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Case Report

Go an extra mile for a perfect smile - A multidisciplinary approach for management of amelogenesis imperfecta

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ABSTRACT

Amelogenesis imperfecta refers to a group of rare, inherited disorders characterized by abnormal enamel formation. Patients mainly seek solution for unesthetic appearance caused by the condition. As prosthetic rehabilitation is essential for esthetics and function an interdisciplinary approach is often needed for restoration of health and its long-term maintenance. A multidisciplinary approach was mandatory for the management of this case. Short clinical crowns were present in all quadrant which made it difficult to achieve adequate retention and resistance forms for tooth replacement. In all quadrants, surgical crown lengthening was done by full thickness flap utilising a sub marginal incision with bone reduction wherever required to achieve bone level at least 3-4mm from gingival margin to facilitate supra crestal attachment (biologic width). After sufficient healing and stabilisation of gingival margins, prosthetic rehabilitation followed using fixed metal ceramic crown from molar to molar in both jaws. Depigmentation of the gingivae via conventional scalpel (upper arch) and laser (lower arch) was done to enhance the pink aesthetics. Sufficient crown length for a good resistance and retention form and adequate biologic width was established and pink white esthetic harmony was achieved.

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1. Introduction

Amelogenesis imperfecta (AI) is a wide group of inherited diseases that exhibit quantitative or qualitative tooth enamel defects in the absence of systemic manifestations.¹ Amelogenesis Imperfecta has many synonyms which include hereditary enamel dysplasia, hereditary brown enamel, Hereditary brown opalescent teeth. Etiology of AI is related to the alterations of genes involved in the process of formation and maturation of enamel. The prevalence of AI varies greatly across epidemiological reports. The average global prevalence of Amelogenesis imperfecta is <05%.² The enamel in AI is abnormally thin, soft, fragile, pitted, and/or discoloured, causing embarrassment, eating

difficulties, and pain in patients. It is also linked to poor social outcomes and poor aesthetics.³

Patients affected by AI almost always require an interdisciplinary approach to manage their condition, which is concentrated in the first two decades of life and necessitates lifelong maintenance therapy. The patients with AI often present with short clinical crowns which may complicate their prosthetic rehabilitation. In such cases for the successful restoration to happen crown lengthening will become inevitable. Thus, an interdisciplinary approach may be required from both physiologic and aesthetic standpoint.

This case report highlights an interdisciplinary approach for treating a patient with amelogenesis imperfecta.

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2. Case Report

A 20-year-old male reported in the OPD of Govt Dental College Kottayam with a presenting complaint of yellowish discoloration of teeth which he noted since the eruption of teeth. He was systemically fit and well. He complains of “Insecurity in smiling” because of this discoloration. Clinical examination revealed discoloured, mutilated and short clinical crowns with spacing in upper anteriors (Figure 1).



Fig. 1: Preoperative image

On intraoral examination, all teeth except 3rd molars in the maxillary arch were present, deep caries on 16, 26 and Angles class I molar relation with deep bite. He has not undergone any dental treatment till date. On Soft tissue examination gingiva appeared heavily pigmented and no abnormalities were detected in other soft tissues. Patient maintained good oral hygiene as gingiva appeared healthy and bleeding on probing was < 10%. He was diagnosed as having AI and it was decided for rehabilitation with ceramic crowns from first molar to first molar in upper and lower arch. Clinical crownss were short due to altered passive eruption. Bone sounding revealed the alveolar bone position close to CEJ.

2.1. Radiographic findings

Orthopantomogram was taken for assessment (Figure 2). The residual covering enamel had the same radiolucency as the underlying dentin but was thinner. Radiolucency involving enamel and dentin approaching pulp was noted in relation to 16 26 suggestive of deep caries.

2.2. Case management

The caries in relation to 16 and 26 were deep hence it was treated with root canal treatment. Removable bite plane was fabricated with an objective of achieving adequate bite opening as the patient had deep bite (Figure 3).

Maxillary and mandibular arch primary impressions were taken for stent fabrication. Acrylic stent was fabricated



Fig. 2: Panoramic view



Fig. 3: Bite plane to correct deep bite

by marking the desired portion of gingival margin on the cast. These stents act as guide for crown lengthening to score the tissue before incision and flap elevation.

Blood investigations were carried out to rule out any contraindications for surgery. The entire procedure was explained to patient and written informed consent was obtained from the patient. Surgical crown lengthening was performed in all teeth by quadrant wise approach. The level of incision was marked with the help of the prefabricated stent. Submarginal incision was placed with the help of No 15 bp blade, then crevicular incision was placed and the tissue was removed with the help of curette. Full thickness mucoperiosteal flap was elevated to facilitate osteotomy in sites with bone levels closer to CEJ. Osteotomy was performed with the help of micromotor (Figure 4). Full thickness flap was elevated in all quadrants and primary closure was achieved with 3-0 silk suture. The procedure was completed in a month by providing 7 days gap between the surgeries.



