



Prosthetic Rehabilitation for a patient of Ectodermal Dysplasia with Attachment Fixation Overdenture Prosthesis: a Case Report

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ABSTRACT: Hypohidrotic ectodermal dysplasia (HED) is a rare group of disorders affecting the hair, teeth, nails and sweat glands to a variable degree. HED usually has an X-linked inheritance and affects only males severely, while female heterozygotes show only minor defects. There is a wide range of clinical presentation of HED. Missing teeth or abnormal tooth form may be the first indicator of the disorder. This case report of mild Ectodermal dysplasia exhibited oligodontia with peg shaped teeth in a hypoplastic arches, has been treated with overdenture stud attachments (Ceka preci- clix). The patient's functional and esthetic expectations were successfully met with this prosthesis.

KEYWORDS: Hypohidrotic ectodermal dysplasia (HED), oligodontia, Overdenture, Ceka Preci –clix attachment

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I. INTRODUCTION

Ectodermal dysplasia represent a large and complex group of congenital diseases which were first described by Thurnam in 1848 [1]. Ectodermal dysplasia was assigned to the X chromosome in 1921 by Thadani, who later reported that carrier females could manifest signs of the condition [2]. Their incidence is relatively rare (1/100000 births) and is characterized by anomalies in the structures of Ectodermal derivatives (hair, nails, teeth, sweat and sebaceous glands, epithelium, conjunctiva, nervous system etc) [3]. Hypohidrotic Ectodermal dysplasia (HED) with an X-linked recessive inheritance (Christ-Siemens – Touraine syndrome) is most common and is caused by mutation in the ectodysplasin-A (EDA) and ectodysplasin – A receptor (EDAR) genes [4]. The classical facial features of HED include trichodysplasia (abnormal hair), abnormal dentition, onchodysplasia (abnormal nails), dyshidrosis (abnormal or absent sweat glands), orofacial characteristics include anodontia or hypodontia, hypoplastic conical (peg shaped) teeth, underdevelopment of alveolar ridges, frontal bossing, depressed nasal bridge, reduced vertical facial height and depth, hypotrichosis[3].

The characteristics associated with an Ectodermal dysplasia patient affects their esthetic, mastication, phonetics and self esteem due to their abnormal appearance, therefore prosthetic rehabilitation is essential for physiologic and psychosocial reasons [5]. The aim of this article is to present the prosthetic oral rehabilitation of an Ectodermal dysplasia patient with a tooth supported overdenture with ceka attachment. The diagnosis, treatment plan, and clinical procedures for this type of denture involve thorough knowledge and demand skill. An overdenture is any removable dental prosthesis that covers and rests on one or more remaining natural teeth, the roots of natural teeth, and/or dental implants[6]

II. CASE REPORT

A 40yr old female reported to the Department of Prosthodontics for difficulty in chewing and desire for replacement of her missing teeth. (figure 1)

Medical history of patient reveals mild Ectodermal dysplasia.

Dental history of the patient reveals few teeth were present. (figure 2)

Family history reveals her grandfather; father and son had similar features.

Intra oral examination revealed Maxillary and mandibular right and left canine (peg shaped) were present. Maxillary right and left central incisor were present Mandibular right and left lateral incisor was present. Macroglossia was noted. (figure 3) Both arches were found hypotrophied. Mucosa was dry and sticky. No tori or retained roots found. Periodontal status was found to be satisfactory except tooth mobility was present with mandibular right lateral incisor.

On Extra oral examination of Patient prominent forehead and everted lips was found. Hairs were thin and fragile. Nails were found to be thick, slow growing and ridged. Dryness of skin was noted.

Prosthetic treatment modes using fixed partial dentures (FPD's), removable dentures and dental implants are the primary treatment alternatives for the clinical management of Ectodermal dysplasia patient. FPD was avoided due to minimum number of teeth remaining. Ectodermal dysplasia patients presents with severe hypodontia, underdevelopment alveolar bone, an average vertical bone resorption (annual rate of 0.1mm – 0.3mm) for an edentulous ridge, along with decline in neuromuscular function and decrease in the proprioceptive response leads to instability and failure of complete denture prosthesis. Implant placement was not suggested as the bone volume was less, cost factor, technique sensitive, time consuming and it does not restore the neuromuscular pathway (Proprioception). Alternatively a multidisciplinary approach was recommended that included Oral surgery, Periodontal therapy, Endodontic therapy, reducing crown root ratio followed by construction of an overdenture. Patient's desire was to preserve her remaining natural teeth, so it was planned to rehabilitate the condition with an Overdenture with Ceka (Preci-clix attachment) type stud attachment (resilient).

