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CASE REPORT

Oral Rehabilitation of an Adolescent Patient suffering from Amelogenesis Imperfecta

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ABSTRACT

Amelogenesis imperfecta (AI) is a genetic disorder that causes defective enamel development in both the primary and permanent dentitions. Significant tooth structure damage often results in various pulpal symptoms, occlusal disharmony, impaired function, and esthetic disfigurement. These problems pose great challenges to the clinician when rehabilitating patients with AI. This case report describes a way to restore esthetic and function of erupting dentition of a 14-year-old patient with amelogenesis imperfecta.

Keywords: Amelogenesis imperfecta, Esthetics, High-density polymethylmethacrylate, Vertical dimension.

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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 exists independent of any related systemic disorder.[1-3] This enamel anomaly affects both the primary and permanent dentition.[1-4] The incidence of AI has been reported to vary between approximately 1:700 and 1:16,000, depending on the population studied and the diagnostic criteria used.[4-7]

Different inheritance patterns, including autosomal dominant, autosomal recessive, and X-linked, have been suggested in the literature.[8] Although, AI has been categorized into four broad groups, based primarily on phenotype—hypoplastic, hypocalcified, hypomaturation, and hypomaturation-hypoplastic—at least 15 subtypes of AI exist when phenotype and mode of inheritance are considered.[1-4,9-11]

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According to the literature, AI patients, regardless of subtype, have similar oral complications: Teeth sensitivity, poor dental esthetics, and decreased occlusal vertical dimension.[12] Other dental anomalies associated with AI include, but are not limited to, multiple impacted teeth, congenitally missing teeth, open occlusal relationship, and taurodontism.[4,11,13]

Although the AI subtype and severity may limit potential treatment options, a published survey reported the importance of treating the AI patient not only from a functional standpoint, but from a psychosocial health standpoint as well.[12,14] Results of the survey found that patients with AI experience higher levels of social avoidance combined with a reduced perceived quality of life compared to those without AI, and that treatment has a positive psychosocial impact.[14] This clinical report describes the sequenced treatment for a young patient with AI with lack of complete eruption of teeth.

CASE REPORT

A 14-year-old male patient was referred to the Department of Prosthodontics at Sudha Rustagi College of Dental Science & Research, Faridabad, Haryana, India. A detailed medical, dental, and social history was obtained. The medical history and general physical condition was unremarkable. The family history revealed that the patient's parents were not affected by AI, although his younger brother was diagnosed with AI. The patient had not received any restorative treatment for esthetics before this consultation. The boy desired an improvement in the appearance of his anterior teeth, which were discolored, stained, and pitted (Figs 1 to 3).

He did not report any parafunctional habits. Clinical and radiographic examination of the patient revealed

