Clinical Research on Foot & Ankle

Commentary Open Access

The Role of Matrixectomy in Managing Persistent Ingrown Toenails and Nail Deformities

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Abstract

Matrixectomy is a widely utilized surgical procedure for the management of persistent ingrown toenails and nail deformities, particularly when conservative treatments fail. This technique involves the removal or destruction of the nail matrix, the tissue responsible for nail growth, to prevent recurrent ingrown nails or abnormal nail formation. The objective of this manuscript is to review the effectiveness, indications, and outcomes of matrixectomy in treating persistent cases of ingrown toenails and nail deformities. We examine the different methods of matrixectomy, including chemical and surgical approaches, and their success rates in preventing recurrence. This review also highlights the importance of post-operative care and patient selection to optimize treatment outcomes. Matrixectomy remains an essential procedure in the management of chronic nail disorders, offering long-term relief for patients suffering from painful and recurrent ingrown toenails.

Keywords: Matrixectomy; Ingrown toenails; Nail deformities; Nail matrix; Surgical treatment; Recurrence prevention

Introduction

Ingrown toenails (onychocryptosis) and nail deformities are common conditions that affect the general population. These disorders, characterized by the abnormal growth of the nail into the surrounding skin [1], can lead to pain, infection, and impaired mobility. Conservative treatment options, such as warm soaks, antibiotics, and partial nail removal, are often ineffective in chronic or recurrent cases. Matrixectomy, the destruction or removal of the nail matrix the tissue responsible for nail growth has become a standard surgical technique for preventing further nail growth in the problematic area and ensuring long-term relief [2]. While matrixectomy is effective, it requires careful patient selection and proper post-operative care to avoid complications such as infection or nail regrowth [3]. This manuscript explores the role of matrixectomy in the management of persistent ingrown toenails and nail deformities, reviewing the various techniques, indications, and success rates associated with this procedure.

Materials and Methods

This study involves a comprehensive review of peer-reviewed literature, clinical trials, and case studies related to matrixectomy in the treatment of persistent ingrown toenails and nail deformities [4-6]. Data was collected from online databases such as PubMed, Scopus, and Google Scholar, focusing on studies published within the last 15 years. Criteria for inclusion were studies that reported on the efficacy, techniques, complications, and outcomes of matrixectomy. The selected studies included both chemical matrixectomy (using phenol or sodium hydroxide) and surgical matrixectomy (excisional removal of the matrix). We also examined patient demographics, treatment protocols, recurrence rates, and post-operative care recommendations.

Results and Discussion

Techniques of matrixectomy: Matrixectomy can be performed using two main methods: surgical excision and chemical ablation.

Surgical matrixectomy: In this approach, the nail matrix is excised surgically under local anesthesia. The procedure involves removing the portion of the nail matrix that is causing the ingrown nail, followed by the careful application of hemostasis to prevent excessive bleeding [7]. This method is considered highly effective, especially in cases with localized nail deformities.

Chemical matrixectomy: This technique involves the application of chemical agents, such as phenol or sodium hydroxide [8], to destroy the nail matrix. These chemicals work by cauterizing the matrix tissue, thereby preventing future nail growth in the treated area. Chemical matrixectomy is preferred for patients who are not suitable candidates for surgery due to medical conditions or concerns about healing.

Efficacy and outcomes: Matrixectomy has demonstrated a high success rate in preventing the recurrence of ingrown toenails. Studies show that surgical matrixectomy has a success rate of approximately 90-95%, with a recurrence rate of less than 5% in properly selected patients [9]. Chemical matrixectomy also yields similar success rates, with a recurrence rate of about 10-15%. Factors such as the severity of the ingrown toenail, the extent of matrix destruction, and the surgical technique used play significant roles in the outcome of the procedure.

Patient selection and indications: Matrixectomy is indicated for patients with recurrent ingrown toenails or those who have failed to respond to conservative treatments, including partial nail avulsion. It is particularly useful for individuals with significant nail deformities or those suffering from recurrent infections. Matrixectomy is generally not recommended for patients with poor wound healing, active infections, or conditions that compromise the vascular supply to the toes, such as diabetes.

Complications: While matrixectomy is generally safe, complications can occur. These include infection, bleeding, delayed wound healing, and the potential for incomplete matrix removal,

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Received: 02-Dec-2024, Manuscript No: crfa-24-155535; **Editor assigned:** 04-Dec-2024, Pre QC No: crfa-24-155535 (PQ); **Reviewed:** 16-Dec-2024, QC No: crfa-24-155535; **Revised:** 23-Dec-2024, Manuscript No: crfa-24-155535 (R); **Published:** 30-Dec-2024, DOI: 10.4172/2329-910X.1000608

Citation: Eliza L (2024) The Role of Matrixectomy in Managing Persistent Ingrown Toenails and Nail Deformities. Clin Res Foot Ankle, 12: 608.

which can result in nail regrowth. In rare cases, patients may experience pain or sensitivity in the affected toe. To minimize these risks, proper patient selection, adherence to sterile techniques, and post-operative care are essential.

Post-operative care: Post-operative care is crucial to achieving optimal outcomes. Patients are typically instructed to keep the affected foot elevated, apply antimicrobial ointments, and avoid tight footwear. The wound should be kept clean and dry, and patients are generally advised to avoid strenuous activity for several weeks following the procedure [10]. Regular follow-up appointments are necessary to monitor for signs of infection or recurrence.

Conclusion

Matrixectomy is an effective and well-established procedure for the management of persistent ingrown toenails and nail deformities, particularly in patients who have not responded to conservative treatments. Both surgical and chemical techniques offer high success rates in preventing recurrence, with minimal risk of complications when performed properly. Patient selection plays a key role in determining the procedure's success, and thorough post-operative care is essential to avoid complications and ensure optimal healing. Matrixectomy continues to be a cornerstone in the treatment of chronic nail disorders, providing lasting relief and improving the quality of life for affected individuals. Future research should focus on optimizing techniques, reducing complications, and expanding the indications for matrixectomy in patients with various nail abnormalities.

Acknowledgement

None

Interest of Conflict

None

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