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Dentist Approach and Oral Hygiene Guidance in Lipoid Proteinosis Patients: A Case Report

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ABSTRACT: Lipoid Proteinosis is a rare autosomal recessive disease characterized by abnormal accumulation of amorphous hyaline material in various tissues of the body including the skin, larynx, oral cavity, internal organs and central nervous system. This disease is more common in regions where consanguineous marriages are common. Lipoid proteinosis is caused by mutations in the extracellular matrix protein 1 (ECM1) gene located on chromosome 1q21. Its histopathological feature is the deposition of pale, eosinophilic, PAS (+), hyaline-looking material in the papillary dermis, dermoepidermal junction, around dermal blood vessels and skin appendages, mucosa and internal organs. One of the first findings of the disease begins with dysphonia due to the involvement of the vocal cords in early childhood. The skin is easily damaged by minor trauma or injury and permanent scars are formed. White or yellow infiltrates develop on the lips, oral mucosa, tonsils, uvula, epiglottis and frenulum of the tongue. In this case report, systemic and oral manifestations of Lipoid Proteinosis disease were examined and the clinical findings and dental treatments of a 12-year-old male patient were evaluated.

KEYWORDS: Urbach-Wiethe disease, lingual frenulum, dysphonia, oral hygiene.

INTRODUCTION

Lipoid proteinosis (LP) was first described in 1929. It is a rare autosomal recessive disease characterized by abnormal accumulation of amorphous hyaline material in various tissues of the body including the skin, larynx, oral cavity, internal organs and central nervous system (1-2). Abnormal accumulation of amorphous hyaline material causes a wide range of clinical presentations. Fewer than 500 cases have been reported in the medical literature worldwide to date. LP disease is also reported as cutaneous-mucosal hyalinosis or Urbach-Wiethe disease (1,3). LP has been reported to result from mutations in the extracellular matrix protein 1 (ECM1) gene located on chromosome 1q21. Although the exact function of the ECM1 gene is unknown, it has been reported to have important biological and physiological effects in binding proteoglycans and dermal collagens, epidermal differentiation and regulation of angiogenesis (2). Histologically, it has been reported that the amorphous hyaline material accumulated in the dermal-epidermal junction and papillary dermis is periodic acid schiff (PAS) positive and diastase resistant (4). The diagnosis of the disease is based on clinical findings and confirmed by histopathology (5). The incidence of this disease has been reported to be equal in women and men. Although LP has been seen worldwide, it has been reported to be more common in the Namaqualand region of South Africa (6).

Symptoms may differ in LP patients. One of the first findings of the disease begins with dysphonia due to the effect of the vocal cords in early childhood. It has been reported that lesions and scars are observed on the skin, usually on the face and distal parts of the extremities. It has been reported that the skin can be damaged very quickly as a result of minor trauma or injury, and permanent scars form. White or yellow infiltrates have been reported to develop on the lips, oral mucosa, epiglottis, tonsils, uvula and frenulum of the tongue (5). There is no effective treatment option for lipoid proteinosis. In some cases, dimethylsulfoxide, etretinate, chemical peeling, dermabrasion, blepharoplasty, microlaryngoscopy and vocal cord dissection have been reported (7).

In this case report, the clinical findings of an individual with Lipoid Proteinosis were discussed; the systemic and especially oral findings of the disease were evaluated, emphasizing the importance of the diagnosis, treatment and patient management processes in terms of dentistry.

CASE REPORT

A 12-year-old male patient applied to Harran University, Faculty of Dentistry, Pedodontics Clinic due to oral and dental problems. In the anamnesis, it was learned that the patient had Lipoid Proteinosis disease. In addition, it was stated that the patient's mother and father were consanguineous and had affected relatives. In the clinical examination, hoarseness was observed in the patient. The

presence of numerous beaded papules on the eyelid margins (moniliform blepharososis) and thickened skin with a waxy appearance due to the accumulation of amorphous hyaline substance in the skin were observed (Figure 1a,b). In the intraoral examination, the patient was observed to have a cobblestone appearance in the oral mucosa, irregularly thickened lips, yellow lip nodules, gingival hypertrophy, thickening and hardness of the tongue, and cracks around the mouth (Figure 2a,b,c,d). In the radiographic examination of the patient, it was determined that teeth 25, 35 and 45 were missing (Figure 3).

