Prosthodontic rehabilitation of a patient with ectodermal dysplasia: A case report

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ABSTRACT

Ectodermal dysplasia is a rare group of inherited disorders characterized by aplasia or dysplasia of tissues of ectodermal origin such as hair, nails, teeth and skin. The dental characteristics of this syndrome include anodontia or hypodontia of the primary and/or permanent teeth, hypoplastic conical teeth and underdevelopment of the alveolar ridges. The options for a definitive treatment plan include fixed, removable or implant-supported prostheses, singly or in combination.

This clinical report describes the diagnosis and dental treatment of ectodermal dysplasia in a 13 years old male patient. The treatment included interim removable partial denture with esthetic direct retainer fabricated to establish an acceptable therapeutic occlusal vertical dimension, which can be followed by definitive treatment after few years.

Introduction

Ectodermal dysplasia is a large, heterogeneous group of inherited disorder that is characterised by primary defects in the development of two or more tissues derived from the embryonic ectoderm. Orofacial manifestations include frontal bossing, depressed nasal bridge, protuberant lips and hypotrichosis. The dental characteristics of this syndrome include anodontia or hypodontia of the primary and/or permanent teeth, hypoplastic conical teeth, and underdevelopment of the alveolar ridges.[1,2] This clinical report describes the fabrication of maxillary interim removable partial denture (RPD) with ceramic esthetic clasps and mandibular complete denture for an adolescent patient with ectodermal dysplasia.

Case Report

A 13 years old male patient reported to the Department of Prosthodontics with chief complaint of inability to masticate and unesthetic appearance. He desired replacement of his missing teeth. The patient gave history of dryness of skin and raised body temperature. Medical history was non-contributory. Family history revealed similar findings in his 18 years old brother. Extraoral examination revealed sparse hair, frontal bossing, depressed nasal bridge, protuberant lips and decreased lower facial height. Nails appeared normal.

Intraoral examination revealed cone shaped UR1, UR2 and UL3 with underdeveloped edentulous mandibular alveolar ridge (Figure 1). Panoramic radiograph showed presence of UR1, UR2 and UL3 with complete root formation and there was no evidence of any impacted tooth (Figure 2).Clinical findings, and family history suggested a diagnosis of hypohydrotic ectodermal dysplasia.[3-5]

Figure1. Intraoral view showing cone shaped UR1, UR2 and UL3 with underdeveloped mandibular edentulous alveolar ridge

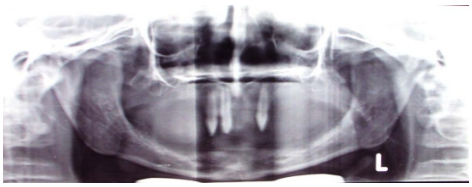

Figure 2. Panoramic radiograph showing presence of UR1, UR2 and UL3

Growth spurts from hand-wrist radiograph (Figure 3) suggested that no definitive prosthesis could be planned for another 5 years. Maxillary interim RPD with ceramic esthetic clasps and mandibular complete denture were planned to provide immediate

aesthetic results, re-establish the occlusion by replacing missing teeth and allow the patient to become familiar with removable dentures before delivery of the definitive prostheses.[6]

Diagnostic impressions were made with irreversible hydrocolloid (Tropicalgin, Zhermack, Italy). Diagnostic casts were prepared with dental stone (Kalabhai, Mumbai) and mounted in a semiadjustable articulator (Teledyne Hanau, Buffalo, New York) with the use of face-bow and centric relation records. Careful evaluation of factors relative to the vertical dimension of occlusion (VDO) is essential for an appropriate treatment planning. As evidenced by deep folds in the commissures of the mouth and by the patient's thin lips, the VDO was reduced. The physiologic rest position was determined by facial measurements and interocclusal distance and then verified by phonetics, particularly sibilant sounds like s, and sh.[7] UR1, UR2 andUL3 were morphologically restored with composite resin (Filtek Z350, 3M ESPE, Seefeld, Germany) to produce 0.25-mm undercuts (Figure 4), which enabled cast half-round circumferential clasps to be used.[8]

