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True leukonychia: case reports and review of the literature

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Abstract

Leukonychia refers to the whitening of the nail plate. We identified 22 cases reported in the literature. This study presents two cases of idiopathic leukonychia from Saudi Arabia, which, to our knowledge, are the first reported cases in the region. The first case involves a 26-year-old male with a decade-long history of white discoloration affecting all fingernails. He exhibited low vitamin B12 and elevated thyroid-stimulating hormone levels. The second case involves a 23-year-old female with asymptomatic white discoloration on five fingernails and a positive family history of leukonychia in her younger brother. This case series contributes to the limited knowledge of true leukonychia and emphasizes the importance of recognizing its benign nature and distinguishing it from other nail disorders.

Key words: true leukonychia; acquired leukonychia; nail disorder; white nails.

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Introduction

Leukonychia refers to the whitening of the nail plate and is classified into two types: pseudoleukonychia, resulting from external factors affecting the nail bed, and true leukonychia, which involves the nail matrix or plate. True leukonychia is further divided into four types: punctata, striata, partialis, and totalis.[1] According to Newton's theory, surfaces that reflect visible light appear white. True leukonychia is caused by abnormal matrix keratinization, which prevents visualization of the vascular nail bed, along with perinuclear vacuolization and persistent parakeratosis.[2] It may be acquired or hereditary. Acquired forms may result from chemical exposure, trauma, or infections.[3] Diagnosis is clinical, with dermoscopy assisting in distinguishing true from pseudoleukonychia. Management emphasizes nail care, avoiding irritants, and regular moisturization.[2,3] Few cases of idiopathic true leukonychia have been reported. We identified 22 cases in the literature. This study reports two cases of idiopathic leukonychia from Saudi Arabia, believed to be the first from the region.

Case Reports

Case 1

A 26-year-old healthy male smoker presented with a 10-year history of white discoloration affecting all fingernails. He works as an accountant and reported no trauma, illness, medication use, or chemical exposure. There was no family history of similar symptoms. Previous topical antifungal treatments were ineffective. Clinical examination showed opaque chalk-white discoloration of all fingernails, with no toenail involvement (Figure 1A). The color persisted under pressure. Skin, hair, and mucous membranes were unremarkable. Laboratory findings were mostly normal, except for low vitamin B12 (116 pmol/L) and mildly elevated thyroid-stimulating hormone (4.970 mIU/L). Complete blood count was normal except for elevated hemoglobin (184 g/L), attributed to smoking. Nail clippings tested negative for fungal elements using periodic acid-Schiff (PAS) and Grocott-Gomori's methenamine silver stains; cultures also showed no growth. The patient received vitamin B12 supplementation, which normalized B12 levels but did not improve nail color. Based on history and examination, idiopathic acquired true leukonychia totalis was diagnosed. The patient was reassured of the benign nature of the condition, and follow-up showed no changes in leukonychia.

Case 2

A 23-year-old healthy female presented with asymptomatic white discoloration affecting five fingernails for more than 10 years, without toenail involvement. Her younger brother had similar involvement in one fingernail. There was no history of trauma, illness, medication use, or chemical exposure.

Examination showed porcelain-white discoloration of the right index, middle, and ring fingernails, as well as the left middle and ring fingernails. The whitening affected half of the nail surface, with some nails showing concave borders (Figure 1 B,C). The color did not fade under pressure. Other nails, skin, hair, and mucous membranes appeared normal. Dermoscopy revealed diffuse white color with a smooth, transparent nail plate (Figure 2). Potassium hydroxide and PAS fungal tests were negative. Hematological and biochemical tests were all within normal limits.

Discussion

Leukonychia refers to the whitening of the nail plate. It is classified into true leukonychia, which results from abnormal kera-

tinization of the nail matrix affecting the nail plate structure, and apparent leukonychia, which arises from abnormalities in the nail bed and typically fades with pressure, as observed in conditions like liver cirrhosis, renal disease, and trauma. Pseudoleukonychia occurs when the nail plate remains structurally normal, and the white appearance is caused by external factors, such as in onychomycosis.[4]

True leukonychia can be either hereditary or acquired. Hereditary leukonychia is most commonly inherited in an autosomal dominant pattern; however, autosomal recessive cases have also been reported. It may occur in isolation or as part of syndromes. Syndromic associations include sebaceous cysts, renal stones, and deafness in Bart-Pumphrey syndrome; sebaceous cysts in Bauer syndrome; palmoplantar keratoderma in Vohwinkel syndrome; sensorineural deafness and enamel abnormalities in Heimler syndrome; neural anomalies and epiphyseal dysplasia in Lowry-Wood syndrome; and multiple malformations, including ocular hypertelorism and genital abnormalities, in FLOTCH syndrome. In addition, hereditary leukonychia has been linked to isolated findings such as pili torti, acanthosis nigricans, keratosis pilaris, duodenal ulcers, and gallstones.[5]

