

REVIEW ARTICLE

“Retronychia – clinical and pathophysiological aspects”F. Ventura,^{1,*} O. Correia,¹ A.F. Duarte,¹ A.M. Barros,¹ E. Haneke^{1,2}¹Centro de Dermatologia Epidermis, Instituto CUF, Porto, Portugal²Hospital Isla, University of Bern, Switzerland

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Abstract

Retronychia represents proximal ingrowth of the nail that occurs when the nail embeds backwards into the proximal nail fold. It is suspected when there is a persistent paronychia, particularly in the setting of trauma. Important clinical criteria for diagnosis are inflammation of the proximal nail fold, granulation tissue emerging from under the nail fold, thickening of the proximal portion of the nail plate and interruption of nail growth. The condition is rarely diagnosed and often misinterpreted, and is therefore unnecessarily treated with systemic antibiotics and antifungals. Avulsion of the nail confirms the diagnosis and it is the curative treatment. Conservative treatment with an adhesive technique is a valid option in early cases. We report 20 cases of retronychia diagnosed in our department between 2010 and 2013.

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Conflicts of Interest

None.

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None.

Introduction

The term retronychia, coined in 1999 by De Berker and Rendall,¹ represents proximal nail plate ingrowth into the proximal nail fold associated with multiple generations of nail plate aligned one above the other beneath the proximal nail fold resulting in chronic paronychia.

Retronychia might be difficult to diagnosis and the differential diagnosis includes several subungual tumours and cysts.² There are few series in the literature; the largest included 19 cases in 2008.³

Methods

Clinical, histological and iconographic retrospective review of 20 cases of retronychia were diagnosed in our department between 2010 and 2013.

Results

The 20 clinical cases are summarized in the Table 1.

There was a female preponderance (19/20 patients – 95%). The mean age was 28 years (13–55 yrs). All cases occurred in halluces, bilaterally in six of 20 (30%) patients. The mean time of evolution was 5 months. Repeated trauma, particularly sports, was associated with 50% of cases and nine of 20 (45%) subjects had claw toes (2nd–5th) with reflex compensatory hyperextension of the halluces. All patients presented with

inflammation of the proximal nail fold in the setting of disrupted nail growth in the preceding months.

Most patients (14/20 – 70%) had received previous treatments, namely systemic antibiotics and antifungals (9/20 – 45%) without success. Avulsion of the nail was performed in 15 patients (75%). The findings at surgery were the same, with between two and four new nail plates superimposed on each other. In other cases (25%) we opted for conservative treatment, relieving tissue pressure on the nail plates and fixing them with adhesive tape.

Pain and inflammation subsided rapidly after avulsion followed by a normal nail regrowth in 12 patients (Fig. 1). Resolution was also found in two of five patients treated with adhesive tape application (Fig. 2). There was a clinical improvement in five cases – two patients treated surgically and three of the patients treated with adhesive tape application. Only one case recurred 2 years after. (Fig. 3).

Discussion

This review describes the disease termed retronychia that starts with the disruption of the longitudinal growth of the nail due to an acute insult often associated with repeated (micro) trauma.^{2–4} Normally, such an insult leads to complete separation of the old plate from the matrix and nail bed. The newly formed plate grows under the old one and pushes it out. In retronychia, the

Table 1 Description of 20 cases of retronychia

Patient no./sex/age (year)	Localization	Duration (month)	Precipitating event	Previous treatments	Treatment	Outcome
1*/F/26	L H	6	Rhythmic gym	sATB, tAF	Avulsion	Resolution
2/F/36	L+R H	?	RHH	Surgery	Avulsion	Resolution
3/F/33	L+R H	4	RHH	sAF	Taping	Resolution
4/F/13	R H	6	RHH	–	Avulsion	Resolution
5/F/19	R H	7	RHH	Surgery	Avulsion	Resolution
6/F/29	L H	4	Trauma/RHH	sATB, sAF, tAF	Avulsion	Resolution
7/F/29	L H	5	RHH	sATB, sAF, tAF	Avulsion	Resolution
8/M/17	L H	?	Several sports (ski, water polo...)/RHH	tAF	Avulsion	Resolution
9/F/14	L+R H	5	Several sports/RHH/Orthopaedic problem	–	Taping	Improvement
10***/F/33	L H	6	Trauma	–	Avulsion	Relapse (after 2 years)
11/F/20	L+R H	4	–	sATB, sAF	Avulsion	Resolution
12/F/39	L H	4	–	sATB, sAF	Avulsion	Resolution
13/F/30	L H	6	High heels	sATB, sAF	Avulsion	Resolution
14/F/24	L H	6	–	Surgeries	Avulsion	Improvement
15/F/48	L+R H	4	–	–	Taping	Improvement
16/F/55	R H	1	Dance	–	Avulsion	Resolution
17/F/16	L+R H	2	Acrobatic gym	tAF	Taping	Improvement
18/F/43	L H	7	–	sATB	Avulsion	Resolution
19/F/17	L H	2	Tennis/RHH	sATB, sAF	Avulsion	Improvement
20*/F/16	L H	8	Hiking	–	Taping	Resolution

L, left, R, right, H, hallux; RHH, reflex hyperextension of halluces; sATB, systemic antibiotics, sAF, systemic antifungals, tAF, topical antifungals.