Figure 3. Hand-wrist radiograph for growth spurt assessment

Figure 4. Composite restorations with UR1, UR2 and UL3

New diagnostic cast was obtained and surveyed to determine the most suitable path of placement and removal of the prosthesis. Guide planes were placed on proximal surfaces of teeth. The final impressions of the maxillary and mandibular arch were made with medium and light body type of rubber base impression material respectively (AFFINIS Precious, Medium body, Light body; coltene whaledent) using the border moulded custom trays (Pyrax; Pyrax polymer, Roorkee, India). Unwanted undercuts were blocked out with maxillary master cast after surveying to confirm the path of insertion and the master cast was duplicated with phosphate bonded refractory material (FlexVest, Ivoclar Vivadent, Liechtenstein). Wax patterns for retentive clasps were prepared with pattern wax on the maxillary refractory cast, casted with nickel-chrome alloy which were layered by ceramic (Design, Ivoclar Vivadent, Liechtenstein) of the same shade of composite resin used. Maxillary permanent denture base was fabricated with heat polymerising resin (DPI, Wallace Street, Mumbai) with incorporated ceramic esthetic clasp (Figure 5). Orientation jaw relation was recorded and transferred to the semiadjustable articulator (Teledyne Hanau, Buffalo, New York) with a face-bow record. Thereafter, the centric relation was recorded with the maxillary and mandibular wax occlusion rims made on permanent denture bases (Figure 6).

Centric relation record was transferred and the master casts were mounted in a semiadjustable articulator. The posterior

Figure 5. Permanent denture base with incorporated ceramic esthetic clasps

Figure 6. Jaw relation record

and anterior artificial teeth were arranged according to balanced occlusal scheme and esthetic concepts respectively. Waxing and carving was performed and try-in was done for an esthetic and functional evaluation (Figure 7). After complete evaluation, the prostheses were acrylised with heat polymerising resin (DPI, Wallace Street, Mumbai), finished and polished. After processing, the casts were remounted and the occlusion was adjusted to remove processing errors. Minor occlusal adjustments were done following insertion of maxillary RPD and mandibular complete denture in patient's mouth (Figure 8). The patient was educated proper insertion and removal of the prostheses and instructed about adequate oral hygiene. Recall was done after 24 hrs to make necessary adjustments. Future visits were scheduled for 12 months to monitor bone growth.

Figure 7. Try-in of waxed-up dentures

Figure 8. Denture placement

Discussion

The oral rehabilitation of patients presenting with congenitally missing dentition is challenging because of the need for a multidisciplinary approach. Additional considerations, such as the patient's age, stage of growth, inherent anatomic deficiencies present in conjunction with the missing teeth, soft tissue defects, existence of malformed dentition, severe diastemas and psychological status, must be considered.[9] Because of anodontia, patients with ectodermal dysplasia have reduced alveolar bone height with "knife-edge" morphology, making prosthodontic rehabilitation a challenging task. Furthermore, because of the limited tooth structure remaining, these patients require extensive restorative and prosthetic treatment to regain appropriate function, esthetics and comfort. However, financial constraints and/or other priorities may restrict patients from choosing the most desirable treatment like fixed or implant-supported prostheses, singly or in combination. The use of removable partial denture (RPD) is a reversible treatment that can significantly improve functions and esthetics without jeopardizing compromised dentitions.[10]

Summary

The present clinical report demonstrated that interim RPDs associated with direct composite restorations could be a reversible, relatively inexpensive method of treatment for ectodermal dysplasia patients with a reduced number of teeth and limited finances. For the patient described, the treatment improved esthetics, oral functions and established a more favourable plane of occlusion. The patient's social confidence also improved significantly because of the dental treatment.

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