

Esthetic and Functional Rehabilitation of a Patient with Amelogenesis Imperfecta Using Adhesive and Non-Invasive Techniques: A Case Report

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Abstract

Introduction: Limited evidence is available on adhesive dentistry in the management of amelogenesis imperfecta (AI). The presentation, the conservative management with adhesive techniques, and the outcome of hypoplastic AI are discussed. **Case Report:** Autosomal dominant, hypoplastic AI was diagnosed, on a 36-year-old woman, presented with unesthetic teeth and a history of frequent decay with subsequent complications. Following the hygienic phase, stabilization of caries and root canal treatment (RCT) were done. Coronal restoration of endodontically treated teeth and light-cured direct composite veneering were done in the restorative phase. Surveyed crowns, mucosa-borne partial denture, and a resin-bonded bridge were prescribed in the prosthetic phase. The patient was pleased with the improved masticatory ability and esthetics. **Discussion:** A stepwise least invasive, yet esthetically acceptable treatment options based on adhesive techniques are successful in hypoplastic AI.

Keywords: Adhesive technique, amelogenesis imperfect, esthetics

INTRODUCTION

Amelogenesis imperfecta (AI) is a hereditary condition that is associated with developmental alterations in the quality and quantity of enamel leading to esthetic and functional deficits.^[1] Conventional indirect restorations are discouraged due to the associated structural compromise.^[2] Despite the presence of suboptimal enamel, a limited literature describes the successful practice of adhesive dentistry in the management.^[3]

The conservative management of a patient with hypoplastic AI complicated with discoloration and tooth loss using adhesive techniques is described.

CASE REPORT

History, examination, and investigation

An otherwise healthy 36-year-old woman, presented with unesthetic appearance,^[4] and history of frequent decay leading to pain and extractions. Teeth were discolored from the time of the eruption including deciduous teeth. Her brother, father, and paternal-grandmother had a similar condition.^[4]

Examination revealed mild gingival inflammation, septic root in 46, and absent teeth in 15, 25, 28, 35, 36, 37, and 38. The enamel was hypoplastic with rough enamel surfaces and horizontal grooves in upper central incisors. Enamel was hard on probing without significant tooth wear. Spacing was evident in the lower anterior region.

We found, plaque and calculi in some teeth, pulp exposed 14, arrested caries in 16, 44, and 45, active caries in 17 and 18 (non-functional), mesio-distal space loss in 25, unopposed and mesially drifted 26, and, heavily restored asymptomatic 47. The lower-arch had Kennedy Class-II modification-1. Occlusal vertical dimension (OVD) was acceptable with

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stable centric occlusal relationship. Basic periodontal examination revealed code-2 in all sextants.

The panoramic radiograph revealed periapical radiolucency in 14, 46, and 47 [Figure 1(a)]. Periapical view of 47 confirmed the periapical radiolucency and root-canal obturation. Although the enamel appeared thin, there was radiographic demarcation between enamel and dentine. Fourteen was negative for the sensibility test.

Based on the histopathological analysis [Figure 1(b)], the diagnosis of autosomal dominant, hypoplastic AI was made.^[4]

Management

A stepwise treatment plan was discussed^[4] and initiated. Dietary advice was given based on the analysis. Full

mouth scaling and polishing were performed and topical fluoride-gel (0.2% w/w) was applied (GC Tooth Mousse-Plus, IL, USA).

Upper and lower alginate impressions (GC Aroma fine Plus, Banksmeadow, Australia) were made. The root-canal of 14 was dressed with calcium hydroxide (Calplus, Jammu, India). Extraction of 46 septic roots and non-functional 18 were done. Eighteen was sent for histopathological analysis. A diagnostic-wax-up was constructed [Figure 1(c)] to demonstrate and obtain the consent.

RCT of 47 was performed.^[4] 17, 16, 44, and 45 were restored with Light cured composite (3M ESPE, MN, USA). Minimal preparation of 16 was done for the Resin-Bonded Bridge (RBB). Upper and lower impressions were made and sent to

