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Atypical changes in the nail apparatus in a patient with atopic dermatitis – a clinical case report

Nietypowe zmiany w obrębie aparatu paznokciowego u pacjentki chorującej na atopowe zapalenie skóry – opis przypadku klinicznego


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Abstract

Atopic dermatitis is a chronic recurrent skin disease characterised by itching and eczematous skin lesions. The paper presents the case of a 62-year-old female patient suffering from atopic dermatitis, in whom symptoms were observed within the nail apparatus of the hand, including red rings, Beau lines, lack of cuticle and lichenification with erosions, cracks, scabs, and residual blisters on the backs of the hands. The patient experienced severe itching, which led to increased manipulations within the nail apparatus (onychotillomania), which was reflected in the presence of the so-called tare nails. The patient's treatment included the use of topical medications, including clobetasol propionate, mometasone, and tacrolimus 0.1%, as well as intensive hand lubrication and the use of specialised hand cleansers. Intensification of mental health care was also recommended. The presented case highlights the importance of a comprehensive approach to the treatment of atopic dermatitis, especially in the era of new therapeutic methods.

Keywords: atopic dermatitis, human nail unit, median canaliform dystrophy of Heller, Beau lines, onychotillomania

Streszczenie

Atopowe zapalenie skóry to przewlekła, nawracająca choroba skóry charakteryzująca się świądem i zmianami wypryskowymi. W pracy przedstawiono przypadek 62-letniej pacjentki chorującej na atopowe zapalenie skóry, u której obserwowano objawy w obrębie aparatu paznokciowego dłoni – czerwone obłączki, linie Beau i brak oskórka – oraz na grzbietach rąk lichenifikację z nadżerkami, pęknięciami, strupami i resztkowymi pęcherzykami. Pacjentka odczuwała nasilony świąd, co prowadziło do wzmożonych manipulacji w obrębie aparatu paznokciowego (onychotillomania), czego wyrazem była obecność tzw. paznokci tarowatych. Zmiany te znacząco wpływały na komfort życia chorej. Leczenie obejmowało stosowanie leków miejscowych, takich jak propionian klobetazolu, mometazon, takrolimus 0,1%, oraz intensywne natłuszczenie rąk i używanie specjalistycznych środków do ich mycia. Zalecono również intensyfikację opieki psychiatrycznej. Prezentowany przypadek podkreśla potrzebę zwracania uwagi na możliwość różnych manifestacji atopowego zapalenia skóry i konieczność kompleksowego podejścia do leczenia tej choroby, zwłaszcza w erze nowych metod terapeutycznych.

Słowa kluczowe: atopowe zapalenie skóry, aparat paznokciowy, pośrodkowa kanalikowa dystrofia paznokci Hellera, linie Beau, onychotillomania

INTRODUCTION

Atopical dermatitis (AD, atopic eczema) is a chronic recurrent inflammatory dermatosis with complex multifactorial pathophysiology. Characteristic symptoms of the disease include pruritus and excessive dryness of the skin, which are the result of damage to the epidermal barrier and an abnormal immune response. Due to the intense itching of the skin and the presence of eczematous skin lesions (acute, subacute or chronic eczema type), AD significantly affects the quality of life of patients^(1,2). It should be noted that until the 1980s, AD was considered a condition exclusive to childhood, and that it was assumed that it did not occur in people over the age of 50. Currently, the prevalence in the population over the age of 60 is estimated at 1–3%⁽²⁾. Symptoms of atopic eczema show a characteristic anatomical distribution that varies depending on the age of the patient, which is used, among other things, in the diagnosis of the disease which has been based for many years on the (“golden”) criteria proposed by Hanifin and Rajka⁽¹⁾.

AD can also affect the nail apparatus (NA), but there are surprisingly few studies on this location of the disease⁽³⁾. In a meta-analysis of 101 studies (1984–2017) on regional and age-dependent manifestations of AD by Yew et al., published in 2018, the prevalence of NA lesions in patients was 11%⁽⁴⁾.

The NA is a unique, specialised, highly keratinised structure whose importance in maintaining homeostasis is often underestimated. The nail organ consists of the nail plate and four main components: the proximal nail fold (PNF) and lateral shafts, the nail matrix, the nail bed, and the periungual (hyponychium)⁽⁵⁾. Nail manifestations can be categorised according to the part of the NA affected^(3,5). Chung et al. described NA lesions in patients with AD that were associated with both the nail matrix (including Beau lines, nail plate thinning, onycholysis) and the nail bed (including brachonychia)⁽³⁾. The changes observed in NA can also be the result of medical treatment. For example, repeated exposure to sodium hypochlorite (a widely recognised agent for reducing bacterial colonisation of patients’ skin) can lead to nail dystrophy⁽⁶⁾.

