



DIFFERENTIAL DIAGNOSIS OF RETRONYCHIA, ONYCHOMYCOSIS AND ONYCHOMADESIS

Bianca Maria Wahlen¹, Ayman El-Menyar², Ayman Elkholy³

¹ Department of Anesthesia, Hamad Medical Corporation, Doha, Qatar

² Department of Surgery, Clinical Research of Trauma and Vascular Surgery, Hamad Medical Corporation, Doha, Qatar

³ Department of Dermatology, Andrology & STDs, Mansoura University, Egypt & Al Malakiya Clinics, Doha, Qatar

Corresponding author: Ayman El-Menyar **e-mail:** aymanco65@yahoo.com

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ABSTRACT

Background: In rare dermatology cases the differential diagnosis is challenging, e.g. when one nail is growing below another, the provisional diagnosis could be confusing. It may present as chronic paronychia, candidiasis, bacterial infections, rheumatoid arthritis, psoriasis, subungual tumours, or cysts.

Case description: We present a case of iatrogenic rupture of the nails of both big toes following a commonly known recommendation from physiotherapists in the initial stages of hallux valgus or chronic arthritis by using kinesio tape to prevent the big toe from fixation in the valgus position. The initial provisional diagnosis of retronychia was revised, and a final diagnosis of onychomadesis was made. The patient's complaint was solved after around one year without any specific therapy.

Conclusion: The differential diagnosis for onychomadesis needs a careful and detailed history that may prevent a patient from a frightening diagnosis and painful, long-lasting treatments.

KEYWORDS

Retronychia, onychomycosis, onychomadesis, big toe, kinesio tape

LEARNING POINTS

- The differential diagnosis of retronychia, onychomycosis and onychomadesis is challenging.
- Both onychomadesis and retronychia share a common pathophysiologic mechanism.
- A careful and detailed history prevents a patient from a frightening diagnosis and painful, long-lasting treatment of nail disorders.

INTRODUCTION

Worldwide, fewer than 150 cases of retronychia are described in the literature^[1-2]. Therefore, there needs to be a better understanding of the disorder, its underlying causes

and differential diagnosis to avoid a delay in diagnosis and treatment. To our current knowledge, there is no case described so far where a medical recommendation for treating chronic arthritis by using a taping technique led to





Figure 1. Plain X-ray of the foot showing first metatarsal joint arthritis.



Figure 2. Initial taping.

an initially similar picture to the already rarely described retronychia. This case report adheres to the CARE checklist.

CASE DESCRIPTION

A 53-year-old healthy female presented with the background of onychomycosis on both big toenails. The treating physician immediately denied this self-diagnosis, assuming a retronychia (shell-like nail). At the same time, a sample from one toenail was taken and sent to the laboratory to rule out

fungal infection. The microbiological result was negative for fungal infection.

For around 15 years, the patient was complaining of increasing pain in both big toe joints. Several X-rays and orthopaedic visits did not reveal any proper diagnosis. The old X-rays displayed normal joints; an X-ray later showed massive destructive arthritis (Fig. 1).

A consultation from rheumatology, as well as the laboratory results such as antinuclear antibodies (ANAs) and anti-cyclic citrullinated peptide (anti-CCP), also did not reveal a seropositive, easily treatable arthritis. The patient had, in addition, a known allergic reaction to local steroid ointment. The treating physiotherapist recommended taping both toes with kinesio (kinesiology) tape, as a common practice in similar cases (Fig. 2). The instructions had been followed precisely over almost two years, as all other attempts were unsuccessful or painful.

After two years of treatment, the patient noticed some changes in the nail near the nailbed, assuming some fungal infection, and consulted a dermatologist. The dermatologist took a video, ensuring that it was not a fungal infection, which was also ruled out by a nail clipping, which was negative for fungus.