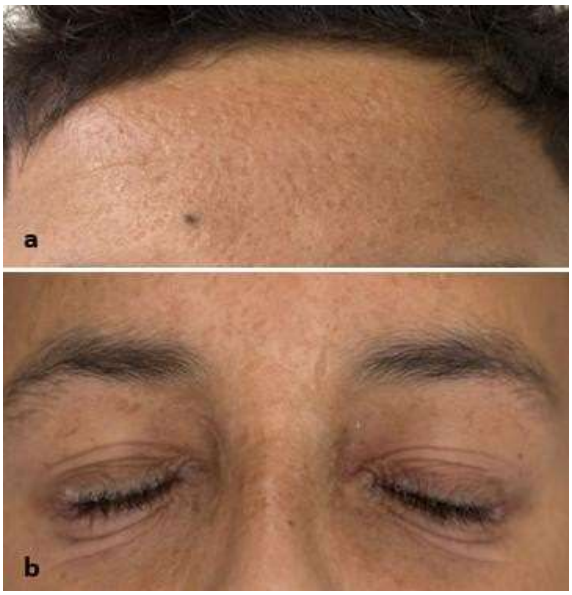

Figure 1a,b.

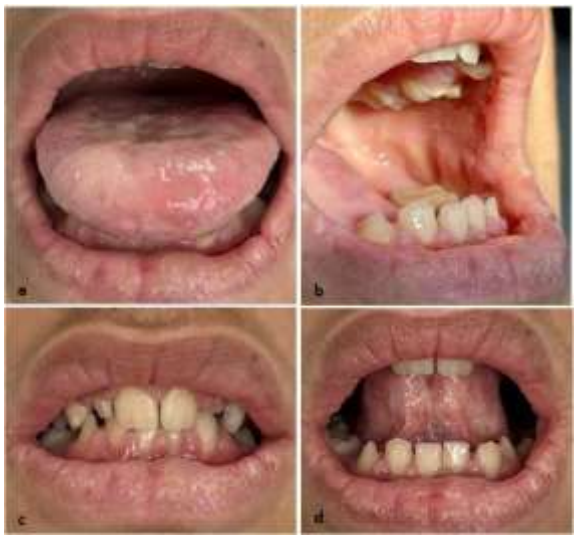

Figure 2a,b,c,d. Intraoral view of the patient

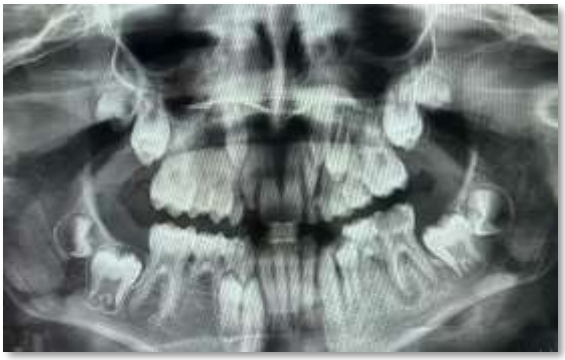

Figure 3. Panoramic radiography view of the patient before treatment

In the clinical examination of the patient, it was determined that tooth number 36 was devitalized and there was a large radiolucent lesion on the radiograph (Figure 3). An indication for root canal treatment was given to the relevant tooth. Since there were wounds and cracks around the patient's mouth, the area around the mouth was moistened with moisturizing cream before the treatment. During the treatment, an atraumatic approach was used as much as possible to prevent trauma to the patient due to the instruments used in the mouth and to prevent painful intraoral lesions from developing as a result. Without local anesthesia, after opening the access cavity, the working length was determined with an electronic apex finder (Woodpex, China). The canals were shaped with ProTaper files numbered F1, F2, F3 using a rotary file system (Dentsply Sirona X-Smart Plus, Bensheim, Germany) and irrigated with 2.5% sodium hypochlorite. Finally, they were washed with 2 ml of distilled water. After drying the root canal with sterile paper points, calcium hydroxide was placed in the root canal, a small piece of cotton was placed in the pulp chamber, and the access cavity was closed with temporary filling material (Cavit, 3M ESPE, Germany). The patient was called for a return appointment three weeks later. Calcium hydroxide was removed from the root canal. Since the involved tooth was asymptomatic, the final irrigation of the root canal was performed with 2 ml of 2.5% NaOCl and then rinsed with 5 ml of distilled water. After drying the canals with sterile paper points, the root canals were filled with angled gutta- percha (F1, F2, F3; Dentsply Sirona, Ballaigues, Switzerland) compatible with rotary instruments and root canal sealer (AH Plus, Dentsply Sirona, Konstanz, Germany) using the lateral condensation technique. The access cavity was restored with composite resin (Filtek Universal, 3M ESPE, St. Paul, MN, USA) and the treatment was completed.

