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Multidisciplinary Approach for Restoring Function and Esthetics in a Patient with Amelogenesis Imperfecta: A Clinical Report

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Abstract: *Amelogenesis imperfecta has been defined as a group of hereditary enamel defects which may or may not be associated with some other dental and skeletal developmental defects. It can be characterized by enamel hypoplasia, hypomaturation, or hypo-calcification of the teeth. This clinical report describes the oral rehabilitation of a twenty two year old female patient with amelogenesis imperfecta complicated by periodontal problems . The specific objectives of this treatment were to enhance aesthetics, eliminate tooth sensitivity and restore masticatory function.*

Keywords: *Full mouth rehabilitation; Amelogenesis Imperfecta ;heriditary enamel defects*

I. Introduction

Amelogenesis imperfecta has been described as a complex group of inherited conditions that disturbs the developing enamel structure and exists independent of any related systemic disorder.[1,2,3,4] This anomaly affects both the primary and permanent dentition. According to Seow[5], the primary clinical problems of Amelogenesis imperfecta are unsatisfactory esthetics, dental sensitivity, and loss of occlusal vertical dimensions. However, the severity of dental problems experienced by patients varies with each type. Treatment is very crucial because amelogenesis imperfecta not only functionally handicaps the patient but also imparts a negative psychosocial impact due to the poor aesthetic appearance.[6] Treatment planning in such cases is related to many factors: the age and socio-economic status of the patient, type and severity of the disorder and intraoral situation[7]. This clinical report describes the treatment of a twenty two-year-old female patient with amelogenesis imperfecta to restore aesthetics and masticatory function.

II. Case Report

A twenty two year old female patient reported to the Department of Prosthodontics, Govt. Dental College, Trivandrum with severely yellowish discolouration of teeth. She was also experiencing difficulty in chewing because her posterior teeth were worn off . She expressed extreme dissatisfaction with her appearance (figure 1). A thorough intra oral examination revealed severely yellowish discolouration of all teeth with attrition of posteriors . A detailed medical, dental, and social history did not reveal any contraindications to dental therapy. Hard tissue examination revealed abnormally small sized teeth, generalized spacing, generalized attrition and tooth hyper sensitivity (figure 2). The oral hygiene status of the patient was moderate . On detailed periodontal examination there were periodontal pockets in relation to 11 ,12, 21, 22, 36, 46 There was no furcation involvement and grade 2 mobility was associated with 11. An orthopantomogram and intraoral periapical radiographs were taken. Clinical and radiographic examination of the patient revealed definite loss of vertical dimension.

Figure 1 : pre-operative extra oral view

Figure 2 : Preoperative – intraoral view

Diagnosis: A typical case of Amelogenesis imperfecta complicated with periodontal involvement.
Treatment planning: The following procedures were planned to be done sequentially.

1. Thorough oral prophylaxis.
2. Intentional RCT of 11 and composite restoration on 46.
3. Periodontal flap surgery in relation to maxillary and mandibular anteriors and follow up.
4. It was decided to give the patient an occlusal splint for a period of two months to assess whether the masticatory apparatus would tolerate the increase in vertical dimension.
5. If patient was comfortable with the occlusal acrylic splint, porcelain fused to metal restorations would be given on all the teeth at the new vertical dimension of occlusion.

Procedure: To start with, the entire treatment plan was explained to the patient and she was made aware of all the pros and cons of the suggested treatment plan. She was informed of the periodontal and endodontic treatment required and all other treatment alternatives. The expected cost of treatment, clinical longevity and aesthetic outcome were explained.

Preliminary impressions were taken in alginate (Zelgan) and diagnostic casts were made. The treatment involved scaling and root planing, followed by periodontal flap surgery in relation to maxillary and mandibular anteriors (figure 3). Hydroxyapatite bone graft material was placed in both the sites to promote regeneration in relation to the intrabony defects around these teeth(figure 4).