However, after a month, it became evident that only one nail was growing under the normal nail, unlike in a retronychia, as multiple nails (Fig. 3). The new diagnosis was that there is a high likelihood that the continuous application of the kinesio tape caused a rupture (loosening) of the nail out of the nail bed, which is supported by the initial direction of growth of the second nail. The taping was stopped immediately, and after more than one year, the nail had almost entirely grown out and been replaced by a normal nail (Fig. 4), i.e. the correct diagnosis of this case was onychomadesis and not retronychia or onychomycosis.

DISCUSSION

The case history started with discomfort in bilateral big toe joints. To limit the pain and prevent deformity, kinesio tape was prescribed. Nowadays, more than 50 types of kinesio tapes are on the market, but the original was already developed fifty years ago. It has been developed as a mixture of nylon and cotton to imitate the elasticity of the skin, so motion is not limited. It supports weak zones, improves circulation, treats injuries, and enhances performance; it may also reduce pain and swelling. The intention is to keep the big toe straight until the chronic inflammation usually

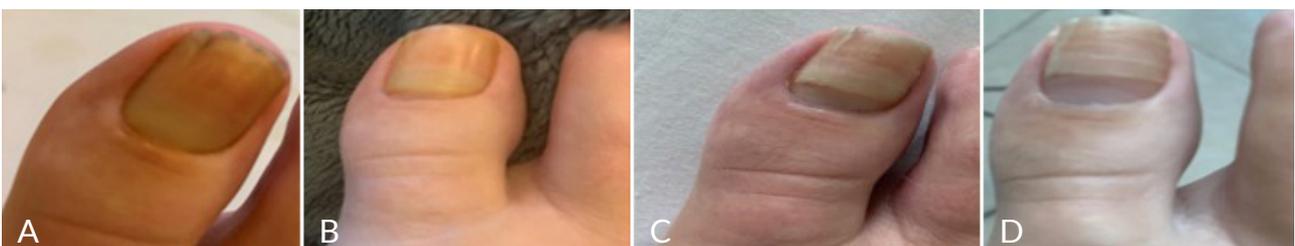


Figure 3. A) right big toe, a few weeks later displaying a fungal-like infection; B) first signs of a 'normal' nail growing underneath; C) further progress; D) one-third of the upper nail had grown out.

ends up in fixation (union of the joints and fixation of the toes). The physiotherapist suggested taping with kinesio tape for both toes, as in the case of hallux valgus^[3]. However, after continuous usage of kinesio tape for two years, both big toenail plates showed changes (two overlying layers of the nail plate are growing), which were at first differentially diagnosed as onychomycosis or starting retronychia. Negative microbiologic tests excluded onychomycosis. Hence, retronychia, which is a devastating diagnosis, was

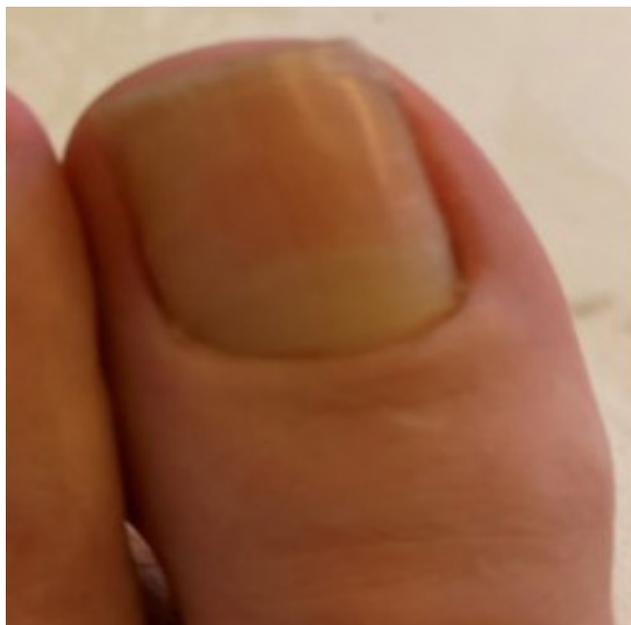


Figure 4. Left big toenail almost completely grown out (surface polished to avoid detachment of the remaining 3 mm).

the primary diagnosis. But after some time, it appeared that the correct diagnosis was onychomadesis, whose treatment is just simple observation and which has a good prognosis in contrast to retronychia, which needs surgical intervention with sometimes a bad prognosis.