Acquired true leukonychia may occur without a known cause (idiopathic) or secondary to factors such as trauma, chemical exposure, arsenic or thallium poisoning, certain medications, inflammatory disorders like psoriasis, or fungal infections such as onychomycosis.[6] One previously reported idiopathic case involved a female patient whose leukonychia resolved spontaneously during pregnancy, suggesting a possible hormonal influence.[7]

In our literature review, we identified 22 published case reports of idiopathic true leukonychia (*Supplementary Table 1*).[8-23] The majority of cases involved young or middle-aged male patients. Only one report described a female patient, in whom leukonychia began with menarche and subsided during pregnancy, reinforcing the potential hormonal role.[7] However, the female patient in our study had no menstrual or hormonal associations. True leukonychia has been described across various ethnic groups. To the best of our knowledge, this report presents the first documented cases from Saudi Arabia. Most cases described in the literature appeared during adolescence or early adulthood, consistent with the age of onset in our patients.[24] True leukonychia affecting the toenails has also been reported in association with hallux valgus, appearing as longitudinal half-and-half nails.[25] In another case, bilateral true leukonychia resolved after correction of a low zinc level.[26] Both of our patients had normal serum zinc concentrations (12 µmol/L and 11 µmol/L, respectively). Although low vitamin B12 levels have not been widely reported as a cause of leukonychia, our first patient did have a deficiency. Interestingly, a previous report documented improvement of leukonychia in a child following a 7-month course of multivitamin supplementation, including vitamin B12, despite initially normal laboratory values.[27]

Conclusions

Idiopathic leukonychia is a rare, benign, acquired condition that may be mistaken for systemic disease or fungal infection. Greater awareness of its clinical features can help prevent unnecessary investigations and prolonged treatment.

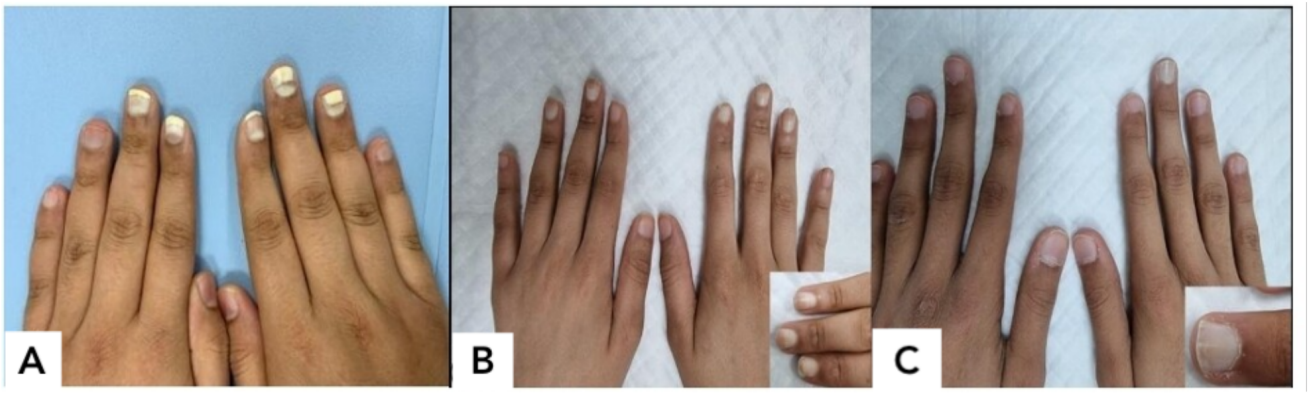


Figure 1. A) Idiopathic leukonychia in a 26-year-old male showing chalk-white discoloration of all fingernails; **B**) porcelain white discoloration on the fingernails of a 23-year-old female; **C**) similar discoloration on the single fingernail of her younger brother.

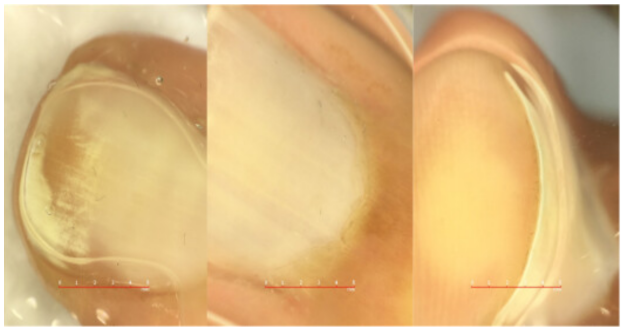


Figure 2. Dermoscopic image showing diffuse white color with a smooth nail plate.

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Supplementary Table 1. Summary review of reported cases of idiopathic leukonychia.

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Ethics approval and consent to participate: all procedures were conducted in accordance with the ethical standards of the responsible institutional and national committees on human experimentation, and with the 1964 Helsinki Declaration and its 2013 revision. All patients provided written informed consent to participate.

Consent for publication: written informed consent for the publication of clinical images and case details was obtained from the patients involved in this study.

Availability of data and materials: all data generated or analyzed during this study are included in this article. Further inquiries can be directed to the corresponding author.

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