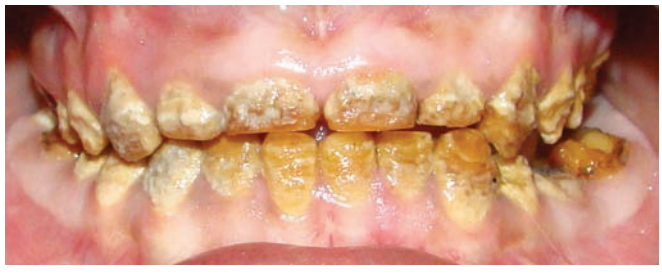

Fig. 1: Frontal view

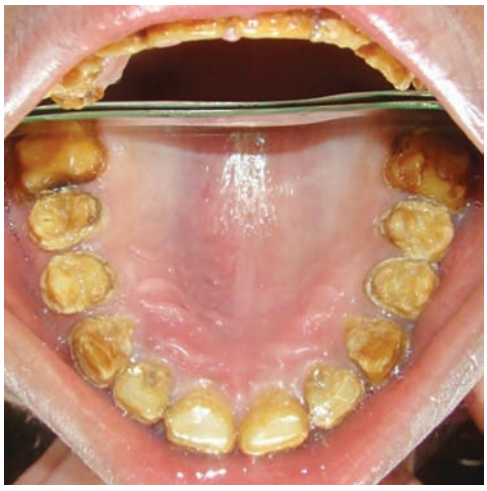

Fig. 2: Occlusal view of affected maxillary arch

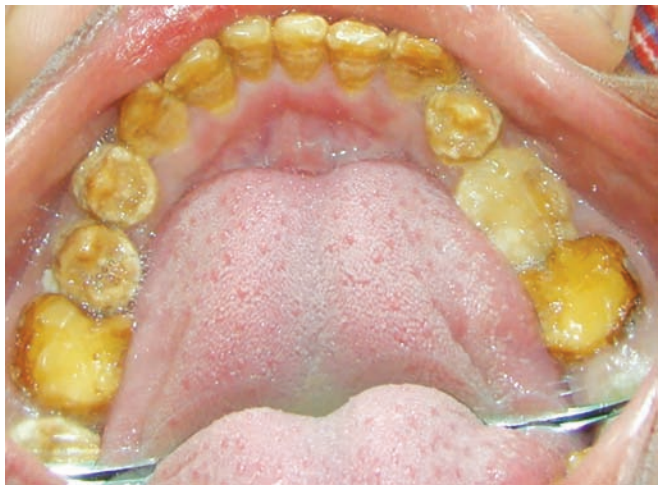

Fig. 3: Occlusal view of affected mandibular arch

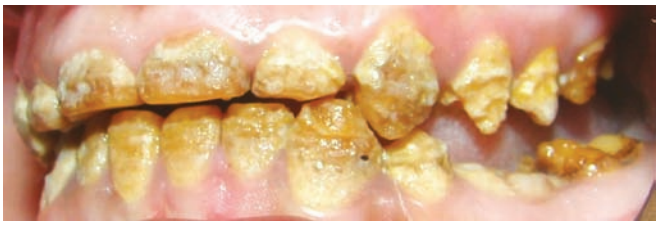

Fig. 4: Lateral view of occlusion

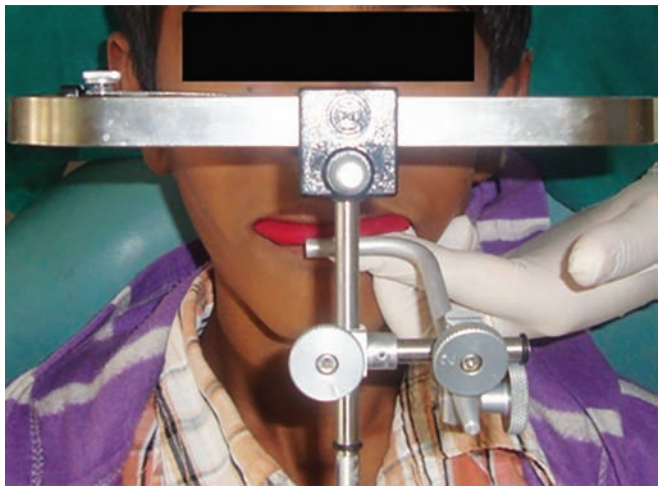

Fig. 5: Face bow transfer

short clinical crowns, occlusal wear with exposed dentin in the posterior areas, and open bite in the left posterior occlusion (Fig. 4). The patient had acceptable oral hygiene.

Prior to treatment, the vertical dimension was measured. Loss of vertical dimension of 2 to 3 mm was recorded. The maxillary and mandibular impressions were obtained, and the maxillary cast was mounted on a semiadjustable articulator (Hanau Wide-VUE, Whip Mix Corp, Louisville, KY, USA) using an ear piece face-bow transfer (Fig. 5). Interocclusal record was made using Lucia Jig to guide the mandible into centric relation and retain centric relation in position for records. The mandibular cast was mounted using the interocclusal record. Splint therapy with increased vertical dimension of 2 mm was given in the maxillary arch for 4 weeks. No ill effects of the increased vertical dimension were observed during the splint therapy. Accordingly, a treatment plan was developed with these aims: Improving the malocclusion, restoring masticatory function, and improving the patient's appearance. Treatment options considered were fixed prosthodontic treatment or extraction of remaining teeth followed by removable or implant-supported fixed prosthodontic treatment. Due to the erupting phase of dentition and economical consideration, temporary fixed prosthodontic treatment with high-density polymethylmethacrylate crowns was decided.

Diagnostic wax up and acrylic provisional crowns were kept ready prior to treatment. All teeth responded normally to pulp sensitivity tests. Firstly, tooth preparation with a circumferential chamfer margin configuration was performed under local anesthesia in the maxillary and mandibular anteriors. The splint was trimmed from the anterior region leaving the posterior splint, followed by temporization of maxillary and mandibular anteriors. In the following appointment, the maxillary and mandibular posterior tooth preparation was performed and acrylic provisional crowns were cemented for 2 weeks.

Impressions were made with addition silicone impression material (Aquasil, Dentsply, Germany) using stock trays (Fig. 6). Master casts were mounted on a semiadjustable articulator (Hanau Wide-VUE, Whip Mix Corp, Louisville, KY, USA), using an ear piece face-bow transfer and interocclusal record using the Lucia Jig. For the final restoration, high-density polymethylmethacrylate provisional crowns (Polident, Slovenia) were fabricated with computer-aided design (CAD)/computer-aided manufacturing (CAM) technique

