



Retronychia

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Authors' contributions

This work was carried out in collaboration between all authors. Authors ES and FU designed the review collected the clinical figures and wrote the first draft of the manuscript. Author XW contributed with the ultrasound figures and with the redaction and references of that subject. All authors read and approved the final manuscript.

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ABSTRACT

Background: Retronychia is an inflammatory process of the proximal nailfold produced by the backward ingrowth of the nail plate.

Etiology: It appears secondary to proximal nail plate rupture induced principally by wearing tight shoes, or related to a traumatic origin such as sports or dance.

Clinical Findings: In the acute form the proximal nail fold appears painful, with signs of inflammation, whereas in the chronic state, besides the inflammation, the nail plate appears yellowish and thickened. It affects predominantly the great toe, sometimes bilaterally, and also occasionally the fingers. Sometimes it is accompanied by the formation of granulation tissue near the proximal nail fold.

Treatment: Nail avulsion is the treatment of choice and it is curative.

Comments: Retronychia may be an underdiagnosed disease, with only a few reports found in the english, french, spanish and asian literature. A review on this subject is presented, illustrated with clinical and ultrasound figures.

Keywords: *Nail; retronychia; ingrown nail; onychocryptosis; onychomadesis; granulation tissue.*

1. INTRODUCTION

In daily practice onychocryptosis is a frequent motive of consultation. It is produced by penetration of spicules of nail in one or both lateral nail folds towards distal, sometimes associated with the formation of periungual granulation tissue. Many times it is caused by the incorrect rounded cutting of the nail. Its most frequent location is in the great toes.

The involvement of the proximal nail fold has rarely been described, being the first three cases reported by de Berker et al in 1999 [1].

We present and illustrate a review of retronychia, in which the nail is embedded backwards into the proximal nailfold.

2. ETIOLOGY

Traumatism appears among the most frequently described causes, such as an acute trauma that affects the area of the proximal nail fold, altering the normal growth of the nail, and affecting mainly the toes, especially the big ones [1]. The use of tight footwear is the main cause, occurring mostly in women. This origin has been described in isolated cases [2], as well as in some series, with a clear predominance in female sex: 6/6 with ages between 14 and 33 years [3] 16/19 (among 14 and 71 years) [4] 19/20 (between 13-55 years) [5] and 15/18 (between 12 and 83 years) [6]. It has also been described in athletes (jogging, walking) [7], appearing as a background in half of the cases of this series, in which 45% of them presented claw toes, from 2nd to 5th toe, with compensatory hyperextension of the big toes.

Although most cases have occurred in adults, a series of 15 cases has been described in children, adolescents and young adults between the ages of 13 and 24 [8]. It has also been described after the use of steel toe boots [9] and in a woman who practiced martial arts (Taekwon-Do), with the appearance of the process after wearing tight shoes [10]. In another series of 18 cases, the authors suggested another possible etiology, in addition to those already described, such as pregnancy and puerperium in which a relative ischemia of the nail matrix could be produced, favoring the formation of retroniquia [6]. This would be supported by the presence of Beau's lines in other nails of the lower

extremities of these patients, which would be a manifestation of relative ischemia. Beau's lines have also been observed by hand surgeons after the use of tourniquets, which would favor the ischemic origin of these [11]. Retronychia could be a more intense manifestation of ischemia, starting from Beau's lines as the most slight affectation, continuing with the onychomadesis as an intermediate form and being the retronychia its most extreme manifestation, with a total separation of the nail.

