Trichloroacetic acid matricectomy: a retrospective study

Matricectomia com ácido tricloroacético: estudo retrospectivo

ABSTRACT

Introduction: The treatment of ingrown nails can be conservative or more invasive, including surgical methods. Surgical treatment through matricectomy is the most effective and can be performed mechanically or chemically. Although phenol is the most commonly used agent, trichloroacetic acid has led to satisfactory results in the partial chemical matricectomy of ingrown nails.

Objective: To describe the use of trichloroacetic acid as an option to treat ingrown nails.

Methods: 33 patients were analyzed, with 37 ingrown nails subjected to matricectomy with 50% trichloroacetic acid following the partial exeresis of the nail plate. Acute phenomena were assessed in the immediate post-operative period. Treatment effectiveness regarding the recurrence of the ingrown nail in the treated site was assessed 7 to 24 months after the procedure.

Results: The treatment's success rate was 70.72%. Light post-surgical exudation, the absence of tissue necrosis and good healing process were observed.

Conclusion: Trichloroacetic acid matricectomy is an effective treatment for ingrown nails; it causes few side effects, is easy to perform and has good resolution rates.

Keywords: trichloroacetic acid; surgery; nails, ingrown.

RESUMO

Introdução: O tratamento da unha encravada pode ser conservador ou cirúrgico. O tratamento cirúrgico com matricectomia é o mais efetivo e pode ser realizado de forma mecânica ou química. Embora o fenol seja o agente mais utilizado, o ácido tricloroacético tem revelado bons resultados na matricectomia parcial química da unha encravada.

Objetivo: Demonstrar a utilização do ácido tricloroacético como opção no tratamento da unha encravada.

Métodos: Foram analisados 33 pacientes, totalizando 37 unhas encravadas que foram submetidas à matricectomia com ácido tricloroacético 50%, após exerese parcial da lâmina ungueal. Avaliaram-se os fenômenos agudos no período pós-operatório imediato e a efetividade do tratamento, em relação à recorrência de unha encravada no local tratado, após período variável de sete a 24 meses.

Resultados: A taxa de sucesso do tratamento foi de 70,27%. Observaram-se leve exsudação pós-cirúrgica, ausência de necrose tecidual e boa cicatrização.

Conclusão: A matricectomia com ácido tricloroacético apresenta poucos efeitos colaterais, é de fácil manuseio e tem boas taxas de resolutividade, podendo ser alternativa no tratamento da unha encravada.

Palavras-chaves: ácido tricloroacético; cirurgia; unhas encravadas.
INTRODUCTION

An ingrown nail is a painful condition that usually affects adolescents' and young adults' toenails, with a higher prevalence in men. They can be caused by incorrectly cut nails, inadequate shoes, trauma, hyperhidrosis, hypertrophic lateral fold and nail disorders.3,10

An ingrown nail develops in three phases. Phase 1 is characterized by pain, erythema and light edema. In phase 2, these symptoms are exacerbated and associated with exudation, with the possibility of local infection. Phase 3 involves the worsening of all these symptoms and the formation of granulation tissue and hypertrophia of the lateral fold of the nail. A more conservative treatment is recommended for Phase 1, while Phases 2 and 3 require a surgical approach.2,3,4

Although surgical matricectomy with suture presents a low reincidence rate and is considered effective at reducing the hypertrophia of the lateral nail border, it can present some disadvantages. It is difficult to perform, and it causes post-operative pain and bleeding, prolonged suspension of daily activities and unsatisfactory aesthetic results.3,5

Chemical matricectomy also presents a low reincidence rate, with a shorter healing period. During the last few years, phenol-based matricectomy has been the preferred method for treating ingrown nails. However, phenol can cause unexpected and extensive tissular damage, with excessive exudation.5 As a result, other chemical agents such as sodium hydroxide and trichloroacetic acid (TCA) have been used.1,6,7 The action of TCA is similar to that of phenol: it causes necrosis by coagulation of the cells through the extensive denaturation of proteins.3,8

There is only one report in the specialized literature mentioning the use of 100% TCA in the treatment of ingrown nails. The objective of the present study is to demonstrate the use of 50% TCA in matricectomy and, in this way, describe an additional option in the treatment of ingrown nails.

METHODS

A retrospective study involving records of patients who had undergone surgery for ingrown nails from February 2008 to July 2009 was carried out at the Onychopathy Outpatient Clinic of the Instituto Lauro de Sousa Lima, in the City of Bauru, São Paulo, Brazil. This study was approved by the Research Ethics Committee of the institution, and all procedures were performed by resident physicians under the supervision of a preceptor physician.

The study included 33 patients – 16 men and 17 women, totalling 37 ingrown nails in phases 2 or 3, almost all in the hallux. The patients' ages ranged from 11 to 84. Patients with ingrown nails associated with severe hyperplasia of the lateral nail fold were excluded from the study; they were treated with surgical matricectomy with suture, a method that reduces the hypertrophia more efficiently.

