Correction of pincer nail deformity with dermal flap: a new technique in pincer nail deformity surgery

Serdar ALTUN1, Murat GÜRGER2, Enver ARPACI3, Emre İNÖZÜ4

1Fırat University Faculty of Medicine, Department of Plastic and Reconstructive Surgery, Elazığ, Turkey
2Fırat University Faculty of Medicine, Department of Orthopedics and Traumatology, Elazığ, Turkey
3Konya Training and Research Hospital, Department of Plastic and Reconstructive Surgery, Konya, Turkey
4Dışkapı Yıldırım Beyazıt Training and Research Hospital, Department of Plastic and Reconstructive Surgery, Ankara, Turkey

Pincer nail deformity is the extreme, transverse, proximal-to-distal overcurvature of the finger, caused by osteophyte of the distal phalanx, and causing clamp effect on soft tissues and nail ingrowth. We report a new technique consisting of removal of the osteophyte causing clamp effect. Depressed areas of both sides of the nail bed (lateral nail fold) were corrected with dermal flaps prepared from the side. Depressed areas were filled by these flaps, creating a smooth surface for the nail bed, and adequate correction was obtained.

Keywords: Dermal flap; pincer nail.

Pincer nail deformity (PND) is a nail disorder of the hands and feet characterized by an excessive transverse overcurvature of the nail,[1] which is caused by osteophyte formation in the distal phalanx. Increased overcurvature starts in the proximal part of the nail, progressively proceeds to the distal part, and shows a pincer effect in the soft tissues located at the tip of the toe (Figure 1).[2] Patients have pain on walking, restrictions for choosing shoes, cosmetic problems, and other obstacles in their daily life.[3] Although the etiology of PND is unknown, the most frequently reported factor is unfitting shoes.[4] PND affects 0.9% of the population and may be seen in all nails, though it most frequently affects the big toe.[5] Although a number of methods have been used in the treatment of PND, there are no widely accepted treatment modalities.[3] Therefore, in this study, we present a new method of treatment we used in a patient with PND.

Methods

Digital block was performed after cleansing the surgical field with povidone-iodine. A tourniquet made from the finger of a glove was applied to obtain a bloodless surgical field. Surgical steps are shown in accompanying figures and photos.

The first step consisted of elevation of the nail. The deformed nail was dissected gently with an elevator and then elevated. Injury to the nail bed was avoided.

In the second step, the incision was planned in the shape of a shirt collar, starting 2 mm from the nail margin and extending to the nail apex. A triangle-shaped skin island was marked for excision (Figure 2a).
The third step consisted of elevation of the flap and osteophyte. After the nail bed was cut along the previously determined incision line, it was elevated subperiosteally starting from the tip of the toe and advancing to the proximal part (Figure 2b). The exposed osteophyte on the floor was rasped using a bone rasp, and the proximal and distal parts of the nail matrix were brought to the same level.

The fourth step was enlargement of the nail bed and preparation of dermal flaps. The site for the elevated nail bed becomes narrower distally (Figure 3a). In order to achieve a better cosmetic result, distance A in the proximal part must be equal to distance B in the distal part. For this, 2 parallel lines were drawn distally from the points indicated as 1 and 2 on line A (Figure 3b). Two triangles lateral to the nail were deepithelialized and elevated, their bases being in the distal part. These elevated flaps were sutured to depressed grooves between the distal phalanx and lateral fold of nail (Figures 2c–f).

The nail bed was sutured in the fifth step. The distal nail bed widened by the collar-shaped incision was sutured after excising the triangle-shaped skin in the pulp of the finger, and both sides of the nail bed were sutured separately to the incision at the lateral borders, covering the deepithelialized dermal flaps.

Case report
A 67-year-old female applied to our clinic with complaint of ingrown toenail in 2012. On physical examination, PND was determined on the patient’s right big toe. Her history did not reveal any specific etiologic factors except wearing unfitting shoes, but she had twice extracted the nail due to incorrect diagnosis, separated by a 1-year interval. The patient was operated under local anesthesia with the technique described above. The patient did not have any wound problems, and there was no re-
current nail pinching 14 months after surgery (Figure 4). However, tinea unguium persisted in the postoperative period due to her failure to adhere to the prescribed drug regimen (terbinafine).

Discussion
The term “incurved nail” was first used by Frost in 1950 and was subsequently modified to “pincer nail” by Cornelius and Shelley in 1968.[6] The etiology of the disease is not clearly known, but some inherited and acquired factors have been identified.[4] The most frequently reported acquired factor is use of unfitting shoes; however, psoriasis, developmental abnormalities, trauma, use of beta blockers, epidermal cysts, subungual exostosis, and osteoarthritis have also been reported.[7]

The aim of PND treatment is to correct the curve that pinches the finger tip and obtain a cosmetically normal nail.[6] A number of conservative methods and various surgical procedures have been described for treatment of PND. Most conservative methods include destruction of the nail matrix with physical or chemical agents—including uric acid, thioglycolic acid,[2] phenol,[8] CO₂ laser,[9] and electrocoagulation[10]—which may produce unsatisfactory cosmetic results.

A number of surgical methods have been reported in the literature. Dermal graft reconstruction was described by Brown[11] in 2000 and by Nam[2] in 2011. In this technique, 2 depressed areas on both sides of the nail 1 on each side? were reconstructed with dermal grafts obtained from the inguinal or hypothenar regions. Disadvantages of this technique include additional donor site morbidity and long operation time. In addition, it does not correct distal nail narrowing. Similarly, Mit-suo reported use of mucosa graft obtained from hard palate instead of dermal matrix in 2003.[12] In 2005, Zook[7] used AlloDerm (acellular dermal matrix, Life-
Instead of dermal graft and reported similar results. The advantage of this technique is its ease of use; however, it is expensive. Mutaf et al. obtained a smooth surface by osteophyte resection and used the 5-flap Z-plasty technique described by Mustarde to widen the distal part of the nail.[13] While this easy-to-use technique produces successful results, it presents the disadvantage of causing significant scarring in the pulp of the nail.

In the technique we described, the nail bed was elevated to leave a thin hyponychial tissue on both sides of the nail. This incision allows intervention to the nail bed to achieve the desired shape and ensures protection of the tissues on the lateral side of the nail, which are relatively thicker than the hyponychial tissue. This tissue must be excised to make a nail which has the same dimensions in its proximal and distal parts. However, we protect this tissue and transform it into deepithelized flaps, with their bases located distally. Even if a relatively smoother nail bed is obtained after removal of the osteophyte at the center of the nail, depressed regions remain between the distal phalanx and lateral borders. The dermal graft construction technique of Brown[11] and Nam[2] influenced us to reconstruct these areas with dermal flaps. We believe that use of planned dermal grafts together with rasping the osteophyte results in a cosmetically better nail and avoids additional donor site morbidity, which we consider to be the advantages of our technique. Additionally, there is a lesser probability for scar formation, since the incision does not reach the pulp of the finger.

Although its description may appear complex, our technique is easy to perform. However, further studies on larger patient cohorts are needed to clearly define the feasibility of our technique and reach conclusive results.

Conflicts of Interest: No conflicts declared.

References