Unlike retronychia, Beau's lines and onychomadesis, despite being produced by arrest of the growth of the nail plate, they are usually caused by medical causes, such as infections, severe autoimmune or systemic diseases, secondary to medications, high fever, nutritional deficiencies, etc. [11,12,13] and most of the nails are affected; on the other hand, in retronychia, the most frequent cause would be traumatic, either acute or chronic, in the form of repetitive microtrauma or major trauma. In these cases, inflammatory, granulation tissue could be produced, which would help the loss of connection between the nail plate and the matrix, that could be favored by the fragmentation in various degrees of the nail plate. This segmentation (onychomadesis) of the lamina could partially or totally affect its thickness, and prevent the advance of the nail forward. If the longitudinal alignment of this detached nail is maintained, the proximal fragment of the new nail will push the distal segment corresponding to the old nail, increasing local inflammation and giving the clinical appearance of onychomadesis. But, if there is no alignment or the advancement of the old nail is hindered by the use of tight shoes or sports activities -such as mountaineering – [14] or dance, the underlying new nail will push up the old nail, determining inflammation of the proximal nail fold [15]. When the nail is loosened, a rolling of the lamina occurs, favoring its detachment at the level of the proximal zone of the matrix; this causes the nail to be embedded backwards. Usually patients report that this nail does not grow or grows very slowly. The origin of retronychia is merely traumatic and is not related to the intake of medications, such as retinoids or cyclosporine, which may be associated with the formation of periungual granulation tissue [16,17]. However, a case of retronychia in a renal transplant recipient has been described, in whom the long-term use of immunosuppressive drugs may have induced a cumulative toxic effect on

the nail matrix; or perhaps it was merely a coincidence matter [18].

3. CLINICAL FINDINGS

Chronic inflammatory signs occur, with edema, erythema and pain in the area of the proximal nail fold (proximal paronychia, rarely with purulent discharge) (Fig. 1). Most often it affects the first toe [4,5] and occasionally the thumb or index. Nail growth is detained, and the nail plate appears thickened and

with changes in its coloration, with a yellowish tone (Fig. 2), especially in chronic cases (due to thickening of the nail plate, laminar formations, pronounced onycholysis [19] and formation of inflammatory exudate that accumulates under the nail) . Its base is higher than the distal edge [1]. The formation of granulation tissue is common in about one third of cases [4] at the junction of the proximal fold with the lateral ones, which is not usual in classic onychocriptosis, in which it is distal and lateral.



Fig. 1. Proximal nail fold with erythema in a case of short evolution



Fig. 2. Yellowish and thickened nails in a long-standing case of retronychia. Lateral and proximal nail folds show irregular and inflamed contours

In a review of 19 cases [4] 84% affected the great toe; in 16% it was bilateral and in another 16% affected a finger, especially the thumb (Fig. 3). In another series of 18 cases, the most frequent clinical findings were xanthonychia (94%), increase of the longitudinal curvature of the nail (61%), elevation of the nail plate towards proximal (55%), (Fig. 4) inflammation of the nail fold (50%) and granulation tissue formation (50%), thickening of the nail (44%), superficial leukonychia (33%), subungual hemorrhage

(22%), and Beau's lines (11%). In one case, the affection of the index, middle and ring fingers after an automobile accident was described [20]. In another series, the first toe was affected in all cases, and bilaterally in 6/20 (30%), with an evolution time of 5 months on average [5]. In a series of 21 cases of acquired great toenail dystrophy, 2 cases presented retronychia, showing onychomadesis, onycholysis, loss of cuticle and yellowish chromonychia [21].



Fig. 3. Retronychia with inflammation of the proximal nail fold, onychomadesis and formation of proximal granulation tissue

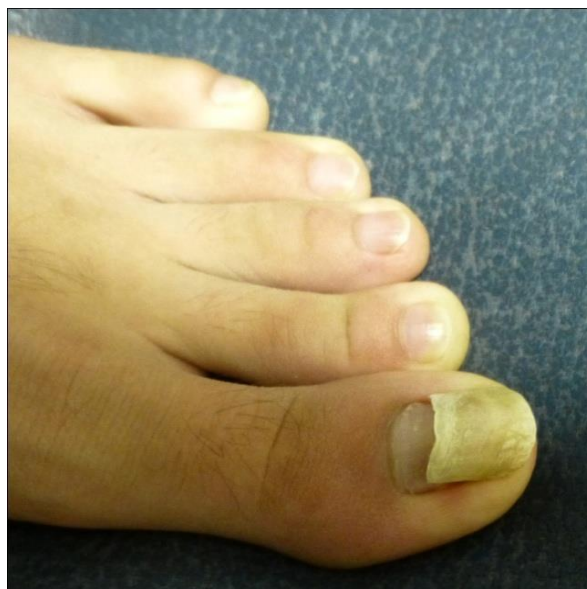


Fig. 4. Detachment of the nail plate towards proximal in a case of rethonychia not treated

