Scholars Journal of Medical Case Reports
Abbreviated Key Title: Sch J Med Case Rep
ISSN 2347-9507 (Print) | ISSN 2347-6559 (Online)
Journal homepage: https://saspublishers.com/journal/sjmcr/home

OPEN ACCESS

Three Familial Cases of Clouston Syndrome

Lahlou F*, El Fetoiki FZ, Hali F, Chiheb S

Dermatology-venereology's service, HUC Ibn Rochd, Casablanca

***Corresponding author:** Lahlou F
| **Received:** 14.03.2019 | **Accepted:** 26.03.2019 | **Published:** 30.03.2019
DOI: 10.36347/sjmcr.2019.v07i03.017

Abstract **Case Report**

Clouston syndrome is a form of ectodermal dysplasia that appears as a triad of clinical findings: palmoplantar keratoderma, nail dystrophy, and hypotrichosis. This study reports three cases of clouston syndrome: a father and his two children with universal hypotrichosis and onychodystrophy and normal sweating. The children lack hyperkeratosis and morphologic abnormalities of the teeth as originally described in Clouston syndrome. Management involves the use of special hair care products to help manage dry and sparse hair; wigs; artificial nails; and emollients to relieve palmoplantar hyperkeratosis.
Keywords: Clouston syndrome, Hidrotic ectodermal dysplasia, Nail dystrophy, Palmoplantar keratoderma, Alopecia, Hypotrichosis.

INTRODUCTION

Clouston syndrome or hidrotic ectodermal dysplasia is a form of ectodermal dysplasia, characterized by abnormalities of the hair, nails, and skin, with the sweat glands being unaffected. Here we report 3 cases of the same family with typical clinical features of Clouston syndrome.

OBSEVATIONS

A 11-year-old boy presented to our Department with fine and sparse hair. He also complained of alopecia of eyelashes and eyebrows (figure 1) and absence of body hair (figure 2) and also reported thickening of the nails (figure 3). According to the mother's report, there was no history of consanguinity or abnormality in sweating; the boy's 50-year-old father (figure 4) and 8-year-old sister (figure 5) also showed same clinical features.

Physical examination of the boy and his sister revealed nail plate dystrophy. Micronychia of all 20 nails was observed. The fingernails were discoloured, hyperconvex and slowgrowing. The scalp hair was very sparse, brittle and fine in some places and totally absent in other places (figure 6), and absence of hair on the limbs. They showed no dental changes or hyperkeratosis of the palms and soles.

The father, denied any history of deafness, diminution of vision, redness, or watering of the eyes. On examination, the scalp hair, beard, eyebrows, eyelashes, moustaches, and pubic and axillary regions was absent. The nails were yellowish-brown and thickened. There was no associated paronychia. General body hair was also absent. Intraoral examination revealed absence of teeth, the patient reported that he lost all his teeth the last 10 years.

Systemic examination of the three patients including ophthalmological examination was unremarkable. Physical tests for hearing were normal. The individual's clinical findings (the classical triad of onychodystrophy, universal hypotrichosis, and palmoplantar hyperkeratosis with normal sweating) were compatible with the clinical diagnosis of Clouston syndrome; however, the diagnosis was not confirmed with molecular genetic testing. The father was referred to a specialized dental rehabilitation center for prosthetic rehabilitation.