The patient was given oral hygiene training. In these patients, due to the accumulation of amorphous tissue on the lips and oral mucosa, the patient was advised to do oral exercises before the treatment so that the doctor could work more comfortably and the patient would feel less pain. One hour before the treatment, it was recommended that the patient apply moisturizer around the lips and open and close the mouth 10 times and repeat this for 3-5 cycles. It was reported that a check-up should be done by the dentist every 3 to 6 months. It was explained to the patient and the parent that recurrent salivary gland inflammation in individuals with LP causes hyposalivation/xerostomia, leading to poor oral hygiene and tooth decay, and therefore, a program of non-causing sugar-free foods should be started at an early age to prevent tooth decay. It was explained that the teeth should be brushed with soft-bristled toothbrushes after every meal, and that in cases where they are not brushed, the mouth should be rinsed with water or food residues should be removed from the tooth surfaces with a clean cloth.

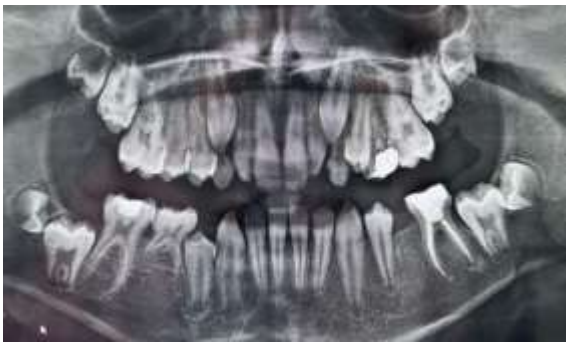

Figure 4. Panoramic radiography view of the patient at 1 year post-treatment follow-up

The patient could not attend follow-up appointments because he was out of town. In the radiographic and clinical examination of the patient performed at the 1-year follow-up session after treatment, it was determined that there was healing potential in the periapical region of tooth number 36 and no symptoms were observed in the tooth (Figure 4).

DISCUSSION

LP disease was described in 1929 by Urbach and Wiethe, a Viennese dermatologist and otolaryngologist, initially using the term ‘lipoidosis cutis et mucosae’ (8). The disease has also been alternatively reported as Hyalinosis cutis et mucosae or Urbach-Wiethe disease (9). LP has been reported to be characterized by a chromosome 1q21 defect located on the extracellular matrix protein gene 1. LP is a rare, autosomal recessive genodermatosis (10). The etiopathogenesis of LP is not yet fully understood, but it has been reported to be associated with an alteration in collagen synthesis and metabolism. This has been reported to lead to an increase in the synthesis of type IV and V collagen by the endothelial cells of blood vessels, a glycoprotein substance by fibroblasts, and a decrease in the production of type I and III collagen

(11). Its histopathological feature is the deposition of pale, eosinophilic, PAS (+), hyaline-looking material in the dermoepidermal junction, around dermal blood vessels and skin appendages, in the papillary dermis, mucosae and internal organs (12). In the light of the literature we reviewed, it was determined that our case was LP.

This disease is more common in regions where consanguineous marriages are common (13). In our study, it was determined that there was consanguinity between the patient's parents. It was determined that our case diagnosed with LP was a third-degree relative.

In the case of LP, one of the first clinical symptoms is a hoarse voice or a cry due to the involvement of the vocal cords. This condition usually manifests itself within the first year of life or shortly after birth (8). Most of the mucocutaneous symptoms usually appear within the first two years of life. Blisters, waxy papules, vesicles, acne-like scars and progressive thickening of the skin and oral mucosa are observed on the skin. One of the distinguishing features of the disease is moniliform blepharosis, which manifests itself with papules that look like beads arranged at the eyelash level. In some patients, systemic symptoms such as alopecia, nail deformities, characteristic intracerebral calcifications, epileptic seizures, cognitive decline, insulin resistance and pulmonary findings are also reported (14- 15).

