A New Onychocryptosis Classification and Treatment Plan

Alfonso Martínez-Nova, Lic Pod*
Raquel Sánchez-Rodríguez, Lic Pod*
David Alonso-Peña, MD*

Onychocryptosis is a pathologic condition of the nail apparatus in which the toenail damages the nail fold. It is a common condition provoking pain, inflammation, and functional limitation. It principally occurs in the hallux. Onychocryptosis is one of the most frequent complaints regarding the foot and accounts for many clinical consultations. The disorder has been classified in terms of the stages of the pathologic condition. In our practice, we discovered a clinical entity that was not previously classified in the literature. We classify onychocryptosis into stages I, IIa, IIb, III, and the new stage IV. A treatment plan is offered for each stage of this classification, with both general and specific indications given. In onychocryptosis treatment, it is important to select the surgical technique best suited to the patient’s particular clinical situation. (J Am Podiatr Med Assoc 97(5): 389-393, 2007)

*Podiatry, Department of Nursing, University of Extremadura, Cáceres, Spain.

This article is a summary of the main part of Martínez-Nova A: Podología: Atlas de Cirugía Ungueal, Editorial Médica Panamericana, Madrid, 2006, and is adapted with permission of the publisher.

Corresponding author: Alfonso Martinez-Nova, DPM, Centro Universitario de Plasencia, Avda. Virgen del Puerto n° 2, 10600 Plasencia, Cáceres, Spain.

• **Stage I (inflammatory stage).** This stage is characterized by the presence of erythema, slight edema, and pain when pressure is applied to the lateral nail fold. The nail fold does not exceed the limits of the plate (Fig. 1).

• **Stage II (abscess stage).** This stage is divided into two substages. In stage IIa the pain increases and there is edema, erythema, and hyperesthesia. There may be serum drainage and infection. The nail fold exceeds the nail plate and measures less than 3 mm (Fig. 2). Stage IIb has symptoms similar to stage IIa. The hypertrophic fold exceeds the plate and measures more than 3 mm (Fig. 3).

• **Stage III.** In stage III, the symptoms worsen, with granulation tissue and chronic hypertrophy of the nail fold. The granulomatous or hypertrophic tissue largely covers the nail plate (Fig. 4). If onychocryptosis is not properly treated, it may progress even further, resulting in serious chronic deformation of the toenail, nail folds, and distal fold.

We define a stage IV, which completes Mozena’s classification. Stage IV results from evolution of stage III, with serious chronic deformity of the toenail, both nail folds, and the distal fold (Fig. 5). The difference between stages III and IV is the distal hypertrophy.

**Indications for Nail Surgery**

Nail surgery is indicated when the patient has pain and functional disability; in cases of recurrent onychocryptosis, surgical relapse, or iatrogenic nail dis-
orders; and when conservative treatments have failed. The surgery should have several aims, with the overall objective of restoring the integrity of the nail apparatus. The surgical procedure should correct the structural deformities of the nail, restore the longitudinal trajectory of the nail plate, reestablish the morphological and normal physiologic features of the nail folds, prevent painful processes and infections, and conserve the biomechanical function of the nail plate. The ultimate aim is to completely recover the functionality of the nail apparatus.

Discussion

In the medical, dermatologic, and podiatric medical literature, various surgical techniques have been described to treat onychocryptosis. The ideal surgical procedure should result in a high level of patient satisfaction (both functional and aesthetic), a rapid return to normal activities, and a low rate of recurrence. Although an attempt has been made to establish a “standard technique” that will resolve onychocryptosis in most cases, there is no scientific evidence that any single technique is the procedure of choice in all cases.
Despite this lack of scientific evidence for the superiority of any one technique, many studies have shown greater success with the phenol-alcohol technique compared with other techniques. These studies show high rates of efficacy (80% to 95%) and low recurrence rates (approximately 2% to 5%). On the negative side is a 2- to 5-week recovery time, with the inconvenience that this represents for the patient. Moreover, chemical matrixectomy may destroy too much or too little tissue because it is not a precise technique. Many other variables can influence the effectiveness of chemical matrixectomy, including tissue hydration; bleeding, which can cause dilution of the application; and the shelf life of the chemical used, which can affect its concentration. Nonetheless, the phenol-alcohol technique is clearly the most extensively studied and practiced technique. It is simple to perform, requires no complex instruments, has a broad range of indications, and is widely endorsed in the dermatologic and podiatric medical literature.

The phenol-alcohol technique can be performed in the presence of concomitant infection, and Giacalone demonstrated that it can be applied to diabetic patients, for whom it presents no differences in healing time or postsurgical complications. The use of sodium hydroxide, less prevalent in the podiatric medical community, has the same advantages as phenol, but with considerably less tissue destruction. Other studies, however, have found no significant differences between mechanical resection of the matrix and phenolization of the matrix. This last study recommends resection of the matrix to avoid the use of a toxic substance such as phenol. Persichetti et al affirm that simple excision of the matrix using mechanical procedures (with a curet or scalpel) is most effective, leading to fewer complications and infections and with a shorter healing time.

