Research Paper

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Comparison of Electrocautary, Matrix Phenolization and Trichloro Acetic Acid in Treatment of Ingrown Toe Nail in Karnataka

Medical Science

KEYWORDS : Ingrown toe nail, Electro cautary, Phenolization, Trichloroacetic acid

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ABSTRACT

Background: Ingrown toe nail is the painful condition of the patients and precluding the routine activities of the patients. A variety of treatment methods are advocated in the treatment of ingrown toe nails. This study mainly focuses on comparison of three different methods in treatment of ingrown toe nails.

Materials and methods: A randomized trial was undertaken in the Department of General Surgery of a medical college in southern India. A total of 90 patients were randomized in to three groups. The predisposing factors were determined at first visit of all patients. About 30 patients treated by using elctrocautary, 30 patients were treated by matrix phenolization and 30 patients with trichloroacetic acid. The patients were followed up for a period of two years for the recurrence and success rates.

Results: Majority of the patients in three groups were males. Excessive trimming of the nail was the predisposing factor for ingrown toe nail. In the pre operatory evaluation, drainage was noticed in 80% in electro cautary group, 80% in surgery with phenol and 76.7% in trichloro acetic acid group had the drainage. About 53.3% in electro cautary patients, 56.7% in surgery with phenol and 43.3% in the trichloro acetic acid group had granulation tissue. After two years of follow up, about 83.3% of the patients in electro cautary group, 86.7% in surgery with phenol group and 80.0% in the tricholoro acetic acid group had success of the repair without the recurrence of ingrowing toe nail.

Conclusion: The application of chemical methods results in low recurrence, less post operative pain, less wound infection and spicule formation and decreases the recurrence rates with better patient outcome.

Introduction

Ingrown toe nail (Oncocryptosis) is annoying problem in surgical practice. It is mainly caused by the lateral nail edge compression on the underlying soft tissue and accounts for 20% of the patients seen by a family physician.[1] The disease mainly affects the adolescents and young adults than the other age groups, males than females and diabetics than the non diabetics. Big toe is mostly commonly affected by the ingrown toe nail than any other toes.[2] The ill fitting foot wear, Thick socks, soft tissue abnormalities of the toe, abnormal foot mechanics, excessive sweating (hyperhydrosis), incorrect practices of trimming nails, Thick nail folds and medial rotation of the hallux (eversion) and reduced nail thickness are the main reasons for the ingrown toe nail.[3, 4]

Several treatment modalities have been shown to be effective in treatment of the ingrown toe nail ranging from the conservative approaches to extensive surgical procedures.[5] The electro cautary and matrix phenolization was shown to be effective in treatment of ingrown toe nail with lowest recurrence rates and best cosmetic outcome. But the surgical and chemical methods are associated with high recurrence rate.[6] The literature existing comparing the three methods are scant. Hence, it was decided to compare the three methods for treatment of ingrowing toe nail.

Materials and methods

A randomized trial was undertaken in the Department of General Surgery of Basaveshwara Medical College and Hospital, Chitradurga. A total of 90 patients were randomized to three groups. The study was approved by the institutional ethics committee. The predisposing factors were determined at first visit of all patients. About 30 patients in the elctrocautary group were anesthetized by using lidocaine hydrochloride 20 mg/dl. A rubber band tourniquet was applied to the big toe. About 1/5th of the lateral nail plate is removed. The matrix area is exposed by performing a ½ cm incision at the corner of the affected nail. The granulation tissue is curetted and cauterized and the matrix area, using a Pencil probe of electrical cautary (MEDI Choice – Owen and Minor Richmond, VA). The incision is sutured with silk material and procedure is terminated by removal of the tourniquet. Topical antibiotics were applied and tourniquet was removed. A pressure dressing with a sterile pad was left in place for 24 hours. The phenol group of patients was applied with 88% of the phenol with rotation directed towards the lateral fold. The contact of the phenol with the surrounding skin was avoided and the treated area was carefully washed with 70% isopropyl alcohol to neutralize any residual phenol. In the third group, the surgical procedures included, proximal digital nerve block, hemostasis with tourniquet, granulation tissue curettage, lateral toenail plate and matrix lateral horn removal; and trichloroacetic acid (TCA) (80%) application on exposed nail bed and matrix for 5 seconds. The patients were followed up for a period of two years for the recurrence. The data thus obtained was entered in excel sheet and analysed using Statistical Package for Social Services (SPSS vs 20). Chi square test was applied to find the association between the three groups and Analysis of Variance was used as test of significance of the quantitative variables.

Results

The mean age of the patients in electro cautary, surgery with phenol and trichloroacetic acid groups was 32.6 (± 11.3), 34.0 (± 7.7) and 34.4 (± 11.6) years respectively. About 70% in the electro cautary group, 73.3% in the surgery with phenol and 80.0% in Trichloro acetic acid were males.