Lipoid proteinosis usually affects the oral cavity significantly. Widely distributed whitish plaques and pea-sized ulcerative lesions can be observed in many tissues in the mouth. These ulcers usually appear before puberty and increase in size over time. The tongue is usually enlarged, hardened, and may have a woody consistency. Gingival hypertrophy is usually present with irregularly thickened lips. Infiltration of the lingual frenulum may cause loss of flexibility and shortening of the tongue, which affects tongue movement. The parotid and submandibular glands are usually affected in this disease, and frequent involvement of the salivary glands may lead to hyposalivation or xerostomia, leading to poor oral hygiene. Dental anomalies such as tooth agenesis, microdontia, hypoplasia, or aplasia have also been reported (10,11,16,17).

In the study conducted by Omidsalar et al., it was reported that a female patient diagnosed with LP had various findings such as hoarseness, hyperkeratosis in the elbows and hands, and numerous papules on the fingers during general examination. In oral and maxillofacial examination, limitations in mouth opening (maximum incisor mouth opening 30 mm), hard, fibrotic, dry mucosa and numerous papules on the tongue, and a dried and papilla-less tongue have been reported (16). In the study conducted by Lee et al., it was determined that fine, bead-like deposits were seen along the edges of the eyelids of a 10-year-old girl diagnosed with LP, suggesting moniliform blepharososis. It was reported that the upper and lower lips were cracked, protruding, and thickened at the commissures, and the tongue and buccal mucosa had a pale and hardened texture. There was loss of dorsal papillae on the tongue, and a thickened sublingual frenulum was reported. The patient was found to have congenitally missing teeth and microdontic permanent maxillary premolars (18). Similar findings were seen in the case of our study.

Frenkel et al. conducted a comprehensive study of oral symptoms in LP patients and analyzed 133 cases between 1948 and 2016. Frenkel et al. determined that the lingual region (68%), floor of mouth (55.8%), lips (43%), buccal mucosa (40%), palate (25%) and gingiva (5.8%) were among the most frequently affected areas (19). According to the findings stated by Frenkel et al. in the intraoral examination of our case; It was observed that there was a cobblestone appearance in the oral mucosa, irregular thickened lips, yellow lip nodules, gingival hypertrophy, tooth deficiency, thickening-hardness of the tongue, and cracks around the mouth.

Diseases with accumulation in the skin include erythropoietic protoporphyria, leprosy, papular mucinosis, amyloidosis and cutaneous xanthomatosis, and these entities should be considered in the differential diagnosis. However, deepening of the voice accompanying cutaneous lesions is considered a specific finding only for lipoid proteinosis and carries pathognomonic value (12).

The prognosis of the disease is generally good and is reported to be non-life threatening. However, involvement of regions that may cause respiratory difficulties such as the larynx, pharynx, tongue, soft palate and tonsils has been reported to lead to upper respiratory tract infections and even serious complications requiring tracheostomy. There is no clear treatment option for the disease. Cases have been reported to respond to oral dimethyl sulfoxide or etretinate treatment. In cases of vocal cord involvement, mucosal peeling, excision of macroscopically visible mucosal infiltrates or CO2 laser may provide temporary improvement. Blepharoplasty, dermabrasion and chemical peeling have been reported as other possible treatment options (20). In such patients, dental treatments are a difficult process for the physician and the patient due to the accumulation of amorphous tissue in the lips and oral mucosa and the tendency of the mucosa to irritation.

Gingivectomy treatment has been reported to be an effective treatment option to reduce periodontal pocket formation and facilitate dental care (18). Since the planned treatments required utmost care, the necessary gingival treatments were performed by expert periodontologists to remove dental plaque and tartar.

CONCLUSION

Since LP often affects the oral cavity and manifests itself with oral findings before cutaneous lesions, it is of great importance for dentists to have knowledge and skills regarding the oral symptoms of the disease and to increase their awareness. Early detection of LP by the dentist, correct diagnosis, treatments to be performed by the dentist, early interventions such as oral hygiene training and preventive practices contribute to increasing the patient's life comfort. Therefore, it was thought that future studies on LP would be more useful in order to increase awareness and the knowledge and experience of dentists.

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