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Case Report

Papillon Lefevre Syndrome – A Case Report with 10 Years Follow Up

Easwaran Ramaswami[1]*, Nazmul Alam[2], Girish Patil[2] and Hemant Umarji[3]

[1]*Associate Professor, Department of Oral Medicine and Radiology, Government Dental College, Mumbai, India*

[2]*PG Student, Department of Oral Medicine and Radiology, Government Dental College, Mumbai, India*

[3]*Professor and HOD, Department of Oral Medicine and Radiology, Government Dental College, Mumbai, India*

***Corresponding Author:** Easwaran Ramaswami, Associate Professor, Department of Oral Medicine and Radiology, Government Dental College, Mumbai, India.

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Abstract

Papillon Lefevre Syndrome is a rare autosomal recessive genetic disorder which affects the periodontium and also shows cutaneous manifestations. In this paper a case of Papillon lefevre syndrome is presented in which involvement of deciduous and permanent dentition was observed over 10 years of follow up period. The patient finally received complete denture prosthesis for rehabilitation.

Keywords: Autosomal Recessive Disorder; Cathepsin C; Early Onset Periodontitis; Papillon Lefevre Syndrome; Palmar Plantar Keratosis

Introduction

Papillon Lefevre Syndrome (PLS) is characterised by hyperkeratosis of hands and feet and by a generalised aggressive periodontitis in both primary and permanent dentition [1]. It is a rare autosomal recessive trait with an estimated prevalence of 1 - 4 cases per million persons in general population and the carrier frequency appears to be 2 - 4 per thousand population with no sexual predominance [1-4]. In 1924, two French physicians Papillon and Lefevre first described this rare genodermal condition, in a brother and sister suffering from palmo-plantar hyperkeratosis associated with early onset periodontitis and premature loss of deciduous as well as permanent dentition [5].

The pathogenesis of Papillon-Lefevre Syndrome is still controversial however the recently identified genetic defect in PLs has been mapped to chromosome 11q14-q21, which involves mutations of Cathepsin C activator [6,7]. The Cathepsin C gene is expressed mainly in the epithelium region such as palms, soles, knees, and keratinised oral gingiva. These are generally the areas that are most commonly affected by PLS. The gene is also expressed at high levels in various immune cells including Polymorphonuclear Leukocytes, Macrophages and their precursors.

All PLS patients are homozygous for the Cathepsin C mutations inherited from a common ancestor. Parents and siblings, heterozygous for Cathepsin C mutations do not show either the palmoplanter hyperkeratosis or severe early onset periodontitis characteristic of PLS [9].

Rapid destruction of the periodontium which is unresponsive to treatment is the hallmark of the oral manifestation of this syndrome. Following the deciduous tooth loss, the gingival appearance resolves and may well return to health only for the process to be repeated as the permanent dentition starts to erupt [1]. The majority of teeth are lost by the age of 14 - 15 years [1,4,5] resulting in atrophied edentulous jaws.

In this paper a case of PLS involving the deciduous and permanent dentition is reported with a 10 years follow up.

Case Report

A 4 ½ year old male child, reported to our department in April 2006 with the chief complaint of spontaneous exfoliation of teeth. According to his mother, deciduous teeth had started erupting by around 6-8 months of age. Child was completely alright up to about one month back when his teeth started shedding spontaneously accompanied by bleeding gums. Subsequently other teeth also started shedding one after the other. There was no history of trauma, fever or swelling. As gathered from information given by the parents, the patient suffered from trauma at the age of 6 months which resulted in the fracture of femur. He developed pyemic liver abscess at the age of 1 year. During infancy there was a history of skin eruptions and pneumonia which healed subsequently with due care.

Physical examination of the patient revealed that he was moderately built with a steady gait. His physical and mental development was also normal for his age. The skin appeared dry with normal development of hair and nails. There were yellowish brown, hyperkeratotic plaques affecting the skin of his palms and soles as seen in figure 3. Teeth present were 52, 53, 55, 61, 62, 63, 65, 73, 75, 83, 84, 85. There was generalised gingival inflammation and bleeding on probing with grade III mobility of all the existing deciduous teeth (Figure 2). There was caries with 63, 75, 85 and palatal abscess with 65. Panoramic radiographic evaluation showed severe periodontal bone loss with the deciduous teeth with 63, 64, 84, 85 with a floating tooth appearance. Tooth buds of all permanent teeth except third molars were present. Root resorption was seen with 65, 75, 84 and 85. Basal bone condition appeared to be normal (Figure 4).

