British Journal of Medicine & Medical Research
8(9): 806-810, 2015, Article no.BJMMR.2015.509
ISSN: 2231-0614

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Full Mouth Rehabilitation in a Patient with Amelogenesis Imperfecta: Treatment for Aesthetic and Functional Improvement

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Authors' contributions

This work was carried out in collaboration between all authors. Author AH did the case, wrote the protocol and wrote the first draft of the manuscript. Author KMAAH wrote checked the manuscript and managed the literature searches. Authors KMAAH and LG assist the case. Author MKA wrote and checked the manuscript and managed the literature searches. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/BJMMR/2015/18072
Editor(s):
(1) Yoshiro Fujii, Manager of Shin Kobe Dental Clinic, Japan.
Reviewers:
(1) Anonymous, University of the Region of Chapecó, Unochapecó, Brazil.
(2) Anonymous, Jordan University of Science and Technology, Jordan.
(3) Anonymous, King Georg Es Medical University, Lucknow, India.
Complete Peer review History: http://www.sciencedomain.org/review-history.php?iid=1121&id=12&aid=9444

Case Study

Received 1st April 2015
Accepted 18th May 2015
Published 27th May 2015

ABSTRACT

Introduction: Amelogenesis imperfecta (AI) is a dental anomaly that causes defects in enamel with no evident association of systemic disease.
Presentation of Case: This clinical report describes the oral rehabilitation of a 24-year-old woman diagnosed as having hypoplastic type of amelogenesis imperfecta along with palatally positioned maxillary lateral incisors. The aim of the treatment was to eradicate dental sensitivity, to correct of maxillary anterior malocclusion, and to restore esthetics and masticatory function. The treatment included removal of maxillary lateral incisors and placement of metal-ceramic fixed bridge dentures, as well as placement of all ceramic, metal-ceramic and full metal crowns for other affected teeth.

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Discussion: Interdisciplinary approach of the management of AI is necessary. Depending on the type and severity of the disorder, esthetic and functional concerns, prosthetic management of anterior teeth, like complete crowns, porcelain laminate veneers are the best options. For many years the most predictable and durable esthetic restoration of anterior teeth has been complete crowns.

Conclusion: Porcelain bonded to metal fixed bridge partial dentures and full ceramic, porcelain bonded to metal and full metal crowns to correct the malocclusion and aesthetic problem, to eradicate sensitivity and to restore the masticatory function in this case was satisfactory.

Keywords: Amelogenesis imperfecta; oral rehabilitation; full metal crown.

1. INTRODUCTION

Amelogenesis imperfecta (AI) has been defined as a group of hereditary enamel defects with no association of systemic disease [1]. The prevalence of AI varies from 1:700 to 1:16,000, depending on the population studied and the diagnostic criteria used [2]. Generally AI affects both deciduous and permanent dentition [3]. It affects the structure and clinical appearance of the enamel of all or nearly all teeth in a more or less equal manner [4].

Although amelogenesis imperfecta has been categorized into 4 broad groups primarily based on phenotype, hypoplastic, hypocalcified, hypomaturation and combination of hypomaturation-hypoplastic, at least 15 subtypes of AI exist when phenotype and mode of inheritance are considered [5]. The clinical features distinguish the hypoplastic and hypocalcified types [6]. Hypoplastic form of AI is characterized by thin enamel with yellowish brown color, rough or smooth and glossy, square shaped crown, lack of contact between adjacent teeth, flat occlusal surfaces of the posterior teeth due to attrition, and with/without grooves and pitting [7]. In the hypocalcified forms, the enamel thickness on the newly erupted teeth closely approaches that of normal teeth, but the enamel is soft, friable, and can easily be removed from the dentin. In contrast to hypoplastic types, the hypomaturation types develop enamel of normal thickness. The hypomaturation forms differ from hypocalcification in a way that the enamel is harder, with a mottled opaque white to yellow-brown or red-brown color, and tends to chip from the underlying dentin rather than wear away [8-10].