4. STUDIES

Color doppler ecomotography of the nail helps to make the diagnosis, since it allows to detect and measure the degree of posterior displacement of the nail plate, as well as determining the magnitude of the associated subungual and periungual inflammatory signs. Additionally, it can detect the presence and extension of the onychomadesis or fragmentation of the nail plate with which it is frequently associated, as well as

supporting the differential diagnosis with tumors, other ungueal inflammatory processes or arthropathies [22]. Some echographic signs of retronychia are the shortening of the distance between the origin of the nail plate and the base of the distal phalanx -in comparison with the contralateral side-, the presence of a hypoechoic halo surrounding the origin of the nail plate, and the thickening of the proximal periungueal dermal plane [14,23] (Figs. 5 and 6).

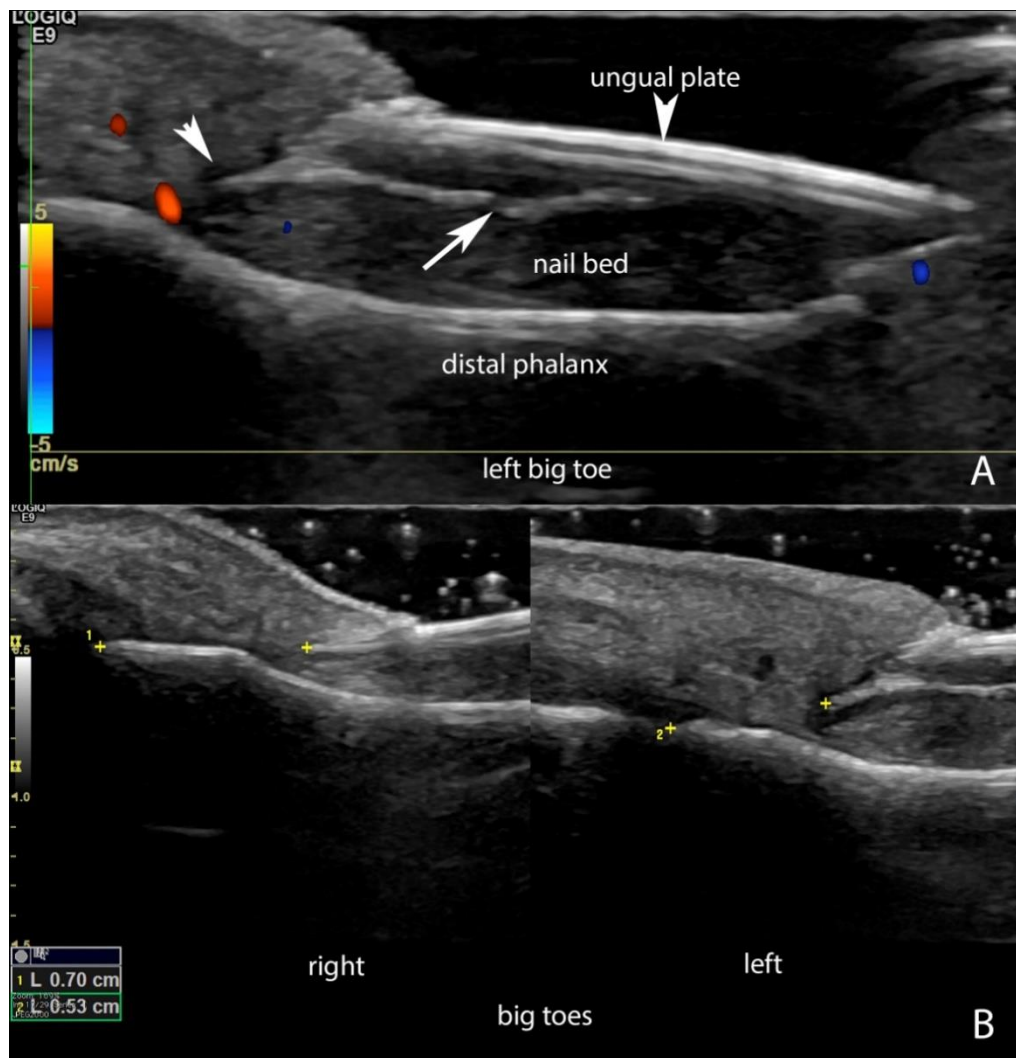


Fig. 5(A,B). Color Doppler ultrasound of retronychia and partial onychomadesis of the ventral plate at the left big toe (A, longitudinal view left big toe; B, side-by-side comparison of the big toes; longitudinal views). A. Diffuse thickening and decreased echogenicity of the ungueal bed that involves the matrix region with hypoechoic halo surrounding the origin of the nail plate (oblique arrowhead pointing down). Notice the fragmentation of the ventral plate (long arrow pointing up) and the prominent periungueal vessels (in colors). B. Decreased distance between the origin of the nail plate and the base of the distal phalanx at the left big toe (5.3 mm left versus 7.0 mm right). Notice the thickening of the dermal layer of the proximal nail fold at the left side