We report the case of a patient with AD who presented with rare NA symptoms that were associated with the underlying disease.

CASE REPORT

A 62-year-old female patient, a blue-collar worker, presented to the outpatient clinic of the dermatology department for a routine medical check-up due to AD (Eczema Area and Severity Index, EASI: 11.8 points; pruritus – Numerical Rating Scale, NRS: 5/10; chronic course since childhood). During the dermatological examination, in addition to the typical skin lesions of the underlying disease, the following were observed in the NA of the hand: both thumbs



Fig. 1. Nails plates of fingers II–IV show Beau lines, loss of cuticle, and chronic paronychia. The nail of right finger III is washboard. Signs of chronic eczema in the course of AD are seen on the dorsal surfaces of the fingers



Fig. 2. Both washboard thumbnail plates with the presence of macrolunulae and red lanulae

and the right third finger exhibited “washboard nails”, with additional redness observed around the thumb margins. Moreover, the following were observed: the presence of discrete Beau lines on all nails and the absence of cuticle, lichenification with erosions on the backs of the hands, cracks, localised scabs, and residual vesicles (a representation of subacute and chronic eczema) (Figs. 1–3). Increased dryness of the palmar surface of the hand and deepening palmar creases (ichthyotic hand sign) were also present.

As reported by the patient, the NA lesions appeared during the last 6 months, which she associated with increased pruritus of the skin and the consequent increased manipulation in the area of the distal phalanges of the hand, especially the thumbs and the right third finger (Fig. 4). The presence of the lesions was the reason for a significant decrease in the comfort of the patient, who tried to mask this part of her body.

According to the patient’s medical history, she had allergic rhinitis (treated with loratadine on an ad hoc basis and



Fig. 3. The nail plate of right finger III with the classical washboard nail of habit tic deformity with parallel transverse ridging and damaged cuticle



Fig. 4. Typical self-manipulation by the patient (onychotillomania) with the presence of both washboard thumbnail plates

periodically with a combination of azelastine and fluticasone administered intranasally), bronchial asthma (well-controlled, treated with a complex inhaled drug containing budesonide and formoterol).

Allergologic findings included positive patch tests for chromium and nickel (allergic contact dermatitis), and positive spot tests for house dust mites, cat, dog, and horse dander. The patient tried to maintain allergen-hapten withdrawal. For 1.5 years, the patient had been undergoing allergen-specific immunotherapy procedures with a mite preparation (Novo-Helisen Depot D1/D2 50%/50% sc.). In addition, the patient had hypertension (treated with lercanidipine), depression (treated with trazodone, sertraline), and osteoarthritis (treated ad hoc with paracetamol).

For skin lesions, the patient used topical corticosteroids of medium strength on an *ad hoc* basis along with emollient therapy.

After discussion with the patient, it was decided to intensify psychiatric care as indicated (last consultation before the COVID outbreak). The patient was also advised to refrain from self-manipulation within the NA.

Topical clobetasol propionate for 7 days once a day (in the area of particular lesion severity) was prescribed. Subsequently, proactive therapy with mometasone was started and continued for a month with a gradual switch to 0.1% tacrolimus. Intensive lubrication of the hands (especially the area of the NA at least 7 times during the day) and the use of appropriate cleansers (syndets) was recommended.

The patient continues to receive ongoing dermatological and allergologic care at the centre of the authors of this report.

DISCUSSION

NA abnormalities can result from various conditions, both infectious (e.g. fungal infections, viral warts) and non-infectious dermatoses (e.g. psoriasis, lichen planus), but also systemic diseases (e.g. hypertrophic osteoarthropathy). It is noteworthy that certain drugs (e.g. chemotherapeutics) can induce changes in the nail organ, usually by affecting rapidly dividing matrix cells⁽⁵⁾.

Repeated self-manipulation leading to NA self-harm is a significant onychological problem. This group of conditions is included in the spectrum of obsessive-compulsive disorders associated with disorders of habits and drives (impulse control disorders). The range of manifestations of NA lesions caused by patients is extremely wide and includes numerous disease entities (from finger sucking to complete destruction of the nail plate in the course of extreme onychotemnomania)⁽⁷⁾.

