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PAPILLON LEFEVRE SYNDROME: A CASE CHALLENGE AND LITERATURE REVIEW

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Abstract:

A rare autosomal recessive disease Papillon lefevre syndrome is caused by mutation in the cathepsin C gene which is positioned at chromosome 11q14.1-q14.3 and other etiological factors such as endocrinopathy, generalized epithelial dysplasia and vitamin A deficiency, genetic, immunologic and microbiologic. It is presented with early loss of permanent and primary teeth, hyperkeratosis of hands and feet and aggressive periodontitis. Diagnosis is made on basis of history, clinical examination, urine analysis and genetic mapping. The cases discussed have esthetic and functional concerns. Our cases were presented with initial loosening and then loss of some of the erupted permanent teeth, aggressive periodontitis and excessive bone loss which was seen by radiographic examination. Treatment required a multi-disciplinary approach. Extraction of the teeth with grade 3 mobility was advised in all these cases and they were recalled after 3 weeks of healing for impression taking to form removable partial denture and complete denture. Maintenance of oral hygiene by brushing twice daily and use of mouth wash was recommended and for hyperkeratosis of hands and feet, the patients were referred to a competent dermatologist. The patients agreed to the treatment plan except our 3rd case who was 20 years old female.

Conclusion: *Early diagnosis and management with the early extraction of teeth having grade 3 mobility with prophylactically use of antibiotics can prevent the excessive bone loss and for periodontitis oral retinoid can be given.*

Key words: *Papillon lefevre syndrome*

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INTRODUCTION:

A rare autosomal recessive disease Papillon lefevre syndrome (PLS) caused by mutation in the cathepsin C gene which is positioned at chromosome 11q14.1-q14.3 (1). Other factors involved in PLS is decrease in functioning of lymphocytes, polymorph nuclear leukocytes or monocytes (2). PLS is found in approximately 1-4 per million occurring with 1-5 years of age. It is prevalent equally in males and females. In PLS early loss of permanent and primary teeth, hyperkeratosis of hands and feet and aggressive periodontitis are most common features (1). Other features are intra-cranial calcifications, bacterial infections and mental retardation (3). Diagnosis is made on history, clinical examination, urine analysis and genetic mapping. Treatment requires a multi-disciplinary approach and depends on the extent of involvement ranging from symptomatic treatment to investigational therapies. Here we present 3 cases having characteristic features of PLS. The aim is to emphasize the facilitation of such special cases to ameliorate their living condition.

CASE NO.1

Clinical Presentation

An 11-year-old female patient belonging from a low socioeconomic background presented to the Oral Medicine Clinics at Riphah International University with a complaint of initial loosening followed by loss of some erupted permanent teeth and difficulty in chewing. Intraoral examination revealed loss of some erupted teeth like upper lateral incisors and first premolars and lower central and lateral incisors, grade 3 mobility of upper central incisors, grade 2 mobility of lower right canine and edematous gingiva, all determining generalized aggressive periodontitis see figure no. 1a and 1b. Periodontal pocketing ranges from 1mm-4mm with a few teeth showing false pocketing as well and vertical dimensions of occlusion was reduced. Her extra oral examination revealed hyperkeratotic thickening and scaling of skin of palms, soles and knees see figure 1c, 1d, 1e, 1f and1g. Radiographic examination showed excessive bone loss see fig no.1h. Papillon lefevre syndrome was diagnosed on the basis of her clinical picture. In her past medical history she had consulted a dermatologist for hyperkeratosis of skin and he had prescribed a moisturizer which is not beneficial for the patient. The child's father revealed that no other sibling was affected. She was very disturbed due to severe halitosis, difficulty in eating and was not confident to face the society.