Fig. 4: Intraoperative images

The next phase of therapy included prosthetic restoration. After adequate healing of the tissues crown preparation was done in relation to posteriors and provisionalisation was done utilising acrylic crowns. From first premolar to first molar in each quadrant, posteriors were replaced with metal ceramic restorations with connected crowns. After luting the posterior crown and checking fit and occlusion, the anterior teeth were prepared. The preparation of anterior teeth was done after assessing the needed overjet, overbite and after the assessment of smile. For mandibular, canine to canine and maxillary, canines to central incisors, joined crowns were provided. After the replacement with metal ceramic restoration the patient was not satisfied with the pigmented appearance of his gingiva (Figure 5). Pink and white esthetics was not in harmony. So it was decided to proceed with depigmentation to achieve Pink White Esthetics.



Fig. 5: Prosthetic rehabilitation using metal ceramic crown

Depigmentation was performed in by utilising scalpel (bp blade 15) in the maxillary arch in the first appointment under local anesthesia (lignox). Scraping of the epithelium was done carefully and all remnants of pigmented epithelium was removed. The area was thoroughly rinsed and periodontal dressing was given to protect the raw area. In the second appointment which was scheduled after 7 days periodontal pack was removed and the area debrided. In the same day mandibular arch depigmentation was done using diode laser (Woodpecker) under topical anesthesia (lignocaine gel)(Figure 6). The laser tip after activation was used in a light brushing stroke and the tip was in constant state of motion to avoid excessive heat damage to the tissues. The operating site was continuously moistened during the entire procedure. Topical application of Vitamin E was prescribed.

2.3. Clinical outcome

Post-operative period after crown lengthening and depigmentation was uneventful. The healing was satisfactory. Depigmentation by scalpel and laser technique showed visually similar appearance one month postoperatively. (Figure 7)

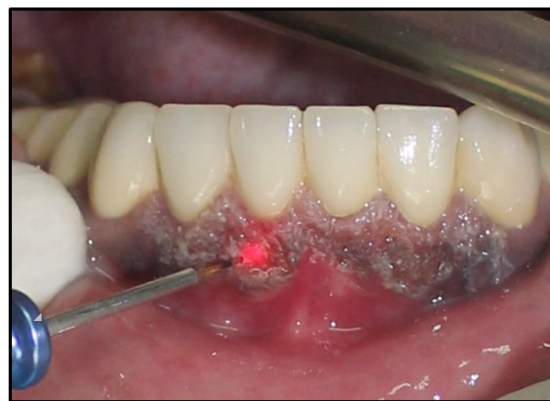


Fig. 6: Laser depigmentation



Fig. 7: Postoperative (2 week in maxilla, 1 week in mandible)



Fig. 8: Postoperative (1 year)

3. Discussion

A beautiful and visually appealing smile is no longer a fantasy. With the growing popularity of aesthetic-related treatment methods, it is critical to gain an awareness of the therapeutic synergies brought about by an interdisciplinary approach.⁴ The most prevalent complaint among those who are unhappy with their smile is that their teeth are not of optimal colour. While both small and long teeth impair

aesthetics, the width: length ratio of teeth also has an impact on the perception of smile aesthetics.⁵ In cases with amelogenesis imperfecta the chief complaint of the patients are usually discoloured teeth and unesthetic smile as a result of disparity in crown size. The rehabilitation of people with AI is a difficult task that necessitates a multidisciplinary approach.

In this case the patient reported with unesthetic yellowish discoloration of the teeth. The treatment plan was to go for full mouth rehabilitation in which case an interdisciplinary approach became mandatory as the patient was having inadequate crown height due to altered passive eruption. The crown lengthening procedure was undertaken to provide adequate crown height and also to maintain supracrestal tissue attachment within normal limits.^{6,7} Violation of the supracrestal tissue attachment will result in bone resorption, food lodgement, and, eventually, treatment failure.⁸

A healing period of 6-12 weeks is needed prior to fixed restoration in posteriors and 3-6 months for anteriors prior to permanent fixed restoration.⁹⁻¹² In this case full mouth fixed, partial denture was fabricated using metal ceramic restoration after 3 months. However, the patient was dissatisfied with his smile because his deeply pigmented gingiva did not appear to be on par with his white teeth. Depigmentation procedure was done using two different techniques utilising scalpel and diode LASER.^{13,14} Initially the maxillary segment depigmentation was done using scalpel technique and patient desired depigmentation using LASER for the mandibular arch. Scalpel technique for depigmentation is the conventional, economical and most simple depigmentation technique. However, it resulted in bleeding and required placement of periodontal pack for 7-10 days. LASER on the other hand provide a bloodless field for the procedure however it is expensive and rate of recurrence is more.¹⁴ Patient experienced less postoperative pain and discomfort after the procedure with LASER compared to scalpel technique however visually the appearance was similar for both in the 1st month of follow-up.

4. Conclusion

This case report highlights the importance of multidisciplinary approach in the management of Amelogenesis imperfecta. A comprehensive treatment plan and synchronous interdisciplinary approach helped the patient to regain his confidence by giving him a perfect smile.

5. Source of Funding

None.


6. Conflict of Interest


None.


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