Table 1. Socio – demographic factors of the study groups

	Electro cautary	Surgery with phenol	Trichloro-acetic acid
Mean age (in years)	32.6 ± 11.3	34.0 ± 7.7	34.4 ± 11.6
Male [n (%)]	21 (70.0%)	22 (73.3%)	24 (80.0%)
Female [n (%)]	9 (30.0%)	8 (26.7%)	6 (20.0%)

About 53.3% of the patients in electro cautary group, 63.3% of the patients in surgery with phenol group and 66.7% of the patients in trichloro acetic acid group complained that the excessive trimming of lateral nail plate as predisposing factor. Plantar hyperhidrosis, heavy lateral nail folds, use of constricting foot wear, Thin nails, excessive curvature of nail plate and rotation of toe were the other pre disposing factors for the ingrowing toe nail.

Table 2. Predisposing factors of the study groups

Predisposing factors	Electro cautary n (%)	Surgery with phenol n (%)	Trichloro-acetic acid n (%)
Excessive trimming of the lateral nail plate	21 (53.3%)	19 (63.3%)	20 (66.7%)
Plantar hyperhidrosis	17 (56.7%)	13 (43.3%)	17 (56.7%)
Heavy lateral nail folds	14 (46.7%)	12 (40.0%)	11 (36.7%)
Use of constricting foot wear	10 (33.3%)	8 (26.7%)	9 (30.0%)
Thin nails	8 (26.7%)	11 (36.7%)	9 (30.0%)
Excessive curvature of the nail plate	5 (16.7%)	4 (13.3%)	6 (20.0%)
Rotation of the toe	6 (20.0%)	4 (13.3%)	6 (20.0%)

In the pre operatory evaluation, drainage was noticed in 80% in electro cautary group, 80% in surgery with phenol and 76.7% in trichloro acetic acid group had the drainage. About 53.3% in electro cautary patients, 56.7% in surgery with phenol and 43.3% in the trichloro acetic acid group had granulation tissue. About 23.3% in the patients of electro cautary group, 6.7% in the surgery with phenol and 10.0% in the trichloro acetic acid group had hemorrhage. Erythema was noticed in 6.7% of the electro cautary patients, 6.7% of the surgery with phenol group of patients and 6.7% in the trichloro acetic acid group.

Table 3.Pre operatory evaluation of the study groups

Pre – operatory evaluation	Electro cautary n (%)	Surgery with phenol n (%)	Trichloro-acetic acid n (%)
Drainage	24 (80.0%)	24 (80.0%)	23 (76.7%)
Granulation tissue	16 (53.3%)	17 (56.7%)	13 (43.3%)
Hemorrhage	7 (23.3%)	2 (6.7%)	3 (10.0%)
Erythema	2 (6.7%)	2 (6.7%)	2 (6.7%)

After two years of follow up, about 83.3% of the patients in electro cautary group, 86.7% in surgery with phenol group and 80.0% in the tricholoro acetic acid group had success of the repair without the recurrence of ingrowing toe nail. Spicule formation was noticed in 20.0% of the electro cautary, 13.3% of the surgery with phenol group and 23.3% in trichloro acetic acid noticed spicule formation and 10.0% in electro cautary group, 10.0% in surgery with phenol group and 13.3% in trichloro acetic acid group had recurrence of the ingrowing toe nail.

Table 4.Outcome of interventions for ingrowing toe nail

Two year follow up	Electro cautary n (%)	Surgery with phenol n (%)	Trichloro-acetic acid n (%)
Success	25 (83.3%)	26 (86.7%)	24 (80.0%)
Spicule	6 (20.0%)	4 (13.3%)	7 (23.3%)
Recurrence	3 (10.0%)	3 (10.0%)	4 (13.3%)

Discussion

This study was conducted to find the efficacy of different treatment methods for the ingrowing toe nail. In grown toenail is a painful condition which can hinder the day today work. A number of factors have been incriminated in the etiology of the ingrown toe nails. A number of theories also proposed in the etiology of the ingrown toe nails.[7] Male sex, excessive trimming of the mails, plantar hyperhidrosis, heavy lateral nail folds, use of constricting foot wear, Thin nails, excessive curvature of nail plate and rotation of toe were the predisposing factors in this study.

