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Full mouth implants rehabilitation of a patient with ectodermal dysplasia after 3-Ds ridge augmentation. A clinical report

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ABSTRACT

A 22-year-old female presented with hypodontia and severe atrophy of alveolar ridge associated with ectodermal dysplasia, was treated with 3Ds bone augmentation technique and full mouth implants rehabilitation. Bone blocks harvested from the retro molar area to construct adequate bone volume at posterior maxilla and mandible. The vertical and horizontal bone augmentation allowed proper implant placement according to prosthetically-driven implant placement concept. Ten implants were placed. Six in the maxilla and four implants were inserted in the mandible. A cement-retained full mouth metal ceramic FPDs were fabricated. The outcome of the treatment showed that dental implants placed in bone block grafts should be considered as a good treatment modality for patients with ectodermal dysplasia. It also, provided the patient with a prosthesis that enhanced the patient function and esthetics.

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1. Introduction

Ectodermal dysplasia (ED) comprises a large heterogeneous group of inherited disorders that are characterized by primary defects during the development of two or more tissues that are derived from embryonic ectoderm. The tissues primarily involved are the skin, hair, nails sweat glands and teeth [1].

Oral findings often are important and can include multiple abnormalities of the dentition (such as Anodontia, hypodontia, or malformed peg like teeth), loss of occlusal vertical dimension, and protuberant lips. Also, patients with ED, because of tooth absence, have hypoplastic alveolar bone with

knife-edge morphology result in bite collapse, making implant reconstruction a challenge [2–4].

Advanced alveolar bone loss (>7 mm) may result in esthetically and functionally compromised dental prosthesis like removable and fixed partial dentures and ideal implant placement in prosthetically driven position [5]. The end goal of the therapy is to provide a functional restoration that is in harmony with the adjacent natural dentition. Thus augmentation of bone is often necessary [6]. Advances in biologic understanding of different bone regenerating materials and continuous innovations in surgical techniques have led to increased predictability in reconstruction of alveolar ridge defects and functional implant placement [7].

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Augmentation of insufficient bone volume can be brought about by different methods, including, particulate and block grafting materials, Guided Bone Regeneration with or without growth and differentiation factors, ridge splitting, expansion and distraction osteogenesis, either alone or in combination. These techniques may be used for horizontal/vertical ridge augmentation, socket preservation and sinus augmentation [6].

In an alveolar ridge with insufficient height or width to accommodate an implant with the desired dimensions, a two-stage procedure is indicated. These three-dimensional crestal defects showed unpredictable results when reconstructed with bone substitutes. Hence, reconstruction of large defects requires horizontal and/or vertical augmentation of autogenous bone grafts [8,9]. Therefore, particulate autogenous bone or autogenous bone blocks in combination with resorbable or non-resorbable membranes can be used [10]. Alternatively, a vertical augmentation can be done in combination with distraction osteogenesis, sandwich or interpositional techniques [11]. However, additional bone grafting at the time of the re-entry may be needed [12–14].

2. Case presentation

A healthy 22-year-old female dental student was presented seeking prosthetic rehabilitation. On clinical intraoral examination, the patient has suffered from ectodermal dysplasia ED that is manifested by hypodontia (only two centrals, two laterals with small roots and two stunted molar in the maxilla and six anterior teeth, one loose left premolar and two stunted molars in the mandible) and severe alveolar atrophy in the posterior ridges. The patient lived all her life on soft food. Deposits, gingival inflammation and yellowish stains were also detected around all remaining teeth. Moderate class III maxilla–mandibular relation was evident. Severe ridge atrophy in both maxilla and mandible was obvious (Fig. 1).

Extra oral examination revealed good normal conditions of hair, eye lashes, eye brow, nails and skin. Also, she has sunken upper lip and cheeks and protuberant lower lip. A speech defect of some letters was noticed (Figs. 2 and 3).



Fig. 1 – The teeth present with severe deposits and bad oral hygiene. It also shows class III maxillo–mandibular relation.

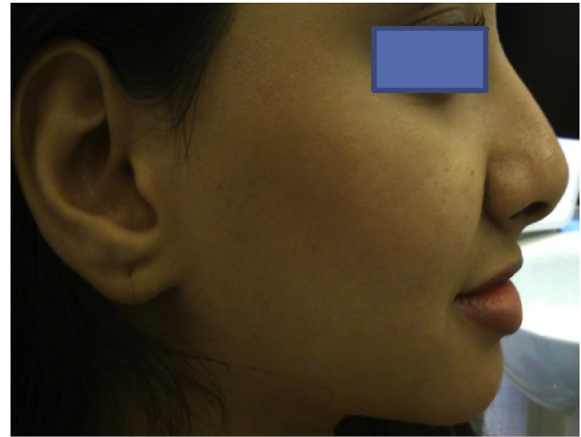


Fig. 2 – Side view of the patient showing sunken upper lip.

Questioning the family's history, it was found that an older brother to the patient (23 years old) is free from any manifestation while a younger brother (17 years old) have the same manifestation of ED as his sister. However, he has more remaining teeth in his mouth. No family history of ED could be detected in any member of the family both in the father or mother sides.

Radiographic evaluation with Cone Beam Cross Sectional Tomography (CBCT) revealed that the ridges in both the maxilla and mandible were so atrophied horizontally and vertically with a knife edge ridge shape. Measurement indicated that the ridge was only 1.2 mm in the anterior maxilla and 4 mm in the premolar area of the mandible. The roots of the four mandibular incisors were almost absent. Distal caries was detected in the two mandibular canines and required root canal treatment (Figs. 4 and 5).

3. Setting the treatment plan

The treatment plan included building-up and grafting the atrophied ridges in 3Ds, applying a prosthetically-driven



Fig. 3 – Front view of the patient showing sunken upper lip, protuberant lower lip, normal eye lashes, eye brow and hair.

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