The ceka (preci-clix attachment) kit consists of three burs, insertion tool, male analogues, male post and female housing (whole female unit consist of one plastic clip which is split vertically into 4 sections & one metal housing). Plastic clip is responsible for resiliency. (figure 4)

III. PROCEDURE

Extraction of mandibular right lateral incisor was done under local anaesthesia. Root canal treatment completed on the remaining maxillary and mandibular canines, maxillary central incisors and mandibular left lateral incisor. Maxillary and mandibular canines of both sides are selected to receive Preci-clix attachment post. Preparation of the root canal was done by using

- I. Pre-drilling bur
- II. Diamond bur was used to prepare the base of the PRECI-CLIX post.
- III. Reamer was used to prepare for the diameter of the post. (Figure 5)

Composite resin was used to cement the PRECI-CLIX post. Metal copings were fabricated on maxillary central incisors both sides and mandibular left lateral incisors (figure 6). Plastic clip (yellow) of the female unit were inserted into the female housing by insertion tool. The whole Female part was placed over the male part . Final impression was taken by regular body addition silicone (figure 7a, 7b). Male analogue placed into female unit of the final impression. Cast was poured, Female unit was taken out from impression and placed over the analogue on the cast. Rest of the procedure was same as construction of conventional complete denture. Preparation of upper and lower occlusal rims were done. Face bow transfer and mounting of maxillary cast to semiadjustable articulator was accomplished Vertical and horizontal jaw relations were taken mandibular cast was mounted in semi adjustable articulator. Arrangement of teeth and Try-in was completed (figure 8). Processing the prosthesis done with heat cure acrylic resin. (Fig. 9a, 9b)



Figure 1 Preoperative extraoral view

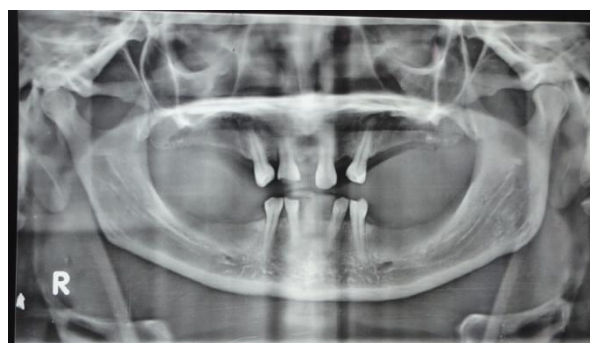


Figure 2 Preoperative OPG showing oligodontia



Figure 3. Preoperative intraoral view



Figure 4. Preci-clix instrument kit



Figure 5. Schematic view of tooth preparation and Placement of Ceka attachment



Figure 6. Intraoral view of copings and Ceka Attachments in maxillary and mandibular arch



Figure 7a Final impression maxillary



Figure 7b Final impression mandibular



Figure 8 Teeth arrangement



Figure 9a Intaglio surface mandibular denture
Denture with female clips



Figure 9b Intaglio surface maxillary
with female clips



Figure 10 Postoperative intraoral view with
Finished overdenture prosthesis



Figure 11 Postoperative extraoral
frontal view of patient's smile

IV. DISCUSSION

Fixed partial Dentures are seldom used in Ectodermal Dysplasia patients due to few number of teeth and rigid FPD's could interfere with jaw growth of young patients [7,8]. Complete dentures are avoided due to instability and retention from hypoplastic alveolar ridges and Xerostomia, [7] whereas implants were neglected due to less bone volume available and treatment was costly. When there are teeth present for support, overdenture is a desirable treatment option for these patients[9].

Teeth supported overdenture preserve alveolar bone which improves stress distribution, retention and stability, vertical dimension and proprioception are also maintained. It has psychological benefits as various retained roots/teeth will help the patient to experience a sense of security and a feeling of natural teeth. The patient is much more comfortable than complete denture wearer[10].

Retention can be augmented by various attachments anchored to the available teeth, in this case Ceka (Preci-clix) attachment was used, which can be placed by the dentist in one single appointment. The attachment audibly clicks to place to provide patient security. The male post is incorporated in the root and the female clip in the denture.

PDL receptors contain information about the magnitude and direction of occlusal forces as well as about the size and consistency of food bolus. Canines were the most sensitive of all oral structures. Kruger et al said that canines were more richly represented neurons than any other teeth therefore; sensitivity of anterior teeth to axial load was 10 times greater than posteriors[11]. Patient with natural dentition can discriminate differences at 2mm range objects between their occlusal surfaces, than patients with complete dentures. PDL receptors have a functional individuality and that the relationship of the tooth to its PDL is highly important from a sensory standpoint. So teeth should be retained for use with an overdenture to preserve the directional sensitivity[12].

In natural teeth the proprioceptive input from the PDL receptors is so discrete that excessive occlusal loads probably signal the muscles to contract causing fewer traumas to periodontium whereas, mucosal receptors under conventional dentures cannot differentiate higher occlusal loading and consequently are unable to warn against occlusal overloading leading to alveolar resorption. Average Vertical bone loss in anterior mandibular region within 5 yrs for overdenture is 0.6mm whereas conventional denture is 5.2mm[13].

V. CONCLUSION

Patient using complete dentures for prolonged period of time with frustrations due to its inertness and lack of retention will definitely find a new life with a tooth supported overdenture. Tooth supported overdenture fulfills the cherished desire of the patient, providing a retentive, stable and natural feeling of occlusal loading while in function.

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