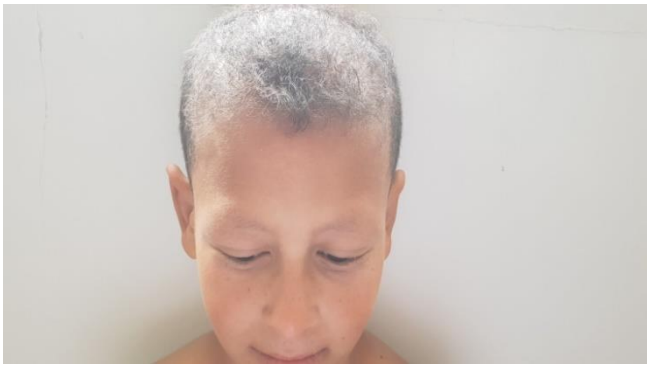

Fig-1: Alopecia of eyelashes and eyebrows

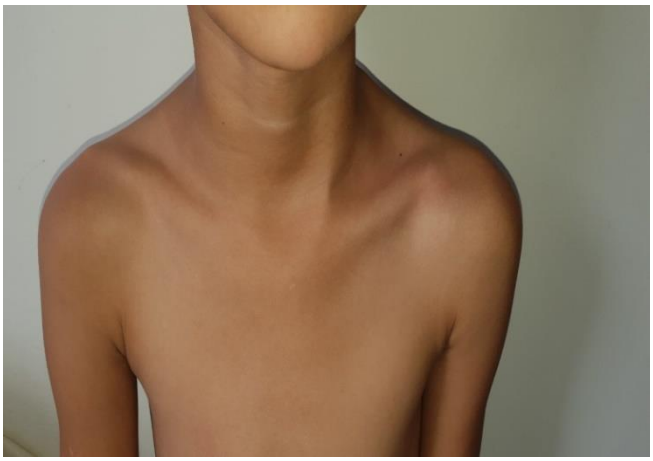

Fig-2: Absence of body hair

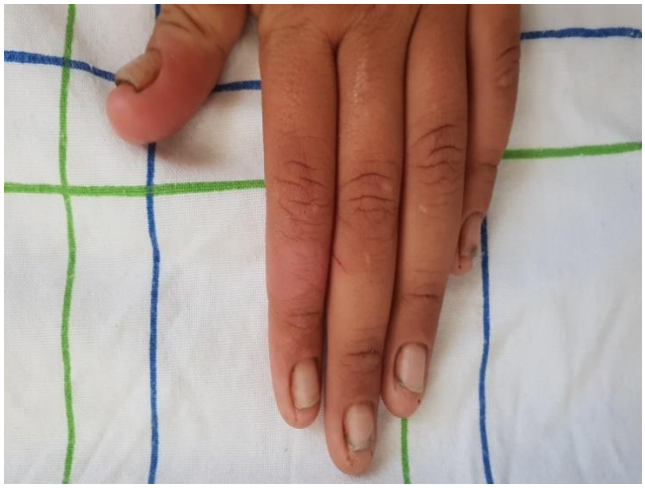

Fig-3: Nail plate dystrophy, micronychia of all 20 nails, fingernails are discoloured, hyperconvex and slowgrowing

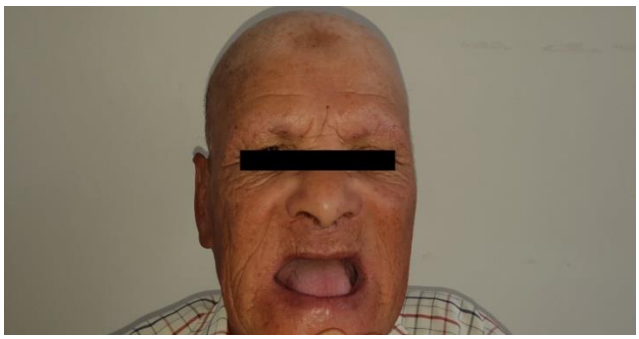

Fig-4: The scalp hair, beard, eyebrows, eyelashes, moustaches are absent With absence of teeth

