Case report

Vohwinkel's syndrome: Case report and review of literature

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Abstract Vohwinkel's syndrome is a rare, autosomal dominant disorder of keratinization characterized by palmoplantar keratoderma and ainhum-like constrictions. We report herein a 20-year-old girl with palmoplantar hyperkeratosis with a honeycomb-like appearance, constricting band in her left little finger and nail changes. However, certain other features like deafness and neurological changes were not seen.

Introduction

Hereditary palmoplantar keratodermas (PPK) are a heterogeneous group of disorders of keratinization, the hallmark of which is a diffuse/localized thickening of palms and soles. The molecular defects in all of them have not been elaborated and these are differentiated on the basis of distribution of involvement (diffuse/insular/punctate), associated systemic features, mode of inheritance, age of onset, histopathological features, response to therapy, and prognosis.[1,2]

Vohwinkel's syndrome (VS), s*ynonyms:* mutilating keratoderma, keratoderma hereditarium mutilans, keratoma hereditara mutilans, is an autosomal dominant type of PPK with nonspecific histopathological changes. Classically, it is a triad of: a) diffuse palmoplantar keratoderma with a honeycomb-like appearance, b) star-shaped hyperkeratotic plaques on the dorsa of hands, feet, knees, and elbows; and c) fibrous constriction band involving interphalangeal joints leading to autoamputation. A number of inconsistent clinical features can occur.[1,2] Herein, we report a 20-year-old girl with this syndrome who lacked systemic involvement.

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Case report

A 20-year-old female patient presented in the out-patient clinic of our department with the complaint of palmoplantar keratoderma.

She was born to a consanguineous couple by vaginal delivery after an uneventful pregnancy. At the end of first year of postnatal life, her mother noticed the hardening of palms and soles which worsened over the ensuing years. At the age of 16 years, she developed a fibrous band around her right 2nd toe which gradually deepened and ultimately ended in self-amputation of the toe. Her mental and physical development was normal. There was no history of recurrent infections, teeth loss, photosensitivity, photophobia, sweating abnormalities, deafness, muscle weakness or walking disability. Rest of the systemic inquiry was also normal. She had 5 sisters and one brother, out of these two sisters were affected with a similar disease (**Figure 1**).

Examination of the patient revealed diffuse yellowish thickening of the palms and soles, honeycombed by small