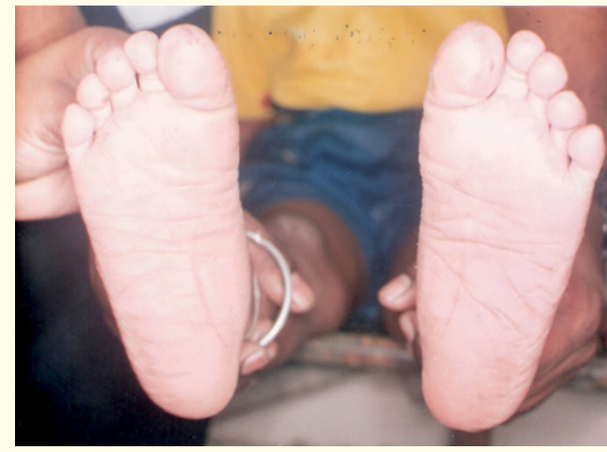

Figure 3: Photograph of foot showing severe plantar keratosis.

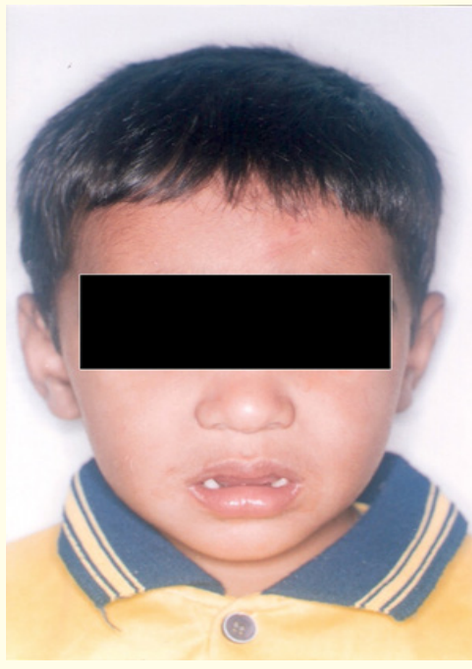

Figure 1: Extraoral picture of patient when he was 4 years old.

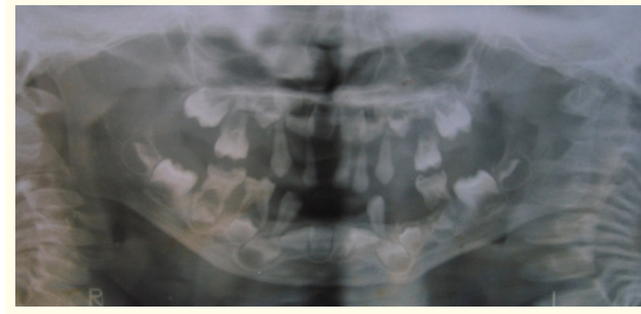

Figure 4: Orthopantomogram at the age of 4 years showing severe periodontal destruction of the remaining teeth and tooth buds of erupting permanent teeth.

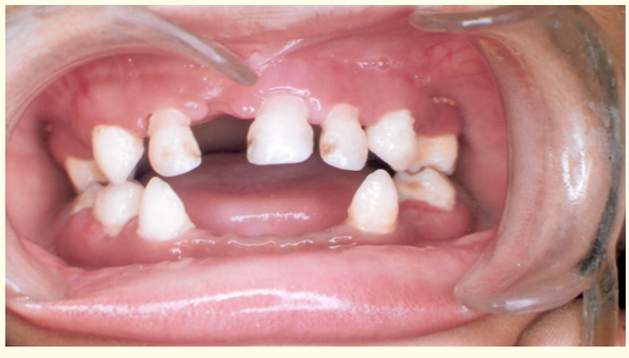

Figure 2: Intraoral picture at 4 years of age showing tooth loss and periodontal destruction of anterior region.