AI patients, regardless of subtype, have similar primary clinical problems: esthetics, dental sensitivity, and loss of occlusal vertical dimensions, however the severity experienced by the patient varies with each type of AI [11].

This clinical report describes the sequenced treatment for a 24-year-old woman with hypoplastic type of AI along with palatally positioned maxillary lateral incisors.

2. CASE PRESENTATION

A 24 year-old woman had yellowish teeth since the eruption of her permanent dentition and also suffered considerable tooth sensitivity, when she presented for treatment. The patient was referred to the Department of Prosthodontic Dentistry, Universiti Sains Malaysia for evaluation and treatment. She had palatally positioned maxillary lateral incisors. Family history revealed usual occurrence of AI. A detailed medical, dental and social history did not reveal any contributory factors to her dental conditions according to her knowledge.

After thorough examination, the patient was diagnosed with hypoplastic type of amelogenesis imperfecta affecting all teeth except mandibular left 1st molar.

Before starting the treatment, all possible treatment options were described to the patient along with their advantages and disadvantages. Treatment plan was prepared and photographs and orthopantomograph were taken with the consent of the patient (Figs. 1 and 2).

Due to poor oral hygiene conditions, two phases of periodontal treatment were planned. In first phase, deep subgingival scaling with topical anesthetic and removal of supragingival calculus followed by polishing of teeth was done in two sessions two weeks apart from each. Deep pockets were managed by closed gingival curettage using local anesthetics. Then in the maintanence phase, routine scaling and polishing throughout the dental rehabilitation was instilled to provide continuous hygiene. Patient was educated about oral hygiene and brushing

method routinely to build motivation. Appropriate radiographs were secured at appropriate intervals to evaluate intrabony defects. Mobility was assessed after each periodontal session. Initially some mobility was detected in the dentition but gradually it became sound. Mandibular and maxillary arch impressions were recorded using irreversible hydrocolloid impression materials (CA 37; Cavex, Haarlem, Holland). The study models were fabricated (Saint-Gobain type-3 hard plaster, Germany) and mounted on semi-adjustable articulator (Medesy, Italy). Patient demanded fewer visits and a low cost of treatment which lead to the plan of extracting right and left maxillary lateral incisors to achieve arch alignment. Build up of dentitions was done using glass ionomer cement (GC Fuji II capsule, GC Corporation Tokyo, Japan) to eradicate the sensitivity. In the next stage, all teeth were prepared for fixed prosthesis. Working impressions were recorded using hydrophilic vinyl polysiloxane impression material (Examix NSD, Heavy body and Injection type, GC America Inc. Illinois). Temporary crowns for inter appointment visits were made using ProtempTM 4 Temporization Material (3M ESPE, Seefeld Germany). Occlusal vertical dimension (OVD) was increased by 1.5 mm to assess patient's ability to adapt to the newly established OVD. An increased occlusal crown height of 0.75 mm in both arches was designed following the recommended limits of 0.6-0.8 mm minimal thickness of metal coping [12]. Further increase in occlusal crown height was avoided as patient was comfortable with the new OVD and our aim of ideal anterior crown proportion was achieved. After spot grinding adjustments patient was fully satisfied with the new OVD. Then three units porcelain bonded to metal fixed **bridge** partial dentures (FPDs) were constructed for maxillary right canine to maxillary right central incisor and maxillary left canine to maxillary left central incisor. For mandibular right canine till mandibular left canine all ceramic crowns were constructed and cemented using adhesive resin cement (Rely X ARC, Adhesive resin cement paste 3M ESPE St. Paul USA). All premolar teeth were restored with porcelain bonded to metal crowns and all molar teeth except for lower left first molar were restored with full metal crowns due to limited interocclusal space. Crowns of maxillary central incisors were kept occluso gingivally longer in accordance to facial height. Overbite was finished within normal limits. Bite registration was recorded using vinyl polysiloxane bite registration crème (Exabite II NDS GC America, Illinois) to reestablish the occlusal height. All crowns and FPDs were fabricated using ingot that can be press-fit (IPS e.max Press, Ivoclar Vivadent) and were cemented with glass ionomer luting cement (Ketac Cem Easymix, 3M ESPE, MN, USA) (Fig. 3) with the newly adjusted OVD. Canine guidance was used for lateral excursions, while anterior guidance was shared among all the anterior teeth.