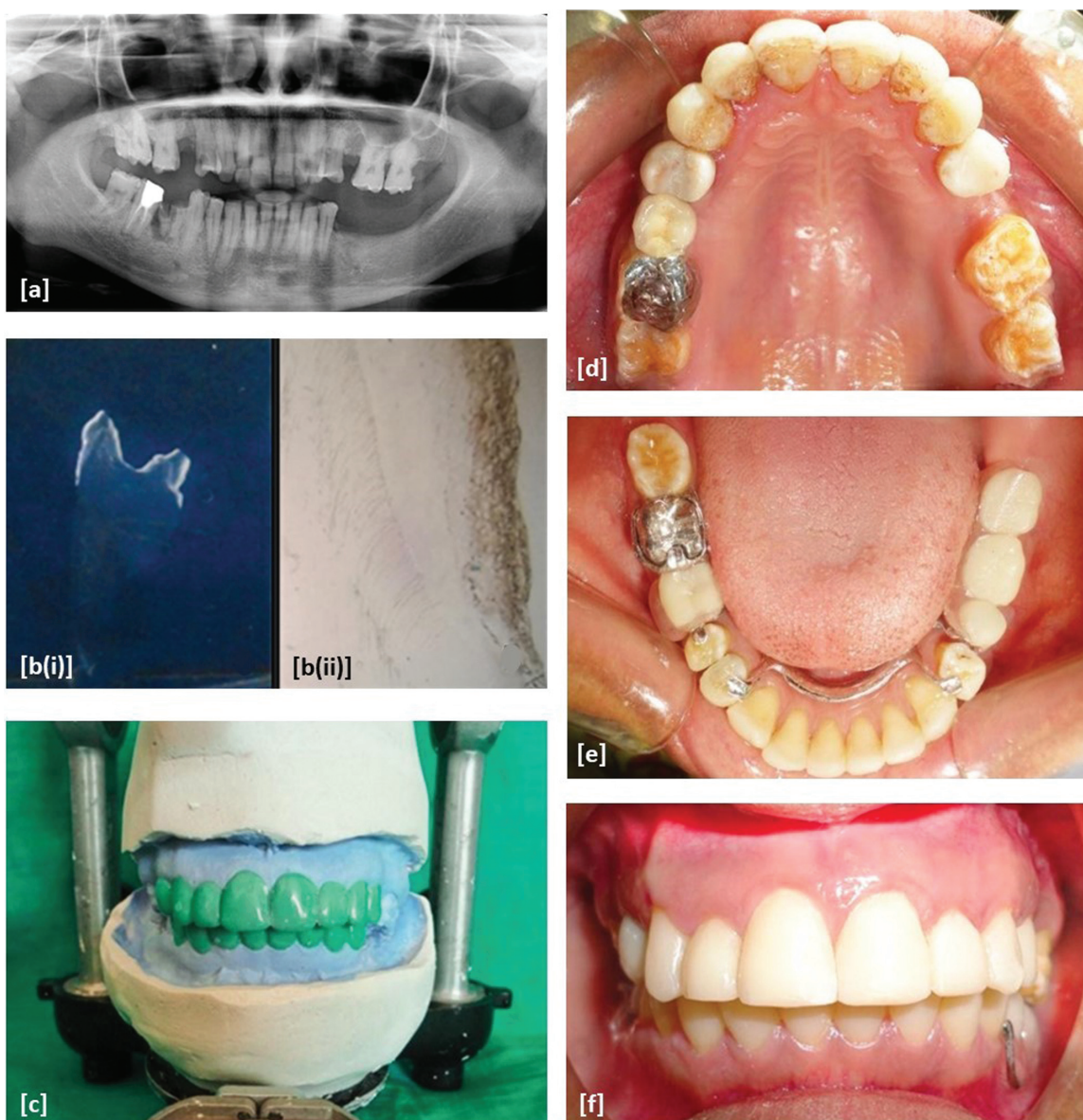


Figure 1: (a) Preoperative panoramic radiograph, (b) ground section of 18 (i) after staining (ii) under magnification, (c) diagnostic-wax-up, (d) postoperative photograph of the upper arch. (e) Postoperative photograph of the lower arch with the cemented crown and the denture in situ, and (f) postoperative photograph (anterior view).

the laboratory with a face-bow recording (Hanau Buffalo, NY, USA). Wax patterns for the RBB and the surveyed crowns were assessed and resent for casting.^[4]

Following cementation of 47 surveyed crown abutment teeth of the lower denture were prepared [Figure 1(d)]. A lower denture impression was made using medium-bodied silicone (Aquasil Ultra+, Dentsply, DE, USA). The lower metal denture framework was tried to confirm satisfactory adaptation, retention, and stability.^[4] A close-fitting custom tray (mega TRAY, Radeberg, Germany) was constructed over the distal extension saddle. An altered cast impression of the distal extension saddle was made using light-bodied silicone.^[4] The resultant altered cast was used for the subsequent steps in the fabrication. The lower removable partial denture was delivered following necessary occlusal adjustments [Figure 1(e)].

Obturation was done in 14 following the relief of symptoms. A coronal seal was obtained with a light-cured composite. Following adjustments 15 RBB was cemented (Panavia, Kuraray, Okayama, Japan).

Veneering up to the second premolar in both arches was performed using light cured composite (3M ESPE, USA), according to the diagnostic-wax-up. QHL75 Dentsply curing light was used. Upper and lower silicone putty indices that extended onto the labio-incisal edges of the anterior teeth were made. Palatal and incisal aspects of the teeth were built up using the silicone key (Aquasil-Dentsply, USA). Interproximal separation was achieved using cellulose acetate matrix strips (Crosstex, NY, USA). Occlusion was adjusted and shared anterior guidance was obtained. [Figure 1(d-f)].

She was advised on plaque control and the review protocol. The patient was satisfied on improved functional and esthetic outcome.

DISCUSSION

Patient education and hygiene minimize the effects of AI. The prevention and stabilization of primary diseases should be performed before advanced restorations. Restoration of active caries, stabilizing endodontic health, and extraction of un-restorable help to alleviate pain and create conducive oral-environment.

The conventional indirect restoration was a popular treatment modality in dealing with discoloration and morphological problems in AI. They have been the most predictable and durable esthetic restoration to date.^[5] However, the conventional crowns are discouraged in AI due to the required heavy preparation and possible loss vitality of tooth.^[6]

Resin composite used either in indirect or direct techniques, is an alternate veneering material in discolored anterior teeth. The indirect techniques have better esthetic and anatomic contours^[7] though they are less conservative and expensive. The bonding between the restoration and the tooth is important for the retention and strength of the veneers,

dentine-bonded crowns, and resin-retained bridges.^[8] Considering the minimal biological and financial cost, the patient's choice of conservation, and the advantages of adhesive techniques, direct composite veneers for the restoration of anteriors were prescribed. The use of a stable, rigid silicone matrix guided from the diagnostic-wax-up produced an excellent esthetics.^[9]

The features to retain and support the removable partial-denture were incorporated into the surveyed crown. Endodontically treated posterior teeth restored with cast restorations had better survival.^[10] To minimize the preparation, metal was chosen for restoration.

A minimal preparation was undertaken to prevent failure^[11] associated with the exposure of dentine, which is less than ideal for adhesive bonding of 16 wing retainer in the RBB replacing 15.

Ethical Considerations

Informed written consent was obtained to review medical records and to publish de-identified information.

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Conflicts of interest

There are no conflicts of interest.

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