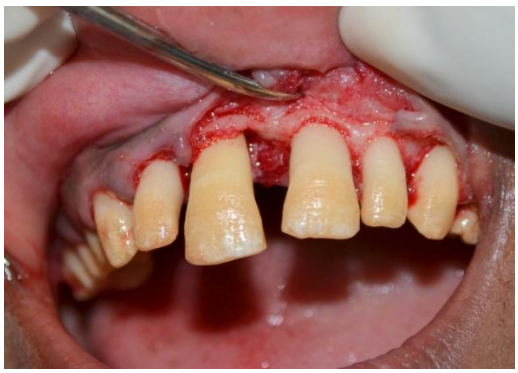

Figure 3 ; Periodontal Flap Surgery

Figure 4 : Placement of bone graft material

The probing depths in relation to 36 and 46 reduced following non-surgical therapy and so further periodontal surgery was not needed. The patient was on a regular maintenance programme and has been followed up . After three months of completion of the periodontal therapy, the prosthetic phase of the treatment has been started . She was given an occlusal splint which she wore for a time period of two months. TMJ was

examined for any tenderness or abnormal sounds. Since the patient was comfortable with the new vertical dimension , we proceeded with the prosthetic phase of the treatment.

Impressions of both arches were made in irreversible hydrocolloid (Zelgan Alginate). Diagnostic casts were made and mounted on a semi-adjustable articulator (Hanau wide vue) using a face-bow transfer(figure 5). Vertical dimension of occlusion was increased by 3mm using bite registration wax and the mandibular cast was mounted in centric relation at the increased vertical dimension using this wax bite.

1. Auto polymerized acrylic resin jig (DPI Acrylic) was made between the maxillary and mandibular anterior teeth of articulated cast after removing the wax bite . This acrylic jig was used as an index to maintain the maxillary and mandibular relationship in the new vertical dimension during the posterior teeth preparation. Every effort was taken to protect the health and integrity of periodontium during tooth preparation. Occlusal reduction was kept minimal.
2. Gingival retraction was done using non medicated gingival retraction cord (Knit trax 000) and polyvinyl siloxane impressions (Elite HD Dentsply) were made of the maxillary and mandibular arches. The posterior segmental relationship was then registered using bite registration paste (Bitrex) with the resin jig in place.
3. Provisional restorations were fabricated in tooth coloured autopolymerising acrylic resin by indirect technique and were cemented using noneugenol cement (Freegenol). Patient was recalled after a period of 2 weeks.
4. Metal copings were fabricated and tried intra-orally to check marginal fit and accuracy. A bisque trial was done for verification of the fit, contours and occlusion. The PFM crowns were then glazed and cemented using Glass ionomer luting cement.
5. The patient was instructed to take soft diet for 2 weeks. The patient reported back after two weeks and was very comfortable with the restorations and reported that she had absolutely no discomfort in chewing food.
6. Maxillary and mandibular anterior teeth were prepared and impressions were made using poly vinyl siloxane impression material(figure 6).

Figure 5 : Facebow transfer

Figure 6 : Anterior tooth preparation

Impressions were poured in type IV dental stone to obtain working casts. The metal coping trial was done followed by ceramic build up and bisque trial. Once again, after ascertaining the patients comfort levels and aesthetic satisfaction, the crowns were cemented using Glass ionomer cement (figure 7,8).

Figure 7: Post operative intraoral view

Figure 8 : Post operative extraoral view

7. The patient was explained the importance of maintaining the restored teeth. Oral hygiene instructions emphasizing the use of dental floss and proper brushing were given. Evaluations at one month interval were done and the patient did not experience tooth sensitivity or any other complication associated with the oral rehabilitation. The patient's aesthetic and functional expectations were also met.

III. Discussion

The absence of normal enamel invariably results in diminished function and compromised aesthetics in patients with Amelogenesis imperfecta[8]. These patients are associated with quantitative and qualitative enamel deficiency, pulpal calcification, taurodontism and root malformations, impaction of permanent teeth, congenitally missing teeth and open bite.[9] Many surveys have reported the importance of treating such patients not only from a functional standpoint, but also from a psychosocial standpoint.[10] One of the most demanding aspects of this case involves the development of sufficient restorative space, while simultaneously fulfilling aesthetic, occlusal, and functional parameters. According to Spear, the best vertical dimension is the one that satisfies the patient's aesthetic desires and the practitioner's functional goals with the most conservative approach.[11] Oral hygiene has to be maintained at a high level if a favourable long-term prognosis for restorative procedures is to be achieved.

IV. Conclusion

This clinical report describes prosthodontic treatment for a young patient with amelogenesis imperfecta complicated with periodontal involvement using a simple sequential approach. The treatment successfully halted the process of pathological attrition due to poor quality of the enamel. The treatment also boosted the confidence and self esteem of the patient by satisfying her aesthetic desires.

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