

Review

Leukonychia

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Abstract

Background: Leukonychia is the white discoloration of the nail plate. There are many subtypes of leukonychia. True leukonychia, which occurs due to pathology in the matrix; pseudoleukonychia, is caused by the changes of nail bed. True leukonychia is subdivided as total and partial leukonychia. Total leukonychia may be genetic or associated with systemic diseases. Partial leukonychia is usually caused by trauma. Partial leukonychia can be classified as punctate, transverse and longitudinal. Three different types of pseudoleukonychia can be distinguished; half and half nails, *Terry's* nails and *Muehrcke's* nails.

Introduction

Leukonychia is the white discoloration of the nail plate. It was first described in the end of 19th century [1]. Leukonychia has many subtypes [2] (Figure 1). True leukonychia is attributable to matrix dysfunction. Apparent leukonychia is due to changes in the underlying tissue, pseudoleukonychia is used when the nail plate alternation has an external origin, such as in onychomycosis or in keratin granulations observed after nail enamel applications [3]. Leukonychia can be congenital or acquired. Congenital leukonychias can be a phenomenon or can be determined with other diseases. There are a lot of causes of acquired leukonychia. Causes of leukonychia is showed at Table 1 [1].

The nail plate has a normal surface but loses its transparency and looks white because of the presence of parakeratotic cells within its ventral portion. Parakeratotic cells have immature large nucleus which

has keratohyalins in it. The cells that have keratohyalin reflect the light, and because of this the nail seems white [4].

True Leukonychia

White discoloration of the nail attributable to matrix dysfunction occurs in various patterns. True leukonychia is subdivided as total and partial leukonychia. There is a rare, inherited form called total leukonychia, in which all nails are milky porcelain white in color. In subtotal leukonychia, the proximal two-thirds are white, becoming pink distally. This is attributed to a delay in keratin maturation, and the nail may still appear white at the distal overhang [5]. The partial leukonychia is caused by trauma secondary to manicure or another manipulation [6].

Total Leukonychia

Total leukonychia is usually an autosomal dominantly inherited condition. It can be also autosomal recessive inherited [7]. In



Figure 1. Some leukonychia types: 1) Leukonychia partialis; 2) Leukonychia totalis; 3) Leukonychia striata; 4) Leukonychia transversalis; 5) Leukonychia punktata.

autosomal dominantly inherited form, it can be a part of *Bart-Pumphrey Syndrome* in which there is also knuckle pads and deafness or *Buschkell-Gorlin Syndrome* in which there is also sebaceous cysts and renal calculus. Conditions that may cause total leukonychia include typhoid fever, leprosy, cirrhosis, nail biting, trichinosis and cytotoxic drugs [2].

Table 1. Causes of Leukonychia

Congenital
Leukonychia only
Leukonychia with koilonychia
Leukonychia with knuckle pads and deafness
Leukonychia totalis, multiple sebaceous cysts and renal calculi
Acquire
Addison disease
After the treatment with antimetabolites
Cardiac failure
Systemic lupus erythematosus
Arsenic poisoning
Exfoliative dermatitis
Hodgkin disease
Infectious fever
Menstrual cycle
Myocardial infarct
Leprosy, malaria, pneumonia
Pellagra
Thallium poisoning
Tuberculosis
Trauma
Herpes zoster
Fungal infections
Tuberculosis
Zinc deficiency
Trichinosis

Partial Leukonychia

Partial leukonychia can be thought as a phase of total leukonychia. There is a possibility that one patient has partial leukonychia and total leukonychia in several periods of time in life [1]. Tuberculosis, Hodgkin disease, metastatic carcinoma, leprosy can cause partial leukonychia, or it may be idiopathic [8]. There are three morphologic variants of partial leukonychia; punctate, transverse and longitudinal leukonychia [2].

In transverse leukonychia, the nail plate shows multiple transverse white opaque parallel lines [3]. It is frequently observed in the fingernails of women, in whom the cause is matrix trauma secondary to manicure. It may also occur in great toenails as a consequence of trauma from shoes. White bands parallel to lunula are sometimes diagnostic for arsenic poisoning. They are called *Mees's lines*. Conversely, various systemic conditions can also cause transverse leukonychia similar to *Mees's lines*. Infectious diseases, especially with a high fever, such as acute respiratory infections, measles, malaria, herpes zoster and leprosy, can induce white nail bands [9].

Punctate leukonychia is the most common type and it occurs in normal individuals. The nail plate shows small opaque white spots that move distally with nail growth and usually they disappear in time. Punctate leukonychia can not be explained by just abnormal keratinization. Besides parakeratosis, the air that goes in between the cells may cause this appearance. It is also caused by trauma [2]. Punctate leukonychia is seen in alopecia areata. The pattern and number of spots may change as the nail grows [5].

Longitudinal leukonychia is 1mm white longitudinal lines and it is under the nail plate. It may be associated with *Darier's disease* [3].

Pseudoleukonychia

This term is used when the white discoloration is caused by the changes of nail bed. Three different types of pseudoleukonychia can be distinguished, *Terry's nails*, *Muehrcke's nails* and half and half nails [11].

Terry's Nails

Terry's nails were described by *Terry* in 1954 as a common sign of liver cirrhosis, occurring in up to 82 % of patients. The leukonychia affects the whole nail except for a 1-2 mm distal band. In one study, it is shown that the brown lines are attributed to telangiectasia in the dermis [6]. In *Terry's* nails, the proximal part of nail is white and the distal part is pink or brown [2]. Brown lines may be seen in chronic renal failure disease, it also may be seen in normal individuals [11]. The type that affects the whole nails is attributed to cirrhosis, congestive cardiac failure and adult-onset diabetes mellitus [6].

Half and Half Nails

The proximal area is dull white and the distal area (20-60 percent of the total length) is brownish. There is a distinct border between the colors [3]. It is described as proximal pallor and distal brown-yellow pigmentation of the nail plate and it was estimated that approximately one third of all haemodialysis patients would exhibit this characteristic nail [10]. In psoriasis pseudo half and half nails may be seen [6].

Muehrcke's Nails

Muehrcke's nails were described by *Muehrcke* in 1956 in patients with hypoalbuminemia (nephrotic syndrome) [4]. The nail has multiple transverse whitish bands, parallel to the lunula. The pathogenesis of this condition can not be solved yet. It is thought that the edema in the nail plate can cause these bands by pressuring the under-

lying vessels. Hypoalbuminemia, chronic liver diseases and malnutrition can cause *Muehrcke's* nails [11].

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