?could not be specified by the patient

*Fig. 1a-1f

**Fig. 2a-2d

***Fig. 3a-3h

new nail is partially attached to the old one remaining in the nail pocket because the new nail fails to move distally, but passes beneath it and pushes the old nail upwards.²⁻⁴ As this process may repeat new nail plates will be superimposed on each other, creating a multilayer sandwich of proximal nail beneath the nail fold.²⁻⁴ The oldest, uppermost nail, with its sharp proximal edge, is pushed into the ventral aspect of the proximal nail fold piercing its epidermis causing pain, inflammation and granulation in tissue²⁻⁴ (Fig. 4).

Onycholysis apparently plays a crucial role in the pathogenesis and maintenance of retronychia. All our cases and the ones of another series⁴ exhibited onycholysis involving approximately 90% of the nail bed, which is in sharp contrast to the earlier assumptions. This makes the nail extremely vulnerable and susceptible to back-and-forth movements that cause a horizontal split in the matrix epithelium at the level between the basal compartment and the keratogenous zone. As seen in histopathology slides, there remains some connection between the new and the old nail in the distal matrix region, but a split forms in the proximal three quarters between the newly formed nail at the base and the old one on top (Fig. 4). This onycholysis also allows the nail to recede even though it still continues to grow. Onycholysis is also the reason for the development of a distal nail fold, which

is not seen as long as the old nail plate is in place but can be easily seen after avulsion (Figs 1a-d, 4, 5b-c). This distal nail fold increases after avulsion due to lack of counterpressure from the soft tissue of the toe tip during gait. It is the reason for the thick yellow dystrophic nail described in 30% of the patients in the most recent publication.⁵ Taping to avoid the formation of a distal nail fold is therefore necessary and an integral part of our treatment schedule (Figs 1d, 3d). In this setting of persistent paronychia, the condition is often misinterpreted and this seems to be the explanation for the rarity of cases of retronychia described. In fact, since its first description there are approximately 70 cases cited in the literature.¹⁻¹² Our series reports 20 cases diagnosed in a period of 4 years. This disease has been underdiagnosed so it was inadequately treated with systemic antibiotics and antifungals,⁴ also observed in 70% of patients in our series.

The diagnosis of retronychia is clinical. In most cases, thickening of the proximal portion of the nail plate, inflammation of the proximal nail fold, granulation tissue emerging from under the nail fold^{4,6,7} and interruption of nail growth are observed. In fact, all patients report not having cut the nails for months. The histological examination is not necessary for the diagnosis but it seems essential to exclude any proximal nail fold neoplasia.

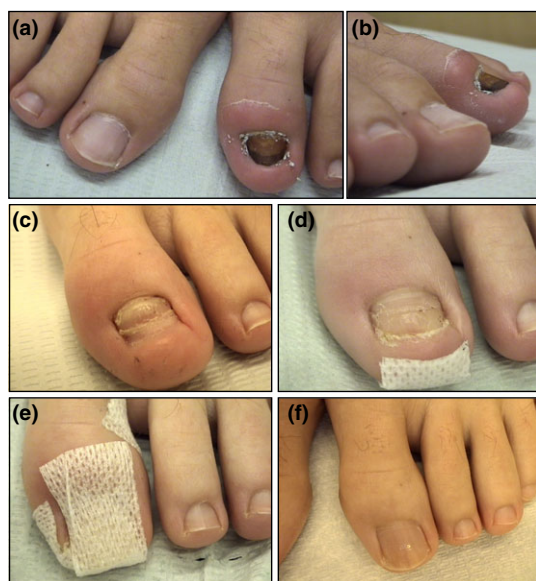


Figure 1 (a) Left great toe is affected by retronychia. (b) Inflamed and thickened proximal nail fold. (c) Four months after the avulsion. (d) and (e) Six months after avulsion; taping to avoid the formation of a distal nail fold is therefore necessary and an integral part of our treatment schedule. (f) Normal nail growth, twelve months after the avulsion.

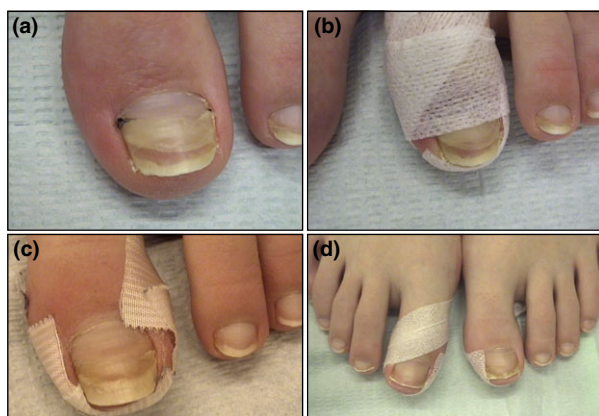


Figure 2 (a) Case 20 at the time of presentation. (b) We opted for the conservative treatment of taping. (c) Four months after the beginning of the treatment. (d) Nine months after, showing normal growth.