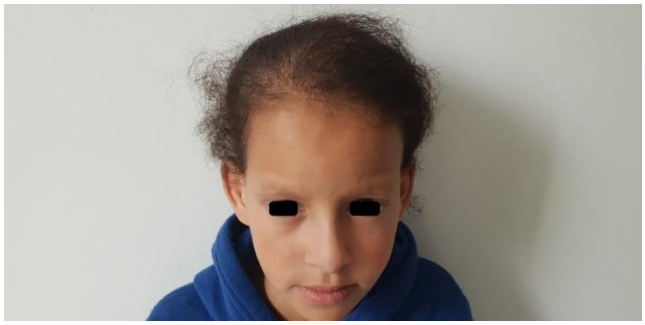

Fig-5: Alopecia of eyelashes and eyebrows with sparse scalp hair

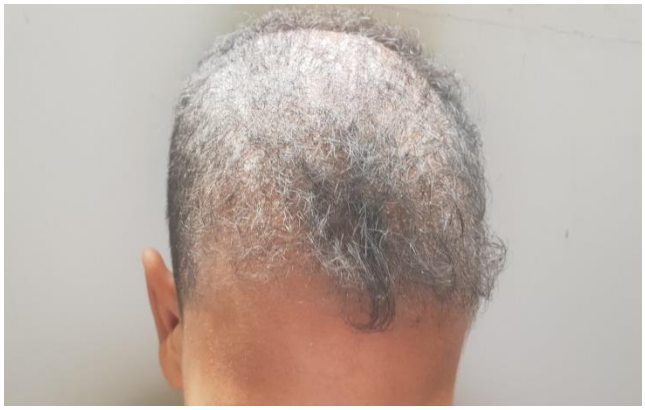

Fig-6: Scalp hairs are very sparse, brittle and fine

DISCUSSION

Clouston syndrome is a rare autosomal dominant genetic disorder caused by heterozygous mutation in the GJB6 (gap junction protein β6) gene, which encodes connexin-30, on chromosome 13q12. Connexin-30 belongs to a family [1]. Four mutations were found in Clouston syndrome patients: G11R, V37E, D50N and A88V [2]. All of wich lead to nonsynonymous amino acid substitutions.

The main features of Clouston syndrome are

Nail dystrophy (malformed, thickened, small nails) in approximately 30% of affected persons. They may be milky white and gradually become dystrophic, thick, short, and distally separated from the nail bed with increased susceptibility to paronychial infections. Nail growth is slow.

Hypotrichosis (partial or total alopecia). The scalp hair is patchy, sparse, pale, wiry and brittle as in the two children. Progressive hair loss may lead to total alopecia, usually by pubert as in their father. The eyebrows are sparse or absent. The eyelashes are short and sparse. Axillary and pubic hair is sparse or absent.

Palmoplantar keratoderma (hyperkeratosis of the palms and soles); a common but not universal finding, increases in severity with age; actually the father have palmoplantar hyperkeratosis not his son and daughter.

Manifestations of the disorders are not clinically apparent in most newborns. Dental, hair, and nail anomalies usually become evident during infancy or childhood. A family history of similar clinical features is helpful.

Most of the people affected by this disease are of French Canadian descent but it has been described in people of other ancestries like German, Danish, Welsh, Chinese, and Russian

HED2 is relatively common in the French-Canadian population of southwest Quebec [3]. Clouston syndrome has also been reported in the US, particularly in Vermont, upstate New York, and Louisiana among communities of French-Canadian ancestry; but it has been described in people of other ancestries like Indian, Irish, Scottish, Chinese, Malaysian, russian and Ashkenazi Jewish ancestry [2, 4, 5-7].

In 1929, Clouston described members of a large French Canadian family with a form of ectodermal dysplasia affecting predominantly the nails, hair, and skin. Sweating was normal [8]. Other reports described an extensive kindred of French extraction that migrated to Canada, Scotland, and northern United States [9-12]. Rajagopalan and Tay described autosomal dominant hidrotic ectodermal dysplasia in 15 members of a Chinese family in Malaysia [13]. All patients had typical nail, hair, and skin lesions. Scalp alopecia was more extensive in females, whereas keratoderma of the palms and soles was more notable in males. Hassed et al. described a family with a hair-nail

dysplasia in 10 persons through 4 generations [14]. Patients had features consistent with Clouston syndrome, without hyperkeratosis and dental caries. They noted that dental abnormalities had not been reported in other families with Clouston syndrome. They proposed that dental abnormalities, typical of other ectodermal dysplasias, are not a usual component of the Clouston syndrome. In our observations, children don't have dental abnormalities nor palmo-plantar hyperkeratosis but their father does.

The appearance of the hands and feet can be improved by artificial nails, especially for young women. No special pharmaceutical agent is available to improve hair growth. A combination of topical tretinoin and minoxidil is proposed as a rational treatment of choice in congenital hypotrichosis associated with syndromes such as ectodermal dysplasias [15, 16]. The efficacy and safety of long-term treatment needs to be explored further. In some cases of severe alopecia, wigs are helpful to improve appearance.

Palmoplantar keratoderma reduce quality of life for many. Limited acral functionality and pain besides the hyperkeratotic lesions are frequent complaints. Topical therapies such as topical emollients, topical urea and salicylic acids relieve the symptoms.

For patients with dental defects, an international consensus meeting of experts in pediatric dentistry, orthodontics, and prosthodontics has published recommendations for the diagnosis, evaluation, and treatment of patients with ectodermal dysplasia, including use of dental implants [17, 18]. Advise orthodontic treatment for cosmetic reasons and to ensure adequate nutritional intake.

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