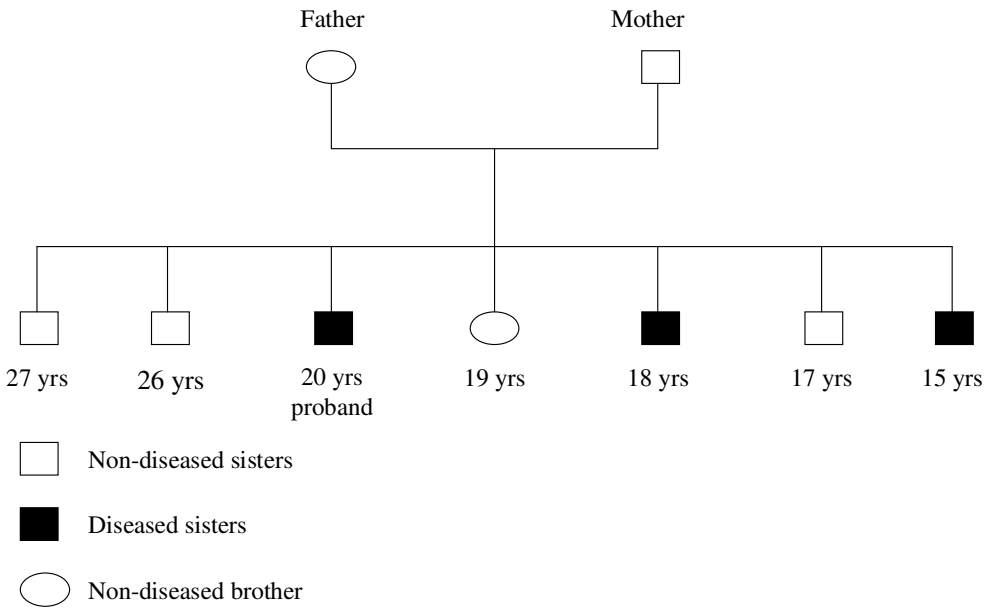

Figure 1 Family tree of the patient

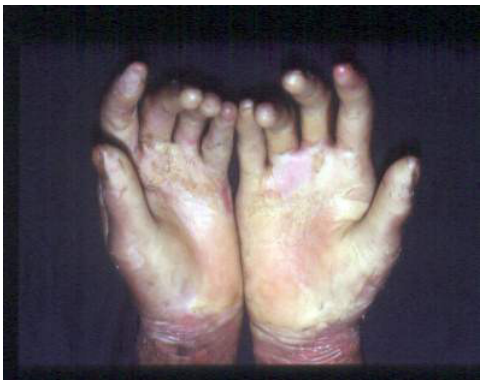

Figure 2 Diffuse palmoplantar keratoderma with honeycomb-like appearance

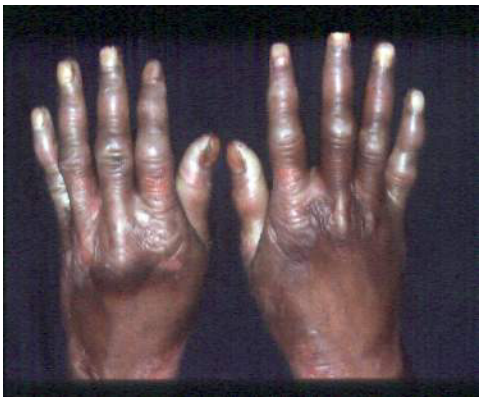

Figure 3 Hyperkeratosis encroaching on the dorsum of hands (transgrediens).

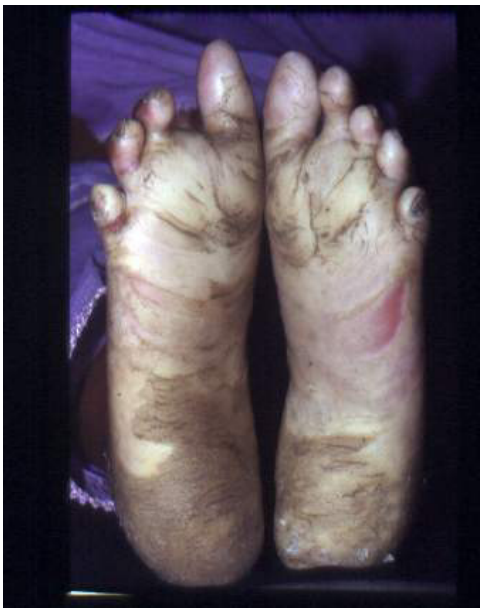

Figure 4 Loss of right second toe resulting from autoamputation.

depressions (**Figure 2**), encroaching on dorsum of hands and feet (**Figure 3**), but there was no perilesional erythema. A constricting fibrous band was seen around the middle of her left finger. There was loss of right 2nd toe (**Figure 4**). Nails showed gross thickening with horizontal

Table 1

Clinical features described in Vohwinkel syndrome [1,2]

- Congenital alopecia universalis
- Pseudopelade-type alopecia
- Acanthosis nigricans
- Deafness
- Deafness-mutism
- High-tone acoustic impairment
- Ichthyosiform dermatitis
- Spastic paraplegia/myopathy
- Nail changes
- Mental retardation
- Bullae on soles
- Cleft lip and palate[19]
- Microcephaly[19]
- Facial asymmetry[19]

ridges, onychogryphosis, and loss of cuticle. There were no perioral, perinasal, perineal keratoses or erythema, starfish-shaped keratoses on the dorsa of the fingers and knees, linear keratoses on the flexor aspect of forearms, sclerodactyly and flexion contractures of fingers. Hair, mucous membranes, and teeth were normal. Similarly, ocular, auricular, neurological, and musculoskeletal examination was normal.

