JIFAF The Journal of the International Foot & Ankle Foundation
internationalfootankle.org/journal

The Zadik labiomatrixectomy

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The Zadik labiomatrixectomy is a permanent solution for chronic nail pathology in the medically compromised patient. A 63-year-old male builder was referred for the surgical correction of his chronically symptomatic onychauxis hallucal toenail that had been resistant to conservative care. A Zadik labiomatrixectomy procedure was performed under local anesthetic to physically remove the nail germinal matrix in toto. The Zadik labiomatrixectomy provides a safe and effective solution to chronic nail pathology in the medically compromised patient.

Keywords: ingrown toenail, nail surgery, onychocryptosis, Zadik procedure, toenail

There is an unconscious predilection amongst podiatric medical practitioners to perform chemical total nail ablations with phenolic acid when treating pathological toenails. Whilst normally safe and effective, it is not indicated in the comorbid patient due to the long duration of healing resulting from the chemical burn. The Zadik labiomatrixectomy provides a safe and clean procedure to physically remove the germinal matrix in toto whilst relying on primary intention healing by way of incisions and sutures. This theoretically reduces recovery time and infection risk. The Zadik labiomatrixectomy should be considered as an alternative to chemical ablation in the medically at-risk patient.

Case Report

A 63-year old male builder was referred to our clinic for the surgical correction of his chronically onychauxic and symptomatic right hallucal toenail plate that had been present for over 40 years since he injured this toe whilst working on a building site in his younger years. He was a current smoker and took olmesartan with amlodipine 40mg/5mg 1 tablet daily for his hypertension. He did not report any allergies or sensitivities.

On examination, his right hallucal toenail plate was severely onychauxic (Figure 1) and was uncomfortable whilst wearing closed fitting shoes, including his steel-cap work boots where, after long days, this toenail would rub and become sore.

Figure 1 The right hallux showing the dysmorphic onychauxic nail plate.

He would experience recurrent episodes of onychocryptosis along the tibial and fibular borders of this nail plate that necessitated regular podiatry treatments. Discomfort was elicited with compression of the thickened nail plate.

Figure 2 The incisions were drawn onto the hallux pre-operatively.

After informed consent was obtained, the patient was positioned supine in the operative chair. A right hallucal local anesthetic block was administered using a combination of 2 mL of 0.5% bupivacaine hydrochloride / 2 mL 2% lignocaine hydrochloride and 1 mL (4mg) dexamethasone sodium phosphate. After anesthesia was achieved, the right foot was surgically prepped and draped in the typical fashion to facilitate a sterile field.

Procedure

A green tourniquet ring was applied to achieve hemostasis. Eight separate incisions were marked on the toe with a sterile surgical pen: two elliptical incisions overlying the medial and lateral unguilabial folds, one incision overlying the eponychium, and two epidermal incisions extending diagonally from each proximal nail corner (Figure 2). The right hallucal toenail was avulsed using a small periosteal elevator and a large pair of Crile forceps. The nail bed and sulci were cleared of debris using a small dermal curette.

Figure 3 The nail plate was avulsed with a periosteal elevator (a). The nail matrix was resected with a scalpel blade (b). The resected germinal nail matrix (c). 4-0 nylon sutures were employed to achieve closure (d).

Each incision was carefully performed and the eponychium reflected proximally to expose the germinal matrix. The germinal matrix was removed in toto in a continuous 'U' shape. Plastic remodeling of the periungual tissues was performed to restore normal anatomical contours to the right great toe. Closure was achieved with 4-0 nylon sutures in simple-interrupted and modified horizontal mattress techniques (Figure 3).

The patient was discharged when stable and allowed to ambulate with care within a postoperative sandal. He was prescribed paracetamol/codeine phosphate 500mg/30mg, 2 tablets every 6 hours as required for pain and cephalexin monohydrate 500 mg, 2 capsules three times per day for anti-microbial protection.

Postoperative

The patient experienced an uneventful recovery without infection nor nail spicule regrowth. He had some pain that was controlled with his prescribed narcotic for approximately 24 hours following metabolism of his local anesthetic, and then remained on paracetamol 500mg 2 tablets as required for the next 72 hours. After this, he did not require pharmacological pain relief. His sutures were removed at the 10th day postoperatively and he was able to shower after suture removal. He elected to place a band-aid over his toe for the next month whilst wearing his steel-cap work boots to prevent rubbing. Following this he did not require any padding or care and could work without incident.

Discussion

The Zadik labiomatrixectomy was first described in 1950 by F.R. Zadik who had become frustrated with the poor outcomes of the various toenail surgeries available at the time. Zadik described episodes of nail recurrence coupled with poor cosmetic results, which he termed the 'two funny little dumplings'. The purpose of his original technique was to provide the permanent removal of the nail plate without iatrogenic deformity and poor cosmesis (1,2).

There are a plethora of techniques used in the treatment of ingrown and deformed toenails. Some of which can result in poor cosmetic results, slow healing rates, recurrence of the deformity and spicule formation. Some authors believe these adverse events are due to operator error rather than procedural weakness (1). The Zadik labiomatrixectomy has been shown to be safe and effective, however its superiority to chemical ablation has not been demonstrated in the literature (1,3,4).

A distinct benefit to an incisional technique such as the Zadik labiomatrixectomy is its quick healing time, which averages 2.2 weeks (4). This theoretically will reduce the potential infection risk due to the reduced period of wound exposure when compared to other techniques. This benefit is well documented, especially in 'high-risk' populations (5).

The advantages of the Zadik labiomatrixectomy are not limited to its decreased infection risk. The decreased healing time period reduces patient immobilization and allows a return to activities and normal footwear faster when compared to chemical ablation which, in theory, should reduce the patients risk of development of venous thromboembolism (VTE) (6). Nail ablative procedures involve an approximate six-week healing time period which restricts the patient's daily mobility (1).

There is debate as to whether incisional techniques are superior to chemical ablation in the diabetic population. Kontos and colleagues (1) reported a case of a 79-year-old female type II diabetic with a hemoglobin A1c (HaA1c) of 74 mmol/L with an infected onychocryptotic nail that had tested positive for staphylococcus aureus. The patient also suffered from chronic obstructive pulmonary disease (COPD), venous insufficiency, ischaemic heart disease and she had experienced multiple thrombolic events (both below and above knee) and one pulmonary embolus. Given the patient's medical profile the authors triaged the patient for a Zadik labiomatrixectomy over a chemical ablative technique in order to reduce the patient's infection exposure time and postoperative wound healing time. The authors followed this patient for 6 months and tracked her recovery on validated scales (7,8). The patient experienced an uneventful recovery without postoperative infection or dehiscence.

The Zadik labiomatrixectomy shows promise in the treatment of onychocryptosis and nail deformity in the at-risk population, with theoretical reductions in infection and DVT risk. Its superiority to chemical ablation has not been exclusively demonstrated.

Funding declaration

Not applicable

Conflict of interest declaration

The authors declare no conflicts of interest

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