1a

1b

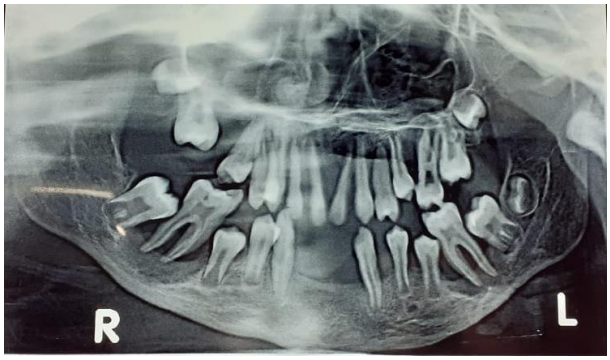
1c

1d

1e

1f

1g



1h

CASE NO.2

Clinical Presentation

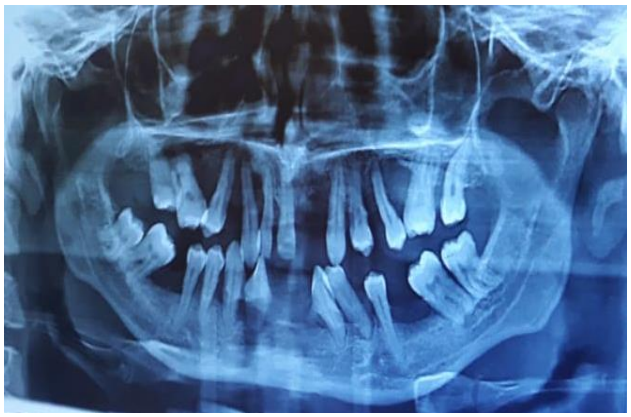
A 24-year-old male patient belonging from a low socioeconomic background presented to the Punjab Dental Hospital Lahore with a complaint of initial loosening followed by loss of some erupted permanent teeth. Intraoral examination revealed loss of some erupted teeth like upper right 1st premolar, upper left central and lateral incisor and lower right central incisor,1st molar ,lower left central and lateral incisor. Grade 3 mobility of upper right lateral incisor, canine, 2nd premolar, 1st molar and upper left 2nd premolar. Grade 2 mobility of lower right lateral incisor, canine and lower left canine, 1st premolar and edematous gingiva, all determining generalized aggressive periodontitis see figure no. 2a and 2b. Periodontal pocketing ranges from 1mm-8mm with a few teeth showing false pocketing as well and vertical dimensions of occlusion was reduced. His extra oral examination revealed hyperkeratotic thickening and scaling of skin of palms and soles and pitting on palms see figure 2c and 2d. Radiographic examination showed excessive bone loss see fig no.2e. He was diagnosed with PLS on the basis of his clinical picture and radiographic examination. In his past medical history he had taken antibiotics and consulted many medical doctors for his skin lesions. He revealed that no other sibling was affected.

2a

2b

2c

2d



2e

CASE NO.3

Clinical Presentation

A 20-year-old female patient belonging from a low socioeconomic background presented to the Punjab Dental Hospital Lahore with a complaint of initial loosening followed by loss of some erupted permanent teeth, difficulty in chewing and esthetically unpleasant look. Intraoral examination revealed loss of some erupted teeth like upper right canine, 1st and 2nd premolars , upper left central and lateral incisors, canine and 1st and 2nd premolars and lower right 1st molar, lower left canine. Grade 3 mobility of upper central and lateral incisors and grade 2 mobility of upper left 1st molar and edematous gingiva, all determining generalized aggressive periodontitis see figure no. 3a, 3b and 3c. Periodontal pocketing ranges from 1mm-5mm with a few teeth showing false pocketing as well and vertical dimensions of occlusion was reduced. Her extra oral examination revealed hyperkeratotic thickening and scaling of skin of palms and soles figure 3d and 3e. Patient was non affording and refused to have radiographic examination. Papillon lefevre syndrome was diagnosed on the basis of her clinical presentation. In her past medical history she had only taken home remedies. Her past dental history revealed that a quack fixed her lower anterior teeth by using self-cure acrylic material. Large calculus deposit was present in lower anterior region. She revealed that her elder sister was also affected but did not get any treatment. This was a result of cousin marriage as her parents were cousins. She refused to get any treatment.

