

# A case of hypomelanosis of Ito accompanied by unilateral abnormal limb overgrowth and delayed speech

 Mustafa Ozcetin,<sup>1</sup>  Ayse Kilic,<sup>1</sup>  Yakup Cag,<sup>2</sup>  Fuat Bilgili,<sup>3</sup>  Busra Aksoy<sup>1</sup>

<sup>1</sup>Department of Pediatrics, Istanbul University Istanbul Faculty of Medicine, Istanbul, Turkey

<sup>2</sup>Department of Pediatrics, Dr. Lutfi Kirdar Kartal Training and Research Hospital, Istanbul, Turkey

<sup>3</sup>Department of Orthopedics and Traumatology, Istanbul University Istanbul Faculty of Medicine, Istanbul, Turkey

## ABSTRACT

Hypomelanosis of Ito (HI) is characterized by unilateral or bilateral hypopigmented skin lesions and usually presents as a multisystemic disorder. Skin lesions may develop in different textures, such as linear, whorled, or patchy, and are often accompanied by abnormalities of the central nervous system, skeletal system, eyes, and teeth. HI is associated with sporadic gene mutations but not gender. Presentation of the current case may be of use in reminding practitioners of the common extracutaneous findings of HI along with some rare manifestations, like delayed speech and asymmetric limb growth.

*Keywords:* Delayed speech; hypomelanosis of Ito; limb asymmetry.

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**H**ypomelanosis of Ito (HI) was first described by Minor Ito in 1952 as ‘incontinentia pigmenti achromians’, a mosaic cutaneous disorder [1, 2]. It is the third most common neurocutaneous disorder following neurofibromatosis and tuberous sclerosis [2]. Pigmented lesions may be discernible at birth, though they can become accentuated during childhood as well. A wide variety of phenotypes are seen depending on the underlying mutations. The skin findings are characterized by hypopigmented lesions following the Blaschko lines, as do several other congenital and acquired dermatological conditions. These lines form an ‘S’ shape over the trunk, a ‘V’ shape over the back, a linear pattern over the limbs, and a wavy pattern on the head; they are thought to reflect the previous migration routes of embryonic cells [3]. Hypomelanosis of Ito can present with characteristic solitary, whorl-like, linear, or patchy skin lesions follow-

ing the Blaschko lines, but it can also appear as a part of a complex malformation syndrome accompanied by extracutaneous findings [1–4]. In fact, these extracutaneous manifestations are seen in 76% to 94% of cases and frequently involve the central nervous system, musculoskeletal system, and eyes [2]. Asymmetric hypertrophic overgrowth has also been reported [5]. Herein, we report on a case of HI accompanied by unilateral abnormal limb overgrowth and delayed speech.

## CASE REPORT

A 5.5-year-old girl was brought to our hospital with a complaint of disproportionate overgrowth and lengthening of the right leg accompanied by marked hypopigmented lesions over the trunk and legs, which reportedly had become noticeable by 2-weeks postpartum and grad-

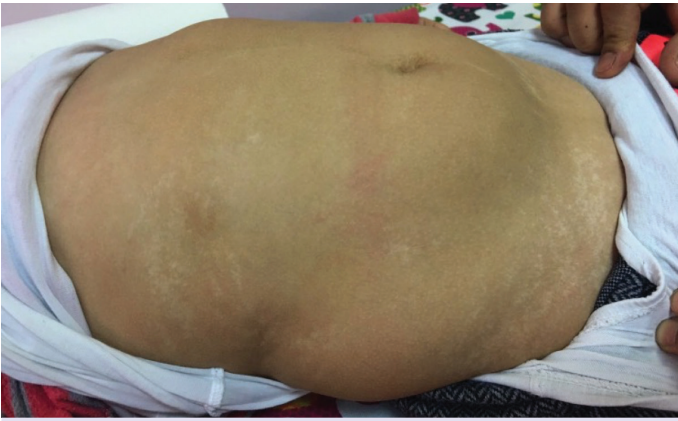
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**Correspondence:** Dr. Mustafa OZCETIN, Istanbul Universitesi, Istanbul Tıp Fakultesi, Çocuk Sağlığı ve Hastalıkları Anabilim Dalı, 34680 Istanbul, Turkey.

