

## Papillon-Lefevre Syndrome: A Case Report and Review of the Literature

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**ABSTRACT.** Papillon-Lefevre syndrome is a rare autosomal recessive syndrome associated with palmoplantar keratoderma and early onset periodontal disease that results in loss of the teeth. *Actinomyces Actinomycetemcomitans* causing

periodontal damage, and alterations in the polymorphonuclear leukocyte function have been postulated or probable pathogenetic mechanism. Early recognition of this entity as well as a multidisciplinary management may help in the prognosis of these cases.

**P**apillon-Lefevre syndrome (PLS), described in 1924, is a rare disease with an occurrence rate in the general population of 1 to 4 cases per million.(1) It is characterized by localized or diffuse hyperkeratosis of the palms and soles and extensive destruction of alveolar bone, thus resulting in premature loss of teeth. The etiology is unknown, but it is considered to be transmitted as an autosomal recessive trait.(2) No racial or gender differences seem to exist.(3)

Direct cultures from periodontal pockets and antibody studies suggest an association with the organism *A. actinomycetemcomitans*.(4,5,6) Other factors have been considered such as alteration of the host immune response due to a deficiency in the chemotactic and phagocytic function of polymorphonuclear leukocytes.

We report a case recently seen at our Dermatology Clinic, with a review of the medical literature.

### Case History

This is a 13 year-old girl born in the Dominican Republic who suffered from keratoderma of soles since age 3. Her mother had also noticed gingival erythema, swelling and easy loss of deciduous teeth. None of the family members shared similar findings and there was no history of consanguinity between the parents. Upon physical examination, the patient presented a marfanoid habitus with adequate development for age. On palms and soles there were well-demarcated keratotic plaques (Fig. 1). Similar lesions were seen at elbows, knees and knuckles; The nails were not affected. There was gingival



Figure 1. Well-demarcated keratotic plaques on the soles.

swelling with accentuation around the remaining teeth. The lower canines were present, but loose; the lower incisors were absent (Fig. 2).



Figure 2. Gingival swelling with loss of teeth.

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## Discussion

In 1924, Papillon and Lefevre described this syndrome as "keratodermie palmaire et plantaire". It is considered an autosomal recessive disease different from Mal de Meleda and the autosomal dominant Unna-Thost keratoderma. In these conditions, the oral findings are not an integral part of the disorder. It is also different from the Haim-Munk syndrome, which presents diffuse palmar keratosis, arachnodactylia, claw-shaped deformity of distal phalanges and periodontosis.(7)

The main feature associated with PLS is the triad (8) of premature loss of primary and secondary dentitions due to loss of alveolar bone and gingival inflammation, palmoplantar hyperkeratosis with transgrediens, often including elbows and knees, and calcification of the tentorium and choroid plexus.

The keratoderma may appear at birth, or more frequently between six months to four years of age.(9) The soles are more frequently involved, presenting well-defined plaques with erythema and transgrediens. Other skin surfaces such as knees, elbows and trunk are involved less frequently. Hypohydrosis, recurrent pyoderma, thumb nail dystrophy, regional lymphadenopathy,(9) liver abscesses(15) and acroosteolysis are occasionally seen.(10)

The most striking features of PLS are the oral manifestations, usually with simultaneous onset with the keratoderma. The pathognomic dental features are the looseness, hypermobility, migration and exfoliation of teeth without signs of root resorption. The loss of teeth is accompanied by inflammation of the gingiva. By age 4-5, the deciduous teeth are lost or extracted, resulting in an edentulous child, with resolution of the gingival inflammation. The process is repeated by adolescence, when the permanent teeth are lost. Although the etiology and pathogenesis are not well defined, several factors have been suggested to be responsible for the pathological changes seen in PLS(9):

1. Virulent gram-negative anaerobic organisms are found in the plaque and periodontal pockets. *A. actinomycetemcomitans* constitutes more than 50% of the total colony-forming units(9,11) with increased antibody titers to this organisms.(13) The presence of bacteria alone is not sufficient to produce the periodontal disease and a genetically susceptible host is theorized to be necessary.
2. Deficient phagocytic function with a marked decrease in the chemotactic activity of polymorphonuclear leukocytes that results in increased susceptibility to infections in about 25% of the cases.(12)

3. Immune-mediated deficiency with a reduced lymphocyte response to pathogenic organisms. This hypothesis is suggested by a diminished Th and monocytic function with increased IgG levels(9), decreased number of CD45RO (+) "memory/hyperreactive" T cells and a parallel reduction in the amount of these cells in the periodontal tissue, exposing the mucosa to chronic bacterial infections.(15)

The treatment of this devastating disease is usually ineffective. Among the therapeutic interventions to stabilize the periodontal inflammation are the oral antimicrobials such as tetracycline or ofloxacin, following the susceptibility charts of the pathogens isolated in the dental pockets. Mouthwashes with chlorhexidine, root planing and teeth extraction are used concomitantly. The purpose is to eliminate the deep pockets that function as an ecological niche for the most commonly described pathogens.

The treatment of the skin lesions includes topical steroids, emollients and keratolytics. Etretinate is studied as a promising agent in the management of the inherited keratodermas, including the dental manifestations of PLS(9-14)

PLS is generally a devastating disease with high incidence of resistance to conventional treatments. Severe periodontosis and loss of teeth is rapidly progressive. Hopefully, genetic and microbiological studies will shed light in the discovery of the relationship between the skin and the dental manifestations, its pathogenesis and further therapeutic interventions.

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