

## Case Report

### PROSTHODONTIC REHABILITATION OF A CASE OF AMELOGENESIS IMPERFECTA

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#### Abstract:

Amelogenesis imperfecta (AI) has been defined as a group of hereditary enamel defects which may or maynot be associated with some other dental and skeletal developmental defects. It can be characterized by enamel hypoplasia, hypomaturation, or hypocalcification of the teeth. This clinical report describes the oral rehabilitation of an eighteen year old female patient diagnosed to have amelogenesis imperfecta complicated with malocclusion. The specific objectives of this treatment were to enhance aesthetics, eliminate tooth sensitivity and restore masticatory function.

**Key-words:** Amelogenesis Imperfecta (AI), Full mouth rehabilitation;

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#### INTRODUCTION

Amelogenesis imperfecta (AI) has been described as a complex group of inherited conditions that disturbs the developing enamel structure and exist independent of any related systemic disorder.<sup>1-4</sup> This enamel anomaly affects both the primary and permanent dentition. Main clinical manifestations associated with AI patients are tooth sensitivity, unsatisfactory aesthetics and loss of vertical dimension of occlusion due to the rapid wearing of dentition.<sup>5</sup> Treatment of AI is very crucial because it not only handicaps the patient functionally but also imparts a negative psychosocial impact due to the poor aesthetic appearance.<sup>6</sup> Treatment planning for patients with AI is related to many factors: the age and socio-economic status of the patient, type and severity of the disorder and intraoral situation.<sup>7</sup>

#### CASE REPORT

An eighteen year old female patient who was previously diagnosed to have amelogenesis imperfecta reported to the

Department of Prosthodontics, Govt. Dental College, Trivandrum. Her primary concern was the severely yellowish discolouration of teeth. The discolouration was present right from the eruption of the permanent teeth and its intensity increased as time passed. She was also having difficulty in chewing since her posterior teeth were worn off and decayed. She was also unhappy with the irregular arrangement of her front teeth. (Figure 1)



**Figure 1:** Pre-operative Photograph

Dental history revealed that one of her upper front teeth (left upper canine) was extracted at the age of 13 years since it had

been buccally erupted. Family history showed that her younger sister was also suffering from similar problem. A thorough intra oral examination revealed severely yellowish discolouration of all teeth with attrition of posteriors. Teeth 13, 33 and 43 were buccally erupted and her maxillary and mandibular anterior teeth were mal-aligned. 23 was missing (H/o extraction). She was also having a mild anterior open bite. The occlusal scheme was of group function type with an end on molar relation. Teeth 16, 26, 35, 36 and 46 were severely attrited and carious. The oral hygiene was satisfactory. The patient was not willing to go for an orthodontic treatment. Preliminary impressions were taken in alginate (ALGIPLAST, INDIA PVT) and diagnostic casts were mounted on a articulator. OPG and full mouth intraoral periapical radiographs were taken. Interocclusal distance at rest was measured and was found to be 4mm.

**Diagnosis:** A typical case of Amelogenesis imperfect presented with malocclusion.

**Treatment planning:** The following procedures were planned to be done sequentially.

1. Thorough oral prophylaxis
2. It was decided to give the patient an occlusal splint of 1.5mm thickness for a period of two months to assess whether the masticatory apparatus would tolerate this increase in vertical dimension.
3. Endodontic treatment of the caries exposed 16, 26, 36 and 46 and restoration of 35
4. Intentional RCT of buccally placed 13 and 33.
5. If patient was comfortable with the occlusal splint, metal ceramic restorations would be given on all the teeth in the newly established vertical dimension of occlusion.

#### **Procedure:**

1. 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 endodontic treatment required and all other treatment alternatives. The expected cost of treatment, clinical longevity and aesthetic outcome were explained. Oral prophylaxis was completed and the patient was then educated about the importance of maintaining a good oral hygiene. She was given an occlusal splint which she wore for a time period of 2 months. TMJ was examined for any tenderness or abnormal sounds. Restorative procedures were also carried out as required. (Figure 2)



**Figure 2:** Post-endodontic radiographs.

2. Impressions of both arches were made in alginate (Zelgan Alginate). Diagnostic casts were made and mounted on a semi-adjustable articulator (Dentatus Articulator type ARH) using a face-bow transfer. Vertical dimension of the occlusion was increased by 1.5mm using a bite registration wax and the mandibular cast was mounted in centric relation at the increased vertical dimension using this wax bite.
3. Auto polymerized acrylic resin jig (DPI Acrylic) was made between the maxillary and mandibular anterior teeth of articulated casts after removing the interocclusal record.
4. This acrylic jig was used as an index to maintain the maxillary and mandibular relationship in the new vertical dimension during the preparation of

posterior teeth. Extreme effort was taken to protect the health and integrity of periodontium during tooth preparation. 14,15, 16, 24,25, 26, 34,35, 36, 44,45, 46 were prepared to receive PFM crowns. Occlusal reduction was kept minimal. (Figure 3)



**Figure 3:** Maxillary Posterior tooth preparation.

5. 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. (Figure 4) The posterior segmental relationship was then registered using bite registration paste (Bitrex) with the resin jig in place. (Figure 5)



**Figure 4:** Mandibular Posterior tooth preparation.



**Figure 5:** Bite registration

6. Provisional restorations were fabricated in tooth coloured autopolymerising acrylic resin by indirect technique and were cemented using non eugenol cement (Freegenol). Patient was recalled after a period of 2 weeks.
7. Metal copings were fabricated and tried intra-orally to check marginal fit and accuracy. A2 Shade was elected as it was found to be most suitable for the patient. A bisque trial was done for verification of the fit, contours and occlusion. The PFM crowns were then glazed and cemented using GIC luting cement.
8. She was instructed to take soft diet for 2 weeks. The patient reported back after two weeks and was very comfortable with the restorations.
9. Maxillary and mandibular anterior teeth were prepared and impressions were made using poly vinyl siloxane impression material (ELITE HD Dentsply). Impressions were poured in type IV dental stone to obtain working casts. The metal coping was tried for fit and central clearance. (Figure 6) A bisque trial was done after ceramic build up. Once again, after ascertaining the patients comfort levels and aesthetic satisfaction, the crowns were cemented using GIC cement. (Figure 7)



**Figure 6:** Anterior metal try in

10. 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 for a period of 3 months 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.



**Figure 7:** Post operative photograph

### Discussion

The absence of normal enamel invariably results in diminished occlusal function and compromised aesthetics in patients with Amelogenesis imperfecta.<sup>8</sup> Dental features associated with AI include quantitative and qualitative enamel deficiency, pulpal calcification, taurodontism and root malformations, impaction of permanent teeth, congenitally missing teeth and anterior and posterior open bite.<sup>9</sup> Many surveys have reported the importance of treating the AI patient not only from a functional standpoint, but also from a psychosocial health standpoint.<sup>10</sup> 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.<sup>11</sup> In the present case report, an acrylic jig is used to maintain the centric relation position at the desired VDO during the preparatory phase. Optimum oral hygiene has to be maintained if a favourable long-term prognosis for restorative procedures is to be achieved.

### Conclusion

The present clinical report describes prosthodontic treatment for a young adult with amelogenesis imperfecta complicated with malocclusion 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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