Tel: +90 532 724 89 39 e-mail: mozcetin@gmail.com

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**FIGURE 1.** Hypopigmentation following the lines of Blaschko in a patient with hypomelanosis of Ito.



**FIGURE 2.** Linear hypopigmented patches located in the front aspect of the leg.

ually increased and spread. She was born to non-consanguineous parents and had been under monitoring for delayed speech. On examination, her height and weight were 110 cm (10<sup>th</sup> to 25<sup>th</sup> percentile) and 23 kg (75<sup>th</sup> to



**FIGURE 3.** Body asymmetry with the right leg thicker and longer than the left leg.

90<sup>th</sup> percentile), respectively. The dermatological examination was remarkable for hypopigmented patches following the Blaschko lines over the trunk and both legs, more prominently on the right leg (Figs. 1, 2), which was thicker and longer (~2 cm) than the left (Fig. 3). Apart from these findings, the systemic examinations, routine haemogram and biochemical tests, and magnetic resonance scans of the cranium and lower extremities were normal. When the Denver Developmental Screening Test was administered for speech delay, it was graded as 'delayed', correlating with an age of 3.5 years. After consultation with the dermatology department, a skin biopsy was considered unnecessary.

## DISCUSSION

Although HI was initially defined as only a cutaneous disease, several reports of extracutaneous involvement have led to a tendency to regard it more as a neurocutaneous syndrome [2]. A wide variety of HI phenotypes

can be seen depending on the underlying mutation. Skin manifestations are characterized by hypopigmented lesions following the Blaschko lines. The streaks and whorls of these lesions may be present at birth or appear later during childhood, especially in light-skinned individuals. Hypomelanosis of Ito is associated with sporadic gene mutations without any predilection for gender [6]. Histological studies are of limited diagnostic value due to the lack of characteristic variation, though an examination of the hypopigmented lesions of some cases demonstrated a decrease in the size and number of melanosomes in the basal layer of the epidermis [7]. In our case, the hypopigmented lesions were typical, following the Blaschko lines, and a skin biopsy was not performed because of the unlikelihood of a typical histopathological finding.

Hypomelanosis of Ito can be accompanied by abnormalities of the central nervous system as well as others involving the musculoskeletal system, eyes, hair, and teeth. A wide variety of coexisting conditions have been reported in the literature, including mental and motor retardation, hypotonia, hyperkinesia, ataxia, epilepsy, impaired or delayed speech, facial and limb asymmetry, and kyphoscoliosis. Given this wide range of accompanying abnormalities, Ruiz-Maldonado et al. [8] proposed a set of HI diagnostic criteria in 1992. In addition to congenital or early acquired nonhereditary cutaneous hypopigmented streaks or patches present on at least two parts of the body, the major criteria included coexisting abnormalities of the nervous system or musculoskeletal system, while the minor criteria included congenital malformations involving other systems or chromosomal anomalies. The diagnosis can be made when the presence of skin involvement is accompanied by two major criteria or one major criterion plus two minor criteria. In our case, the cutaneous involvement was accompanied by delayed speech and overgrowth in the right leg. In the absence of a histological assessment, the terms 'overgrowth' or 'abnormal growth' are more appropriate terms than 'hyperplasia' (abnormal cell proliferation) or 'hypertrophy' (abnormal growth in the size of the existing cells) [5]. Reports on the association between HI and asym-

metric limb overgrowth are rare in the literature, and a systematic study is still lacking.

There is no specific treatment for HI. It is suggested that should suspected skin lesions appear, a comprehensive systemic examination be made. Infants, especially girls, should be assessed at least every 3 months in the first year of life with respect to the developmental progression of the lesions as well as of head growth and mental development [9]. The presentation of this case should provide a useful reminder of the common extracutaneous findings of HI as well as some of its rare manifestations such as delayed speech and asymmetric limb growth.

**Informed Consent:** Written informed consent was obtained from the patient for the publication of the case report and the accompanying images.

**Conflict of Interest:** No conflict of interest was declared by the authors.

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