The following investigations were normal; full blood counts, serum chemistry, and urinalysis. Audiometry didn't reveal any acoustic impairment. X-ray of hands show osteoporotic changes distal to the band. Histopathology from palmar skin revealed prominent hyperkeratosis, focal parakeratosis, hypergranulosis and papillomatous acanthosis. Mild perivascular mononuclear infiltrate was present in the dermis. Genetic studies could not be done due to unavailability.

Patient was advised topical keratolytics and oral acitretin but she declined retinoids.

Discussion

The constellation of clinical features, histopathology and a positive family history led to the diagnosis of Vohwinkel's syndrome. In the differential diagnosis various hereditary palmoplantar keratodermas with constriction of digits were considered. These included mal de Meleda, Olmsted's syndrome, pachyonychia congenita, acral keratoderma, palmoplantar keratoderma of Gamborg Nielsen. Since genetic and molecular defects have not been elaborated in all these conditions, they are differentiated on clinical grounds mainly.

Mal de Meleda is an autosomal recessive disorder in which there is progressive palmoplantar thickening leading to glove and stocking-like distribution. It is usually associated with eczema. Hyperhidrosis, perioral erythema, and nail thickening or koilonychia are present.[3] Olmsted's syndrome another rare PPK, is also characterized by autoamputation of fingers but additionally periorificial, perineal, and perianal plaques, and deformities of the nails, teeth, and joint have been described.[3,4] In pachyonychia congenita, constriction of fingers has been reported but grossly thickened curved nails are the characteristic feature. Secondly the PPK is focal and not diffuse. Leukokeratosis of oral mucosa is also seen.[3] Acral keratoderma also has strong resemblance to VS but the lack of star-shaped keratoses is characteristic.[3,5] Palmoplantar keratoderma of Sybert is also an autosomal dominant disease with clinical similarities to VS; however, the involvement of the groins and gluteal cleft and groins along with PPK is a consistent finding. Electron microscopy shows abnormal structure and distribution of keratohyalin granules.[6] PPK of Gamborg Nielsen is another autosomal recessive

disease closely resembling VS but it has typical ultrastructural characteristics.[7,8]

There are also many non-hereditary diseases which may cause constriction bands with or without keratoderma e.g. pseudoainhum, ainhum, leprosy, yaws, scleroderma, discoid lupus erythematosus, syringomyelia, tumours of spinal cord, ergot poisoning, amniotic bands or hair producing constriction of fingers.[1,2] However, these conditions were not considered due to the absence of typical physical and histological findings and negative appropriate laboratory tests.

The prototype patient described by Vohwinkel[9] in 1929 was a 24-years-old female who had diffuse, honeycomb-like palmoplantar keratoderma along with fibrous constriction bands. Since then many cases have been described in dermatological literature with different names like keratoderma hereditarium mutilans, mutilating keratoderma and Vohwinkel's syndrome. Keratoderma usually starts during infancy or early childhood whereas fibrous constriction bands occur at 10-20 years of age. Starfish-shaped keratoses are also a characteristic feature of VS. Different clinical features reported in VS are enumerated in **Table 1**.

In most individuals the disease is inherited in an autosomal dominant pattern; however, recessive type and sporadic cases have occasionally been described.[10] Two mutations of epidermal differentiation complex have been identified in VS. In the classic (hearing loss-associated) VS, there is a missense mutation of *GJB2* gene coding connexin-26, a gap junction protein. This mutation has been mapped on chromosome 13q11-13.[11] In the Camisa (ichthyosis-associated) variant an insertional mutation of loricrin gene has been found and mapped on chromosome 1q21.[12] The same mutation has been identified in other ethnic groups.[13]

There are several reports of successful treatment of keratoderma and digital constriction with systemic retinoids, greatly improving the functional disability and quality of life.[14-16] Z-plasty has also been recommended in selected cases.[17]

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