The presented case reports a rare manifestation of onychotillomania in the course of AD. Onychotillomania is a compulsion to manipulate (using fingers, but also various tools) in the NA area of the hands and feet, leading to visible damage⁽⁷⁾. In our patient, the habit of manipulation in the PNF area (with subsequent irritation of the nail matrix below), which was exacerbated by pruritus, led to the formation of a prominent groove along the centre of the nail plate, accompanied by transverse fissures resembling the appearance of a washboard used for laundry. In addition, absence of the cuticle, enlargement of the area of the callus (macrolunula; pyramidal callus) along with its redness (the effect of extravasation associated with repeated mechanical trauma to this area) were observed.

Few cases of pathology in the NA in the course of AD have been described in the literature. In a 2020 report, Wang et al. presented the case of a 58-year-old patient suffering from AD since birth, treated with a Janus kinase inhibitor⁽⁸⁾. On dermatological examination, they found the presence

of a tarsal nail on the left thumb and Haller's medial tubular dystrophy-type lesions on the right thumb (a groove running along the centre of the nail plate, accompanied by transverse fissures resembling a fir tree in appearance). In addition, the patient's other nails showed dystrophy due to chronic paronychia, along with the presence of enlarged lunulae and loss of cuticle. All NA-related symptoms were associated with increased pruritus, which is typical of the underlying disease^(4,8). Boiko et al. described a case series of children with AD in whom osteitis of the distal phalanges of the fingers was associated with the formation of microabscesses under the nail plates. The authors of the report emphasised that the decisive role for such localisation of the lesions was the patients' scratching of the lichenified skin lesions⁽⁹⁾. In the study by Chung et al., involving a clinical analysis of a group of 235 AD patients of varying severity, NA lesions were noted in 24 patients (10.2%). Interestingly, there was no correlation between the severity of skin lesions (EASI scale) and the severity of nail lesions⁽³⁾. The past few years have seen significant changes in the approach to AD therapy. The therapeutic recommendations for AD, published under the auspices of the European Academy of Dermatology and Venereology, include several biologic drugs and small molecule inhibitors, which seems to be a revolution in the treatment, especially for patients with a severe course of the disease⁽¹⁰⁾. In 2020, a group of Italian authors reported the case of an AD patient in whom persistent lesions exhibiting the morphology of Heller's medial tubular dystrophy within the NA of the right thumb resolved after just 4 months of therapy with dupilumab (a fully human monoclonal antibody directed against the α interleukin-4 receptor – IL-4, which inhibits IL-4/IL-13-mediated signal transduction)^(11,12). Navarro-Triviño et al. observed a significant improvement in the aggravated NA lesions of the hand in a 61-year-old patient with severe AD. Interestingly, the presented patient had a history of systemic treatment with methotrexate, cyclosporin A, alitretinoin, and TNF alpha inhibitors

(adalimumab, etanercept), with no effect on nail lesions⁽¹²⁾. Zubek and Vesely also described the case of a patient with persistent severe AD, in whom nail changes (chronic thumb atrophy) occurred at the beginning of dupilumab treatment and resolved after several months of therapy. The authors suggest that in the patient, dupilumab played a dual role in both initiating and treating the lesions. Initially, the drug may have caused a transient local perturbation regarding the levels of pro-inflammatory cytokines in NA, leading to inflammation, and subsequently reduced it⁽¹³⁾. In extensive clinical analyses involving thousands of patients treated with dupilumab, no reports of drug-related nail lesions have been documented⁽¹⁴⁾.

CONCLUSIONS

According to the authors of the report, NA lesions in patients with AD are an underreported problem, but one that significantly affects the quality of life of many affected individuals. The increasing availability of new therapies that target other pathophysiological mechanisms of the disease than previously used drugs is promising for patients.

Conflict of interest

The authors report no financial or personal relationships with other individuals or organisations that might adversely affect the content of the publication or claim a right to publication.

Ethical statements

Written informed consent for publication of the case with accompanying photographs was obtained from the patient.

Author contribution

Original concept of study: AKJ, MJ. Collection, recording and/or compilation of data: AKJ, KM. Analysis and interpretation of data: AKJ, KM, AM, MJ. Writing of manuscript: AKJ, KM, MJ. Critical review of manuscript: SK, RK, AWP. Final approval of manuscript: AKJ, AWP.

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