Thus based on the clinical presenting features of premature and spontaneous exfoliation of deciduous teeth, severe periodontal destruction and presence of palmar and plantar keratosis a provisional diagnosis of Aggressive periodontitis associated with Papillon Lefevre syndrome was established. Periodontal therapy was performed and the child was kept under observation and subjected to periodic follow up thereafter. However the periodontal destruction continued and soon all the deciduous teeth exfoliated.

The permanent teeth erupted normally but were soon affected by severe periodontal disease and started exfoliating spontaneously. This had created a psychological trauma to the child who felt social embarrassment and finally dropped out of school.

During the present examination in July 2016 the following findings were observed.

On intraoral examination only few teeth were present (12, 13, 18, 28, 37, 38, 45, 46, 48) with grade III mobility with generalised gingival inflammation and bleeding on probing (Figure 5).

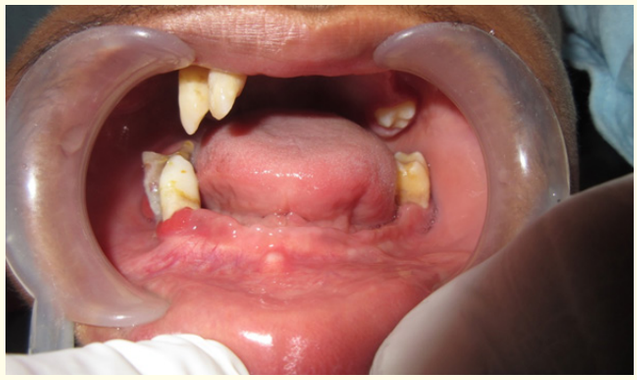

Figure 5: Intraoral picture at 15 years of age showing tooth loss and periodontal destruction.

Yellowish brown hyperkeratotic plaques were also present on his palms and soles as seen in figure 6 and 8. OPG showed severe periodontal destruction and giving upper teeth a hanging tooth appearance and lower teeth a floating in air appearance (Figure 7).

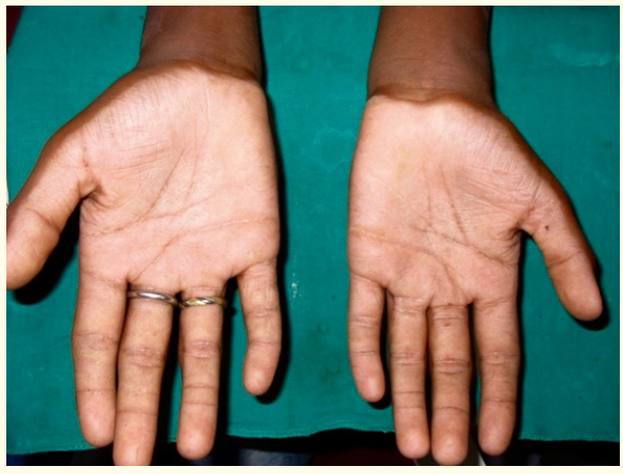

Figure 6: Photograph of hand showing palmar keratosis.

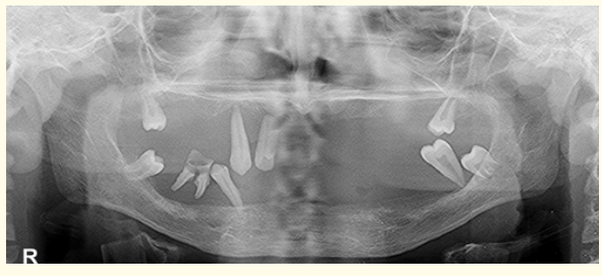

Figure 7: Orthopantomogram at the age of 15 years showing severe periodontal destruction of the remaining teeth.