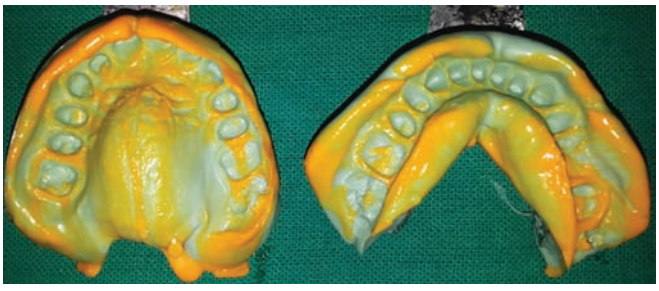

Fig. 6: Final impressions

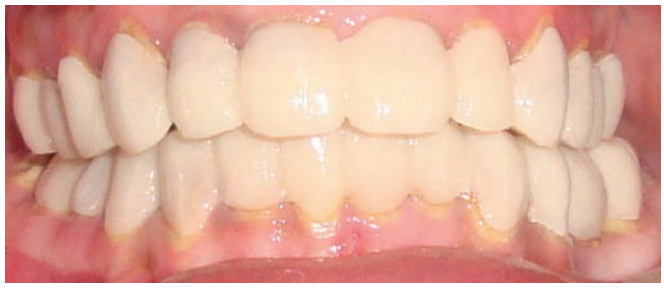

Fig. 7: High density PMMA provisional restoration using CAD-CAM

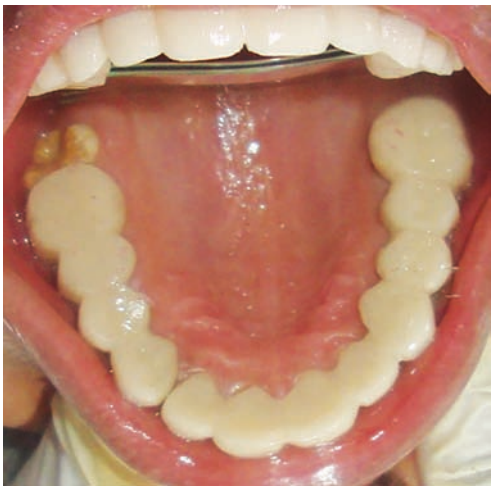

Fig. 8: Occlusal view showing provisional restoration in maxillary arch

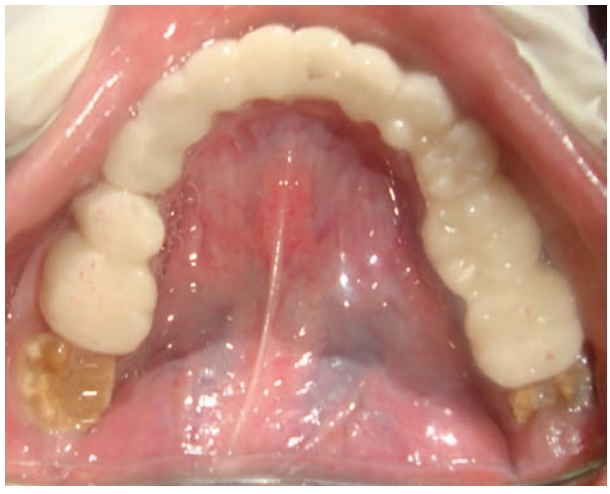

Fig. 9: Occlusal view showing provisional restoration in mandibular arch

with the 2 mm increased vertical dimension. The marginal fit and occlusion of the crowns was evaluated intraorally, and the crowns were then cemented with dual-polymerizing resin cement (RelyX™ Unicem 2 Automix Self-Adhesive Resin Cement, 3M ESPE, USA) (Figs 7 to 9). The patient was pleased with the result and was motivated to maintain his oral hygiene.

DISCUSSION

Management of AI in the young adult using fixed prosthodontics is not a novel approach, but is possibly an underutilized one.[15] The temporary fixed prosthodontic treatment selected, albeit invasive, is more conservative than other considered alternatives. Other treatment methods involving fixed prosthodontic treatment or extractions of remaining teeth and placement of removable prostheses or extractions of remaining teeth combined with implant-supported fixed or removable prosthodontics are considerably more radical and have greater incidence of clinical complications than conventional fixed and removable prosthodontics.[16,17] The dentition is still in erupting stage, and managing the condition with fixed prosthodontic treatment will not be a permanent solution. The option of high-density polymethylmethacrylate crowns not only will temporarily manage the problem till the erupting stage is completed but also is cost-effective. However, this option requires the patient to maintain meticulous oral hygiene since caries of abutments is the leading complication of fixed partial dentures (FPDs) supported by the natural dentition.[18]

CONCLUSION

Full mouth rehabilitation of amelogenesis imperfect patients entails good understanding of the disease, management tactics for severely damaged dentition, knowledge of maxillomandibular physiology, and dental materials science. This case report demonstrated an uncomplicated way of using high-density polymethylmethacrylate restorations to fulfill the requirement of esthetics and function of patient with hypoplastic-type AI with erupting dentition and economic considerations.

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