The study patients underwent partial matricectomy with 50% TCA, and were observed in the immediate post-operative period and followed up during 7 to 24 months.

SURGICAL TECHNIQUE

1 – Surgical glove fingers tied at the base of the toe as a tourniquet (Figure 1).
2 – Asepsis with 70º alcohol.
3 – Distal digital block with 2% lidocaine, without ephinephrine.
4 – Partial excision of the ingrown nail using a scalpel with a No 15 blade. The cut began in the distal part of the nail, towards the proximal part of the nail plate. A fragment of the nail was removed that was large enough to prevent a recurrence of the condition, while preserving the nail's appearance (Figure 2).
5 – Chemical destruction of the nail matrix with 50% TCA aqueous solution, applied with an adapted paper clip. The clip was extended straight, with a small amount of cotton attached to its tip (Figure 3). The TCA solution came into contact with the nail matrix for 2 cycles of 30 seconds each.
6 – Tourniquet removed.
7 – Bandage and analgesic prescription applied.
8 – Bandage changed 24 hours later by the patient at home (can be redone by the patient). Patients received instruction on daily asepsis with soap, followed by the application of topical antibiotic on the site and occlusion with gauze daily until the follow-up visits (7 and 15 days after), when the presence of exudation and tissular necrosis were observed.

EVALUATION

After the 7 to 24 months follow-up period, the reincidence of ingrown nails was evaluated (Figure 4).
STATISTICAL ANALYSIS

The statistical calculations were made with the aid of the software Graph Pad Instat. The results of the 50% TCA matricectomy were analyzed statistically with the non-parametric Wilcoxon test, with the number of ingrown nails before and after compared during intervals of 7 and 24 months after the procedure. Results were considered significant when $p < 0.05$.

RESULTS

33 patients (a total of 37 ingrown nails) underwent 50% TCA matricectomy. In the follow-up, only 11 patients presented reincidence, which was a 70.27% success rate (Table 1).

<table>
<thead>
<tr>
<th>CHARACTERISTICS</th>
<th>RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients, n</td>
<td>33</td>
</tr>
<tr>
<td>Matricectomized ingrown nails, n</td>
<td>37</td>
</tr>
<tr>
<td>Gender, n (%)</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>17 (51.5%)</td>
</tr>
<tr>
<td>Male</td>
<td>16 (48.5%)</td>
</tr>
<tr>
<td>Average age in years (range)</td>
<td>35.8 (11-84)</td>
</tr>
<tr>
<td>Average follow up period in months (range)</td>
<td>15.9 (7-24)</td>
</tr>
<tr>
<td>Procedure success rate, %</td>
<td>70.27*</td>
</tr>
</tbody>
</table>

* $p < 0.0001$.

DISCUSSION

Many surgical methods are available for the treatment of ingrown nails. However, the ideal technique should be performed under local anesthesia, be easy to execute, involve a fast healing process, a high success rate, a low cost and yield aesthetically acceptable results.1 Those requirements are more frequently met using chemical matricectomies with the partial avulsion of the nails.

Phenol is some authors’ preferred method, having a reincidence rate of 0 to 11%.1,3 Notwithstanding, this chemical agent presents an unforeseeable and extensive risk of tissular damage and excessive secretion. Besides, phenol can only be stored for short periods 9,10 and, even when used in small amounts, can cause systemic side effects such as abdominal pain, dizziness, hemoglobinuria, cyanosis and, more rarely, cardiac arrhythmias.11

In this study 50% TCA aqueous solution, which has the same action mechanism as phenol, 3 was used to treat ingrown nails. TCA has the advantage of being easy to store and is frequently used in other dermatological procedures.12 This chemical agent also causes minimal secretion after the procedure, which contributes to a lower risk of infection 3 and greater comfort for the patient.

A bibliographical review carried out by Kim and others demonstrated that there is no significant difference in the efficacy of 100% TCA when compared to phenol in the treatment of ingrown nails (95% and 95.8% efficacies for TCA and phenol, respectively). However TCA causes less pain and drainage of exudate in the post-operative period compared to phenol.3
In contrast to that described by Kim and colleagues, this study presented a success rate of 70.29% with 50% TCA. This success rate can be considered satisfactory, given that there were no complications and no need to prescribe systemic antibiotic therapy to any patient. Likewise, it is important to consider that the surgeries were performed by resident physicians who were learning the technique. These conditions, according to the literature, involve greater recurrence rates.13

CONCLUSION

Based on this study, it can be suggested that the TCA technique constitutes an additional option in the treatment of ingrown nails. It is easy to perform and there is low post-operative morbidity and few side effects.

In this context, the present study contributes to a better understanding of the benefits of TCA in the execution of matricectomies, encouraging new research efforts to establish the ideal concentration of TCA and the best duration of application on the nail matrix.●

ACKNOWLEDGEMENTS

We would like to thank Dr. Dejair Caitano do Nascimento, for the statistical analysis and general revision of the article.

REFERÊNCIAS