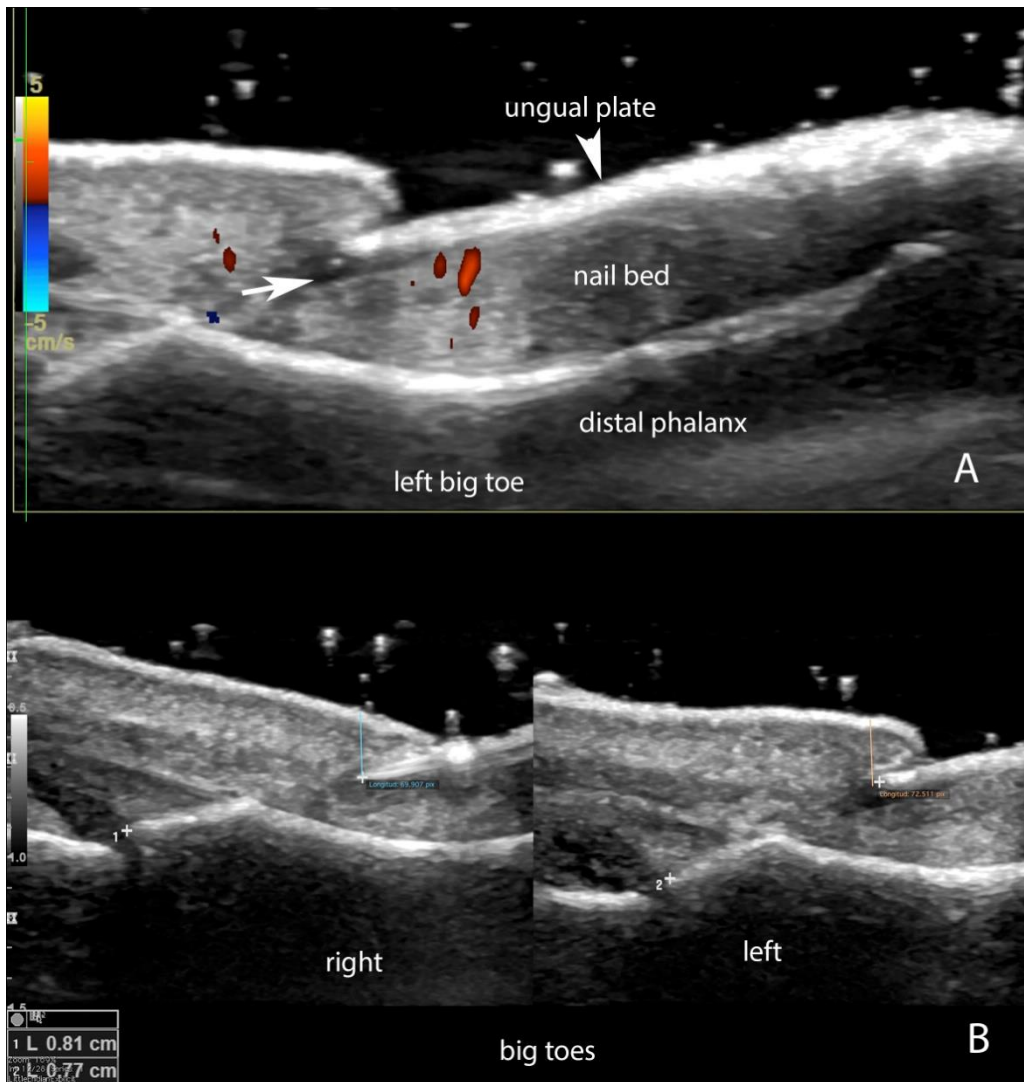


Fig. 6(A, B). Color Doppler ultrasound of retronychia without onychomadesis at the left big toe. (A, longitudinal view; left big toe; B, side-by-side comparison of the big toes; longitudinal views). A. Thickening and slight increase of the vascularity at the proximal part of the nail bed and nail fold. Thickening of the nail plate with loss of the bilaminar pattern. Notice the hypoechoic tissue surrounding the origin of the unguis plate (arrow pointing right). B. Decreased distance between the origin of the nail plate and the base of the distal phalanx at the left big toe (7.7 mm left versus 8.1 mm right)

5. DIFFERENTIAL DIAGNOSIS

Differential diagnosis should be done with chronic paronychia, psoriatic arthritis, and diverse subungual cysts and tumors, including glomus tumor, mixoid cyst, enchondroma, and squamous cell carcinoma [24,25].

6. TREATMENT

Retronychia does not usually improve with treatments based on topical or systemic antibiotics [26,27,28,29,30,31,32], and

spontaneous improvement has been reported in some cases [33]. Complete avulsion of the nail – and another subjacent nail plates-[34] shows good results, representing a diagnostic and therapeutic approach [35]. The procedure relieves chronic pain and eliminates inflammatory signs, allowing a complete recovery, without recurrence or dystrophy [36]. Nevertheless, nail avulsion in a series of 15 patients subsequently resulted in nail dystrophy in one third of the cases [8]. Proximal nail avulsion is a conservative treatment which may be employed when retronychia is diagnosed on an early stage,

keeping the distal portion of the nail plate [37]. Avulsed nail plate helps in establishing the diagnosis, showing proximal thickening with two or more successive, superimposed nail layers [24,28]. Histopathological study of the avulsed nail shows marked hyperkeratosis with focal undulation [38].

As preventive measures, wearing of tight shoes should be avoided, especially sharp-pointed ones.

In some cases, a conservative treatment has been indicated, consisting in the fixation of the proximal area of the nail with an adhesive tape, which compressed downwards the ungueal plate that was loose; it was effective in 2/5 of the cases in which this method was used [5].

Clobetasol propionate has been used topically with transient relief [11]. In another isolated case, the application of a cream containing betamethasone with gentamicin -associated with the use of comfortable shoes- was beneficial [39].

7. CONCLUSION

Retronychia has been recently described as a new form of onychocryptosis that affects the proximal nail fold, resulting from trauma or wearing tight shoes.

We must keep it in mind in the presence of a persistent, noninfectious inflammation of the proximal nail fold, with a yellowish and thickened nail that does not grow, and/or by the infrequent formation of granulation tissue towards the proximal portion of the nail fold.

The treatment of choice is surgical avulsion of the nail.

CONSENT AND ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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