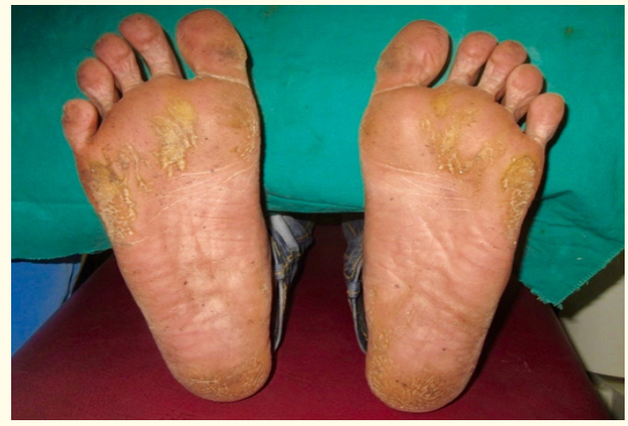

Figure 8: Photograph of foot showing plantar keratosis.

Considering the poor prognosis of all the teeth were extracted and complete dentures were made.

Implant therapy was postponed until the patient attained skeletal maturity.

After the insertion of complete denture there was a marked improvement not only in his oral function and aesthetic but also in his personality.

Discussion

PLS is an autosomal recessive inherited disorder [9]. In 1924, Papillon and Lefevre initially described the syndrome [10]. This condition predominantly demonstrates oral and dermatological manifestations [10]. PLS is suggested to be because of mutation in the Cathepsin 'C' gene located on chromosome 11q14.1-q21 [8].

This Cathepsin 'C' gene encodes for cysteine lysosomal protease known as Dipeptidyl-Peptidase I. It removes dipeptides from amine terminals of the protein substrates. This gene is expressed in epithelial regions and in various immune cells like PMNLs, Macrophages and their precursors. In PLS, most severely affected regions are the gingiva of oral cavity, skin of palms and soles [9].

Lysosomal Protease Enzyme is necessary for maintaining the balance between oral microflora and immune system through protein degradation and pro-enzyme activation. alteration sin Cathepsin 'C' gene leads to altered host response too pathogenic micro-organisms in dental plaque [4].

PLS patients are susceptible to *Actinobacillus actinomycetemcomitans, Capnocytophaga, Cytomegalovirus* and Epstein Barr virus which play an important role in the pubertal periodontitis.

Reverse ratio of T-helper and T killer cells, disruption of fibroblast and cementoblast function, altered function of monocytes and lymphocytes also play an important role which leads to defective periodontal ligament attachment and gingival epithelium [8]. The disorder is characterised by diffuse palmo-plantar keratoderma and rapidly progressing periodontitis leading to premature loss of both deciduous and permanent teeth. A third component of dural calcifications has also been reported by Gorlin., *et al.* [12], Almuneef., *et al.* [13] recognised pyogenic liver abscess to be a fairly frequent complication of Papillon Lefevre Syndrome a finding noted in the present case.

Papillon-Lefevre Syndrome exhibits a prevalence of one to four per million people in the population, and carriers are thought to be present in 2-4/1000person [10].

The dermatological lesions appear first between the ages of 1 to 4 years and include palmo-plantar keratosis, varying from mild psoriasiform scaly skin to overt hyperkeratosis. The lesion may be aggravated by cold [1].

Mutation in Cathepsin 'C' gene results in PLS, Haim-Munk Syndrome (HMS) and Pre-pubertal periodontitis which are closely related to PLS. HMS is autosomal recessive genodermatological disorder characterised by palmo-planter hyperkeratosis and periodontitis, while other important clinical findings in HMS are recurrent pyogenic skin infections, aero-osteolysis, atrophic changes in nails, arachnodactyly and fingers having tapered pharyngeal ends and these cutaneous findings have been reported to be more severe and extensive as compared to PLS [14].

The characteristic intra-oral presentation of PLS is severe periodontitis which may be seen by 3 - 4 years of age. The eruption of deciduous dentition is normal but associated with severe gingival inflammation and subsequent periodontal destruction leading to premature loss of primary dentition. Gingival tissue appears to be healthy for a short period of time followed by another phase of destructive periodontitis when the permanent teeth erupt. Affected individuals may thus become partially or completely edentulous in their early teen.