3a

3b

3c

3d

3e

Differential Diagnosis: Haim–Munk Syndrome, Hypophosphatasia

Diagnosis: Papillon Lefevre Syndrome

Management

Patients and the families were counselled regarding the syndrome. Treatment plan was made to satisfy functional demand of the patients. Extraction of the teeth with grade 3 mobility was advised. In case of our 24years old male patient none of the teeth were suitable as abutment so extraction of all teeth and replacement with complete denture was advised. Patients were recalled after 3 weeks of healing for impression taking. For our female patients initially removable partial denture was advised. Maintenance of oral hygiene by brushing twice daily and use of mouth wash was recommended to all patients and for hyperkeratotic skin lesions the patients were referred to a competent dermatologist. The patients agreed to the treatment plan except the 20 years old female patient she refused to get any treatment. Her lower teeth were fixed by a quack using self-cure acrylic material which was also advised to be removed immediately as it can further complicate her dental health.

Referral:

Patients were referred to oral maxillofacial surgery department for extraction of teeth having grade 3 mobility and then the prosthodontic department for fabrication of removable partial denture for both the female patients and complete denture for the male patient.

DISCUSSION:

Most characteristic features of PLS are dental and dermatological lesions along with calcification of the

duramater (4). In our all cases early loss of most of the permanent teeth along with hyperkeratotic thickening and scaling of skin of palms, soles and knees were most prominent features. In children having PLS calcification of dura, falx cerebri, tentorium cerebelli and choroid plexus and different types of abscesses such as pyogenic liver abscess, lung abscess and renal abscess has been documented (5) but in our cases it was not investigated due to limited resources and patients had no such symptoms indicating such medical complaints. Patients having PLS also suffers from hyperhidrosis (excessive perspiration) (8) but in our cases, patients had no such complaint. Dry nails, radiographic changes such as tapered and pointed ends of fingers are some other features(6) but our patients had clinically normal nails and shape of fingers with hyperkeratotic thickening of skin of palms. Etiological factors of PLS are endocrinopathy, generalized epithelial dysplasis, Vit. A deficiency (4) genetic, immunologic and microbiologic i.e, disturbance of immune system and neutrophils chemotaxis (4).

Actinomycetemcomitans, Porphyromonas gingivalis and Prevotella intermedia were identifiend in the subgingival plaque of the patients by Robertson et al (4). Fusobacterium nucleatum, and Treponema denticola also have significant role in periodontitis (7). In our case periodontal pocketing ranges from 1mm-4mm in case of our 1st case, 1mm-8mm in our 2nd case and 1mm-5mm in 3rd case with a few teeth showing false pocketing. Genetic mutations of cathepsin C gene (CTSC) in the region of chromosome 11q14-21 is considered as cause of PLS but still it cannot be explained why its mutations cause hyperkeratosis of skin and severe destructive periodontitis(8-10) in our all cases gene mutation was not examined as patients belonged from a no affording family. In scientific literature Consanguinity is considered as other contributing risk factor(4) but can be contributing risk factor in our 3rd case. Another syndrome Haim-Munk syndrome which was included in our differential diagnosis has features such as arachnodactyly and acroosteolysis while these features are absent in Papillon Lefevre syndrome (7). Hart et al.1 reported in a Jewish immigrant family Cochin, India that HMS and PLS are allelic variants. Mutation in cathepsin C gene (CTSC) cause PLS. In HMS and PLS periodontitis is caused by mutation in Cathepsis C gene in junctional epithelium of gingiva and its mutation in palms and soles cause palmoplantar keratoderma (11). Our second differential diagnosis was Hypophosphatasia which has clinical features of knock-knee, bowing of femur and tibia and enlarged wrists, hypoplastic teeth with pre mature shedding ,increased amounts of phosphoethanolamine in the urine is a diagnostic feature(8). PLS is diagnosed on the basis of investigations such as hematological, hormone assay, urine Analysis, alkaline phosphatase, conventional polymerase chain reaction for microbiological analysis and radiological investigations such as orthopantomograph, periapical radiographs and cephalogram (12) but in our cases it was identified by correlation of history, clinical presentation and radiographic examination. Initially palliative treatment is given to the patients. For treatment of skin lesions and periodontitis orally retinoid are given. Prophylactically antibiotics are given with the early extraction of teeth having grade 2 and 3 mobility to prevent further bone loss which improves the retention of the denture (4). Periodontal treatment can only help us to delay the loss of teeth but it cannot completely stop it (13). If patient is reported early then full mouth periodontal flap surgery can be done to control aggressive periodontitis(14) in our cases no such treatment was suitable. After extraction of teeth having grade 2 and 3 mobility removable partial denture can be given (15, 16). Implant can be considered as an option in patients suffering from PLS but availability of bone limits its use and lack of stability makes it less considerable. Its stability can be increased by increasing number of implants in jaws or by doing pre prosthetic surgery (8). If the growth of the patient is not stopped then implant will get ankylosed so it is not advised in young patients. Stability and retention of the complete denture will be compromised if there is excessive bone loss and for implant placement other surgical techniques will be needed such as distraction osteogenesis, bone augmentation procedures, and nerve lateralization (8). Conventional tooth supported over denture can be another option (9) but in our case abutments were not suitable for over denture. Complete denture in upper arch and implant supported lower denture can be used to solve the problem of compromised retention in lower denture(17) but in our 1st and 3rd case removable partial denture and complete denture in 2nd case was advised considering the need and affordability of the patient. Osseo integrated implants can be used as fixed restoration provided if the bone level is not extremely low (18, 19). Implant retained over denture can be considered as a treatment option. Removable complete denture is mostly given in such patients because of excessively resorbed bone and satisfy the functional and cosmetic need of the patient(20) in our 3rd case we also recommended removable complete denture. Patient was kept on follow up to assess the need to re fabricate or reline the denture as bone keeps on resorbing(20) In our cases patients were young and have low socio economic status. So

