a strong alkali.⁹

TCA is a caustic chemical agent that produces coagulation necrosis, but without systemic reactions. Several studies have reported good results lately in treating ingrown nails with 100% TCA matricectomy after partial nail avulsion with low recurrence rate and minimal local side effects on long-term follow-up.^{10,11}

Some cases could be treated with 70% TCA applied once weekly, without any surgical intervention (partial nail avulsion, laser, electrocautery).

CONCLUSIONS

Chemical matricectomy with 70% TCA once weekly in the absence of any surgical intervention, along with patience allowing the nail to grow, could be an option that is easy

to perform in case of ingrown nails, similar to the first two cases in this series. However, the selection of cases is important taking into balance the benefit-risk ratio.

CONFLICT OF INTEREST

Nothing to declare.

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