In this study, during pre operatory evaluation, drainage was noticed in 80% in electro cautary group and surgery with phenol and 76.7% in trichloro acetic acid group had the drainage. In a similar by using trichloroacetic acid, about 19% of the patients noticed after day 3 and 5% after day 30. About 53.3% in electro cautary patients, 56.7% in surgery with phenol and 43.3% in the trichloro acetic acid group had granulation tissue. About 23.3% in the patients of electro cautary group, 6.7% in the surgery with phenol and 10.0% in the trichloro acetic acid group had hemorrhage. Erythema was noticed in 6.7% of the electro cautary patients, 6.7% of the surgery with phenol group of patients and 6.7% in the trichloro acetic acid group.

After two years of follow up, about 83.3% of the patients in electro cautary group, 86.7% in surgery with phenol group and 80.0% in the tricholoro acetic acid group had success of the repair without the recurrence of ingrowing toe nail. Spicule formation was noticed in 20.0% of the electro cautary, 13.3% of the surgery with phenol group and 23.3% in trichloro acetic acid noticed spicule formation and 10.0% in electro cautary group, 10.0% in surgery with phenol group and 13.3% in trichloro acetic acid group had recurrence of the ingrowing toe nail. In a study by Karaca et al, partial nail plate avulsion combined with excision of lateral and proximal nail matrix and followed by phenolic ablation was found suitable surgical method for treating severe ingrown toe nails. They had also reported low recurrence rate and a success rate of 99.7% at 2 years.[8] The recurrence rate in a study by Ehsani et al, had found no recurrence after 4 months of follow up in both curettage and Phenol groups.[9] Electrocautary is known to provide a thorough hemostasis with low recurrence rate and infection rate and also less pain. The main drawback of the technique is destruction of the superficial tissue which can be minimized by using Teflon coated applications. The mechanical cauterization prevents these thermal burns and is superior than the electro cautary.[10] In a study by Terzi et al, the recurrence rate was 1.8% by using trichoroacetic acid at 12 months follow up.[11] Khan et al reported 1% recurrence after 7th day of follow up in phenol group compared with 4% in partial nail avulsion alone.[12]

Conclusion

The study mainly compared three different methods of treatment of ingrown toe nails. The Surgery with phenol group had high success rates compared to other two methods. The application of chemical methods also results in less post operative pain, less wound infection and spicule formation and decreases the recurrence rates with better patient outcome.

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REFERENCE

1. Peyvandi H, Robati RM, Yegane RA, et al. Comparison of two surgical methods (Winograd and sleeve method) in the treatment of ingrown toenail. Dermatol Surg. 2011;37(3):331-335. 2. Zuber TJ, Pfenninger JL. Management of ingrown toenails. Am Fam Phys. 1995;52(1):181-190. 3. Langford DT, Burke C, Robertson K. Risk Factors in Onychocryptosis. British Journal of Surgery. 1989; 76: pp45-48. 4. Lloyd-Davies R, Brill G. The Aetiology and Outpatient Management of Ingrowing Toenail. British Journal of Surgery. 1963; 50: pp 592-597. 5. Harrer J, Schöffl V, Hohenberger W, Schneider I. Treatment of ingrown toenails using a new conservative method: a prospective study comparing brace treatment with Emmert's procedure. J Am Podiatr Med Assoc. 2005;95(6):542-549. 6. Noel, B. Surgical Treatment of Ingrown Toenail Without Matricectomy. Dermatol Surg 2008;34:79–83. 7. Barreiros H, Matos D, Gaoulao J, Serrano P, Joao A, Brandao FM, Using 80% trichloroacetic acid in the treatment of ingrown toenails, An Bras Dermatol: 2013: 88: 6: 889 – 93. 8. Karaca N, Dereli T, Treatment of Ingrown toenail with proximolateral matrix partial excision and matrix phenolization, Annals of Fam Med, November/December: 2012:10: 6: 556 – 9. 9. Ehsani A, Noormohammadpour P, Balighi K, Ghandi N, Dabivaziri P, Azizahari S, Partial Matricectomy with curettage vs Partial Matricectomy with phenolization in the treatment of ingrown toe nail: A randomized controlled trial, Iran J Dermatol, 2009:12: 74 – 78. 10. Isik M, Cebesoy O, Subasi M, Karsli B, Topak D, Bilgin F, The comparison of electrocautery and curettage of the nail bed for the treatment of ingrown toe nail, Eastern Journal of Medicine, 2014: 19: 126 – 129. 11. Terzi E, Guvenc U, Tursen B, Kaya TI, Erdem T, Tursen U, The effectiveness of matrix cauterization with trichloroacetic acid in the treatment of ingrown toenails, Indian Dermatol Online J: 2015: Jan – Feb: 6: 1: 4 – 8. 12. Khan IA, Shah SF, Waqar SH, Abdullah MT, Malik Z, Zahid MA, Treatemnt of ingrown toe nail comparison of phenolization after partial nail avulsion and partial nail avulsion alone, J Ayub Med Coll Abbottabad 2014;26(4):522–5.