Both onychomadesis and retronychia share a common pathophysiologic mechanism of inhibition of nail matrix function with cessation of nail plate production^[4], followed by reproduction of a new nail plate. Both conditions can be attributed to chronic, repeated minor trauma^[5-6]. In onychomadesis, the old nail plate is separated from the nail bed, and the old nail plate remains aligned horizontally with the nail matrix. Hence, the new nail plate pushes the old nail plate outwards until it is completely replaced^[7-8]. In retronychia, the old nail plate may remain attached to lateral wings of the nail matrix or unusually adhered to the distal nail bed, so there is a loss of alignment between the old nail plate and nail matrix, and the newly grown nail plate becomes embedded and pushes the top nail plate upwards and backwards into the proximal nail fold^[9].

Clinically, onychomadesis presents with a thickened nail plate that is eventually shed by a newly formed one. In retronychia, due to the impaction of newly formed multiple nail plates into the proximal nail fold, the nail plate becomes thick, discoloured (xanthonychia). It often looks like an oyster shell with marked onycholysis and longitudinal over curvature, a big distal bulge and a disappeared nail bed^[10]. The proximal nail fold shows paronychia, which can be mild, unnoticed or severe, with swelling and granulation tissue formation^[7].

	Onychomycosis	Onychomadesis	Retronychia
Triggering factors	Fungal infection of nail plates, primarily by dermatophytes.	Repeated minor trauma, followed by cessation of nail matrix growth. On regrowth, the old nail plate remains aligned in the horizontal axis, and the new nail plate can push the old plate outwards until it is completely replaced.	Repeated minor trauma, followed by cessation of nail matrix growth. However, there is a loss of alignment between the old nail plate and nail matrix, so the newly grown nail plate becomes embedded and pushes the top nail plate upwards and backwards into the proximal nail fold.
Clinical picture	Discoloration of the nail (white or yellow), subungual hyperkeratosis, onycholysis and onychauxis.	Thickened nail plate that is eventually shed by a newly formed nail plate.	Nail plate: thick, discoloured (xanthonychia), marked onycholysis, and longitudinal over curvature (oyster shell-like). Proximal nail fold: paronychia, with swelling and granulation tissue formation
Treatment	Oral antifungals, e.g. terbinafine, itraconazole.	Reassurance and simple observation. Sometimes urea 40% is needed.	Topical corticosteroids and antibiotics for proximal nail fold paronychia. Complete or proximal nail plate avulsion to remove the impacted nail plates.
Prognosis and outcome	Good, usually cleared within three months of antifungal therapy	Usually good	More challenging with often an adverse outcome

Table 1. Differential diagnosis.

The treatment of onychomadesis is just reassurance and simple observation. The nail defect slowly grows outwards until the nail is shed^[4] and there is treatment of any underlying offending condition to prevent recurrence^[11]. Urea, 40% cream, can promote softening and enable trimming, so it can be the primary line of treatment^[5]. While treatment and prognosis of retronychia is more difficult with often adverse outcomes^[12], for paronychia symptoms, 0.05% clobetasol propionate cream or intralesional triamcinolone acetonide can be tried for mild to moderate cases^[13]. In severe cases, the standard treatment is removing the proximal part or the entire nail plate surgically, or better still with a CO₂ laser^[13-14]. The differential diagnosis is given in Table 1^[2,5,15-16].

CONCLUSION

In some cases, the often-used medical quote: 'When you hear hoof beats, think horses, not zebras', is not always the best advice. The differential diagnosis for onychomadesis needs a careful and detailed history that may prevent a patient from a frightening diagnosis and painful, long-lasting treatments.

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