extraction of the teeth having grade 3 mobility and fabrication of removable partial denture for our 1st and 3rd case and removable complete denture for our 2nd case was advised. Twice brushing and use of mouthwash to maintain oral hygiene was recommended. It is very important to coordinate with a dermatologist to manage the treatment of hyperkeratosis of skin and dermatologist should refer such patients to a dentist to deal with dental problems (21) Early diagnosis and management with the timely extraction of teeth having grade 3 mobility with prophylactically use of antibiotics can prevent the excessive bone loss and for periodontitis orally retinoid can be given unfortunately we can only delay tooth loss but it cannot be totally stopped but at least treatment options increase and functional and cosmetic needs will be better full filled.

CONCLUSION:

A rare autosomal recessive disease PLS creates functional, esthetic and psychological problems for patients. Its timely diagnosis and management with the early extraction of teeth having grade 3 mobility with prophylactically use of antibiotics can prevent the excessive bone loss and for periodontitis orally retinoid can be given. By correct identification of disease (PLS) hyperkeratotic thickening of skin of palms and soles can be managed by dermatologist.

SUMMARY:

A rare autosomal recessive disease Papillon lefevre syndrome (PLS) has many etiological factors. It is mostly presented with early loss of permanent and primary teeth, hyperkeratosis of hands and feet and aggressive periodontitis and all these features were present in our patients. Our cases have esthetic and functional concerns. Diagnosis was papillon lefevre syndrome which was based on clinical and radiographic findings. Treatment requires a multi-disciplinary approach extraction of the teeth with grade 3 mobility was advised in all these cases and they were recalled after 3 weeks of healing for impression taking to form removable partial denture for our 1st and 3rd case and removable complete denture for our 2nd case who is 24 years old male patient. Maintenance of oral hygiene by brushing twice daily and use of mouth wash was recommended and for hyperkeratotic skin patients were referred to a competent dermatologist. The patient agreed to the treatment plan except the 20 years old female refused to get any treatment. Her lower teeth were fixed by a quack using self-cure material. Early diagnosis and management with the timely extraction of teeth having grade 3 mobility with prophylactically use of antibiotics can prevent the excessive bone loss and for periodontitis orally retinoid can be given unfortunately we can only delay tooth loss but it cannot be totally stopped but at least treatment options increase and functional and cosmetic needs will be better full filled. By correct identification of disease (PLS) hyperkeratotic thickening of skin of palms and Soles can be managed by dermatologist.

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