Fig. 1. Pre-treatment intraoral photographs

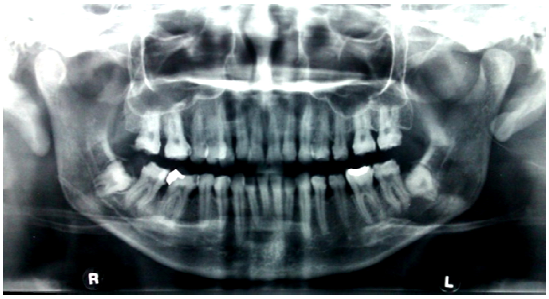

Fig. 2. Pre-treatment orthopantomograph

Fig. 3. Post-treatment intraoral photographs

Patient was recalled for the evaluation after 3 and 6 months of treatment (Fig. 4). There was no complaint of sensitivity or complications relating to the oral rehabilitation. Patient was satisfied with both functional and aesthetic point of views.

Fig. 4. Post-treatment 6 month follow-up intraoral photographs

3. DISCUSSION

Management of this case of AI along with palatally positioned maxillary lateral incisors could be done with interdisciplinary approach with the use of orthodontic correction first and then prosthetic rehabilitation which would be more time consuming and costly procedure.

Depending upon factors, like the age and socioeconomic status of the patient, the type and severity of the disorder, and the intraoral situation at the time the treatment is planned; there are different types of treatment options for AI patient [8]. However, restoration/correction of these defects is important not only because of esthetic and functional concerns, but also because it has some positive psychological impact on the patient [13]. Results of different surveys proves that patients with AI experience higher levels of social avoidance combined with a reduced perceived quality of life compared to those without AI [14].

There are a number of alternatives for the prosthetic management of anterior teeth, like complete crowns, porcelain laminate veneers etc. For many years the most predictable and durable esthetic restoration of anterior teeth has been achieved with complete crowns [15]. For posterior teeth the main aim was to restore the masticatory function with minimal tooth material destruction, for this full metallic crowns option was chosen instead of metal-ceramic crowns, as because metal-ceramic crown preparation needs more tooth material destruction in comparison to full metal crown preparation, though it's not aesthetically sound.

These options, however, requires the patient to maintain meticulous oral hygiene as caries of abutments is a leading complication of FPDs supported by the natural dentition [16]. Routine topical fluoride application for prevention of caries of abutment is of great clinical importance. Frequent dental check-ups, regular oral rinses, regular calculus removal sessions and healthy eating habits can contribute towards a long lasting prognosis [17].

4. CONCLUSION

This clinical report describes the oral rehabilitation of a 24-year-old woman affected by hypoplastic type of amelogenesis imperfecta along with palatally positioned maxillary lateral incisors with the use of porcelain bonded to metal FPDs and full ceramic, porcelain bonded to metal and full metal crowns to correct the malocclusion and aesthetic problem, to eradicate sensitivity and to restore the masticatory function. After three and six months recall there was no sensitivity or pathology associated with the rehabilitation. The patient was satisfied both esthetically and functionally about this prosthetic rehabilitation.

CONSENT

All authors declare that 'written informed consent was obtained from the patient (or other approved parties) for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editorial office/Chief Editor/Editorial Board members of this journal.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

ACKNOWLEDGEMENTS

USM short term grant 304/PPSG/61312099.

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Peer-review history:
The peer review history for this paper can be accessed here:
http://www.sciencedomain.org/review-history.php?iid=1121&id=12&aid=9444