The use of physical methods to perform the matrixectomy, such as carbon dioxide laser dissection or electrodissection, have also been discussed. Although they are important and effective surgical methods, they are relatively expensive.

Most of the reports we found in the medical literature were retrospective studies; only two were prospective. They consisted of randomized controlled clinical trials comparing two techniques (phenol versus mechanical resection of the matrix with curet or scalpel). One of these two studies suggests using the phenol technique, and the other recommends mechanical resection of the nail matrix. The findings differ because the aesthetic and functional results depend not only on the technique used but also on the skill of the professional, the recovery protocol, the appropriate selection of the patient, and other factors. The podiatric medical community must undertake scientific studies and controlled clinical trials to obtain demonstrable scientific parameters as part of evidence-based podiatric medical research. It is important to offer a surgical solution for each stage of onychocryptosis, selecting the appropriate technique for the patient’s particular clinical situation.

Treatment Algorithm According to the Stage of Onychocryptosis

The surgical techniques used are classified into four groups according to the stage of onychocryptosis (Fig. 6).

Excision of the Spicule and Partial Matrixectomy: Suppan I Technique

**General Indication.** Onychocryptosis affecting the nail plate without hypertrophy of the nail fold. The technique consists of excision of the affected portion of the toenail and partial mechanical matrixectomy (with curet or scalpel).

**Indications According to Stage**

- **Stage I**
- Adult or elderly patients, in whom tissue-regeneration capacity is reduced and likelihood of recurrence is lower.
- Patients with insulin-dependent diabetes. In patients with some vascular risk or poor control of their diabetes, after previous stabilization of the vascular situation and glycemia, this technique is preferred to phenol-alcohol to avoid complications caused by the burn.

Chemical Partial Matrixectomy: Phenol-Alcohol Technique

**General Indication.** Onychocryptosis affecting the nail plate with hypertrophy of the nail fold of less than 3 mm. In these cases, excision of the portion of the toenail and phenol partial matrixectomy are performed.

**Indications According to Stage**

- **Stage I**
- **Stage IIa**
- Young or adolescent patients because they have great tissue-regeneration capacity. The phenolization ensures a low recurrence rate.
- Patients with controlled type 1 or 2 diabetes. The phenol-alcohol technique is safe in diabetic patients who have no vascular risk and good control of their diabetes.
Wedge Resection of the Toenail and Nail Fold

Aesthetic Reconstruction Technique. General Indication. Onychocryptosis affecting the nail plate with hypertrophy of the nail fold exceeding 3 mm. These cases involve excision of the affected portion of the nail plate, partial matrixectomy, and wedge extirpation of the hypertrophic nail fold and the nail bed. The hypertrophic fold is cleared from the matrix zone, below the eponychium to the distal end of the toenail (Fig. 7). No cutaneous incision is made, and therefore no stitches are required.23, 24

Indication According to Stage
• Stage IIb

Winograd Technique. General Indication. Onychocryptosis affecting the nail plate with hypertrophy of the nail fold greater than 3 mm. These cases involve excision of the affected portion of the nail plate, partial matrixectomy, and extirpation of the hypertrophic tissue.25, 26

Indication According to Stage
• Stage III

Figure 6. Stage and treatment algorithm. DM indicates diabetes mellitus.

Figure 7. Wedge resection of the lateral fold using the aesthetic reconstruction technique. (Reprinted with permission from Martínez-Nova.1)
Total Matrixectomy

General Indication. Onychocryptosis with dystrophy of the nail folds and distal folds. Nail dystrophy. Nail excision and total matrixectomy with phenol is performed.25–30

Indication According to Stage

- Onychocryptosis in stage IV adult patients
- Onychogryphosis, onychodystrophy
- Chronic hypertrophy of the distal and lateral folds

In this stage of our classification (stage IV), the lateral and distal folds are considerably hypertrophied, and the nail is affected. There are two treatment options. The first option is three Winograd procedures for tibial/fibular/distal hypertrophy. This procedure is indicated in young patients to conserve the integrity and function of the nail apparatus. The second option is phenol total matrixectomy, which must be performed in adult patients. If other disorders are present, such as onychomycosis or onychodystrophy, phenol total matrixectomy might be the better option. If the nail fold is widely affected, the Kaplan31 technique should be considered.

Conclusion

Correct management of onychocryptosis requires identification of the stage and evaluation of the affected tissues. Nail surgery should be considered in cases of pain, recurrent onychocryptosis, surgical relapse, and failure of conservative treatment. It is important to select the surgical technique that is best suited to the patient’s particular clinical situation.

Financial Disclosures: None reported.
Conflict of Interest: None reported.

References