Features of PLS found in our patients:

1. Inflamed and swollen gingiva
2. Bleeding on probing on slight provocation
3. Mobility of teeth
4. Deep intra bony pockets
5. Severe alveolar bone loss
6. History of early loss of both deciduous and permanent teeth
7. Lesions subside with exfoliation of teeth
8. Hyperkeratotic papules present on palms and soles
9. Teeth development, form and eruption were normal
10. At the time of tooth eruption, the gingiva becomes erythematous and swollen and after eruption it manifests bleeding on probing on slight provocation
11. After exfoliation or removal of tooth, the gingiva regains normal appearance
12. Negative family history
13. History of liver dysfunction

According to Ullbro., et al. there is no association between degree of palmo-plantar hyperkeratosis and severity of periodontitis [15].

Other conditions like acrodynia, hypophosphatasia, histiocytosis X, leukemia, cyclic neutropenia are also associated with generalised periodontitis and premature loss of teeth. There are some conditions like Howel Evans Syndrome, keratosis punctata, Vohwinkel's Syndrome, Greither's Syndrome which cause palmoplantar keratosis. So such conditions should be differentiated from PLS.

Conclusion

The PLS not only causes Palmar-plantar keratosis but also renders the unfortunate patient edentulous at the very young age. This in turn causes difficulty in mastication, speech and deglutition and severe psychological trauma as the patient is ridiculed by school mates and friends. One such case of PLS with a long term follow up and reasonably satisfactory outcome is presented.

Bibliography

1. Hattab FN., *et al*. "Papillon-Lefevre syndrome: A review of literature and report of 4 cases". *Journal of Periodontology* 66.5 (1995): 413-420.

2. French D., *et al*. "Papillon Lefevre syndrome associated early onset periodontitis: A review and case study". *Journal of the Canadian Dental Association* 61.5 (1995): 432-438.

3. Abdulwassie H., *et al*. "Papillon Lefevre syndrome, I-Reappraisal of etiology, clinical features and treatment, II- Oral rehabilitation using osseointegrated implants". *Indian Journal of Dental Research* 7.2 (1996): 63-70.

4. Cury VF., *et al*. "A novel mutation of the cathepsin C gene is Papillon- Lefevre syndrome". *Journal of Periodontology* 73.3 (2002): 307-312.

5. Papillon MM and Lefevre P. "Deuxcas de keratoderma palmaire et plantairesymmetrique familial (maladie de Meleda) chez le frère et la soeur: coexistence dans les deuxcasd' alterations dentaire graves". *Bulletin De La Societe Francaise De Dermatologie Et De Syphiligraphie* 31 (1924): 82-87.

6. Page RC and Baab DA. "A new look at the etiology and pathogenesis of early-onset periodontitis. Cementopathia revisited". *Journal of Periodontology* 56.12 (1985): 748-751.

7. Van Dyke TE., *et al*. "The papillon-lefevre syndrome: Neutrophils dysfunction with severe periodontal disease". *Clinical Immunology and Immunopathology* 31.3 (1995): 419-429.

8. Laass MW., *et al*. "Localisation of gene for Papillon-Lefevre Syndrome to chromosome 11q14-q21 by homozygosity mapping". *Human Genetics* 101.3 (1997): 376-382.

9. Kaur B. "Papillon Lefevre Syndrome: A Case Report with Review". *Dentistry* 3 (2013): 156.

10. Neville B., *et al*. "Textbook of Oral and Maxillofacial Pathology". (First South Asian Edition) (2016): 159-161.

11. Schroeder HE., *et al*. "Behaviour of neutrophillic granulocytes in a case of Papillon Lefevre Syndrome". *Journal of Clinical Periodontology* 10.6 (1983): 618-635.

12. Gorlin RJ., *et al*. "The syndrome of palmoplantar hyperkeratosis and premature periodontal destruction of the teeth". *Journal of Pediatrics* 65 (1964): 895-908.

13. Almuneef M., *et al*. "Pyogenic liver abscess and Papillon-Lefevre syndrome: not a rare association". *Pediatrics* 111.1 (2003): e85-e88.

14. Hart TC., *et al*. "Haim Munk syndrome and Papillon Lefevre syndromes are allelic mutation in Cathepsin C". *Journal of Medical Genetics* 37.2(2001): 88-94.

15. Ullbro C., *et al*. "Osseointegrated implants in a patient with Papillon Lefevre syndrome: a 4 ½ year follow up". *Journal of Clinical Periodontology* 27.12 (2000): 951-954.

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