Some authors emphasize the role of exams, particularly ultrasound.^{6–10} Ultrasound imaging allows non-invasive, clear visualization of nail components in real time and effectively excluded tumoural entities and hidden complications.^{9,10} Furthermore, it would also provide chronological data of the lesion, making it possible to establish the date of the original insult.^{6,9} This could



Figure 3 (a) Retronychia. (b) Both the old and new nails can be seen. (c) Six months after the avulsion. (d) Taping is a determining factor for normal nail growth. (e) and (f) Recurrence 2 years after the surgery, without an associated traumatic episode. (g) and (h) The footwear, tight and high heels, is a cause of retronychia and in this case, seems to be the explanation for recurrence.

be done by correlating the length of the nail plates (new and old fragments) with the normal rate of growth for each digit.^{6,9} Nevertheless, this possibility requires further investigation.

Retronychia usually affects young adults with a female preponderance,^{3–6} which is consistent with our results. To the best of our knowledge, among the 70 cases described in the literature,^{1–12} the gender is only specified in 39. Of these 39 cases,^{2–4,6,8–11} 32 (82%) are female. Where the genders are given a huge female preponderance is clear.

Almost all cases occur in the big toes.⁴ There are three cases described in the fingers¹⁰ but is an exception. In our review, all cases occurred in halluces, bilaterally in six of 20 (30%) subjects. The frequent traumatization of these toes probably explains this location.⁴ Half of the patients gave a history of a precipitating event, most of them related to repetitive trauma of sports. Nine

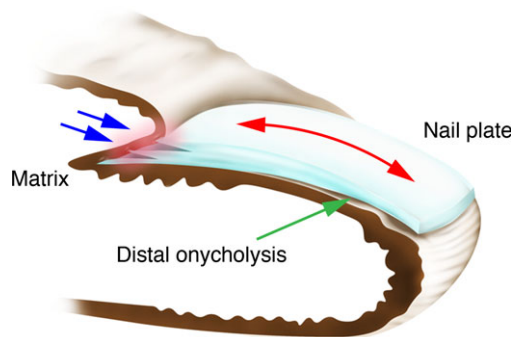


Figure 4 The nail plate is detached from the distal 80% or more of the nail bed (green arrow). This allows the plate to be pushed backward leading to rupture of the plate from the matrix at the level between the basal compartment and the keratogenous zone. Due to repeated backward movements (red arrow) the nail plate does not grow out anymore and the new plate is formed under the proximal portion of the old one. The sharp proximal margins of the upper plates are pushed against the ventral surface of the proximal nail fold (blue arrows) and eventually break through its epidermis. This causes granulation tissue (red circles), which either protrudes spontaneously from under the nail fold or pops out when there is slight pressure on the nail fold. Due to the inflammation, the proximal nail fold rounds up.

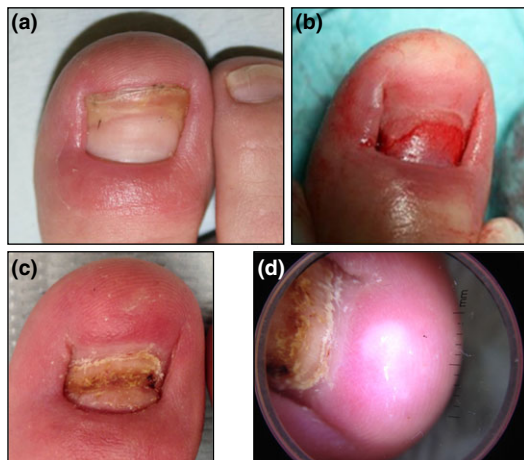


Figure 5 (a) Retronychia with 6 months of evolution. (b) Day of the surgery; this image shows the keratinization of the distal nail fold and the retraction of the distal nail bed, as a result of distal onycholysis. (c) Two weeks after the avulsion; this image shows the keratinization of the distal nail fold and the retraction of the distal nail bed, as a result of distal onycholysis. (d) Image of dermoscopy, 2 weeks after surgery; Retraction of the nail bed with epidermal keratinization to demonstrate distal onycholysis, with 6 months of evolution.

patients, regardless of sport practice, have changes in the anatomy of the foot, presenting a reflex compensatory hyperextension of the hallux, caused by hyperflexion of the other digits (claw toes), which may favour microtrauma. We emphasize the importance of microtrauma in this context that should be minimized and ideally prevented, for instance, with biomechanical study of the foot and its correction with the use of appropriate insoles, proper footwear, etc.

The conservative treatment of taping might be enough if adopted in the initial stage as reported in 25% of our cases, where it was possible to fix the nail to the nail bed, preventing retrograde movement against the proximal nail fold and allowing the nail to grow distally. Anyway, avulsion of the nail normally remains the treatment of choice of retronychia (75% of our cases) which generally resolves with no complications or recurrence,³⁻⁷ although one patient (patient nr. 10; Fig. 3) had a recurrence 2 years after the surgery, without an associated traumatic episode.

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