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Clinical Tech/Case Report

Amelogenesis Imperfecta: A Conservative and Progressive Adhesive Treatment Concept

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Clinical Relevance

This article presents management of a patient with amelogenesis imperfecta through an adhesive and progressive treatment.

SUMMARY

Objective: The aim of this study was to present a case report of a patient affected by amelogenesis imperfecta showing a possible minimal and conservative adhesive treatment approach.

Clinical Procedure: A treatment philosophy of amelogenesis imperfecta is illustrated by means of a case report of a 14-year-old boy who consulted us for a full mouth rehabilitation.

Discussion: This clinical report describes step by step how to manage a case of amelogenesis imperfecta from childhood over time.

Significance: This kind of minimally invasive, progressive approach allows the conservation of maximum tooth substance together with an acceptable esthetic outcome.

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INTRODUCTION

Resin composite materials are widely used due to their good mechanical and esthetic properties and relatively low cost, especially if compared with full ceramic or ceramo-metallic crowns. Their clinical success is related to the materials' capacity to mimic esthetic tooth appearance. Furthermore, it requires common skills in order to reach satisfying results. Due to their potential to re-create the appearance of sound teeth[1] and to their capacity to mask imperfect substrate,[2] their use has been proposed in order to correct congenital illnesses such as amelogenesis imperfecta.[3,4] This is a hereditary disease that causes structural anomalies in dental enamel of the

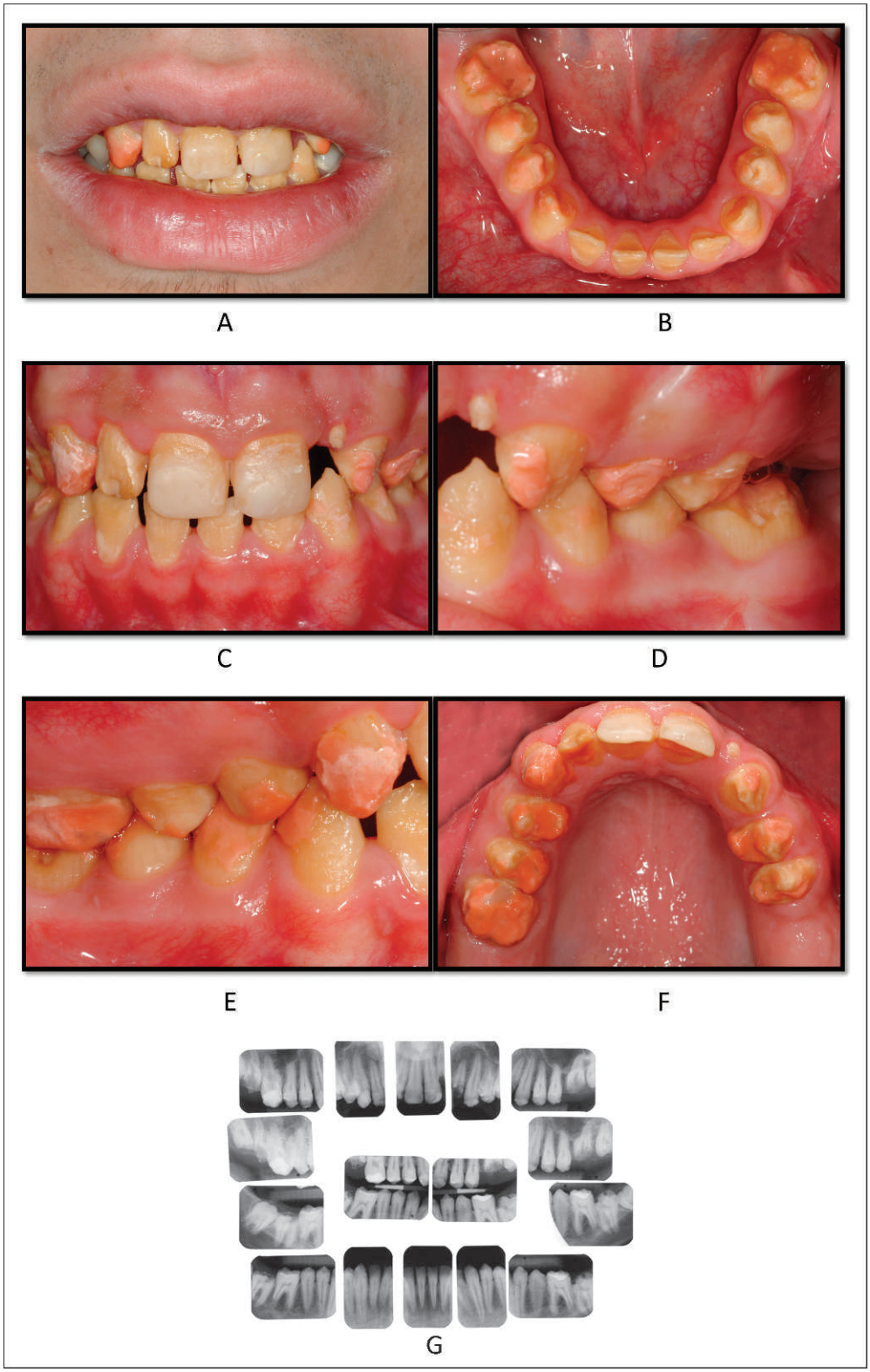

Figure 1. *(*a-g*): Clinical views at the patient's first appointment. Two composite restorations on the upper central incisors as well as glass ionomer cements in posterior areas can be seen in these photos. The last image represents the corresponding treatment status.*

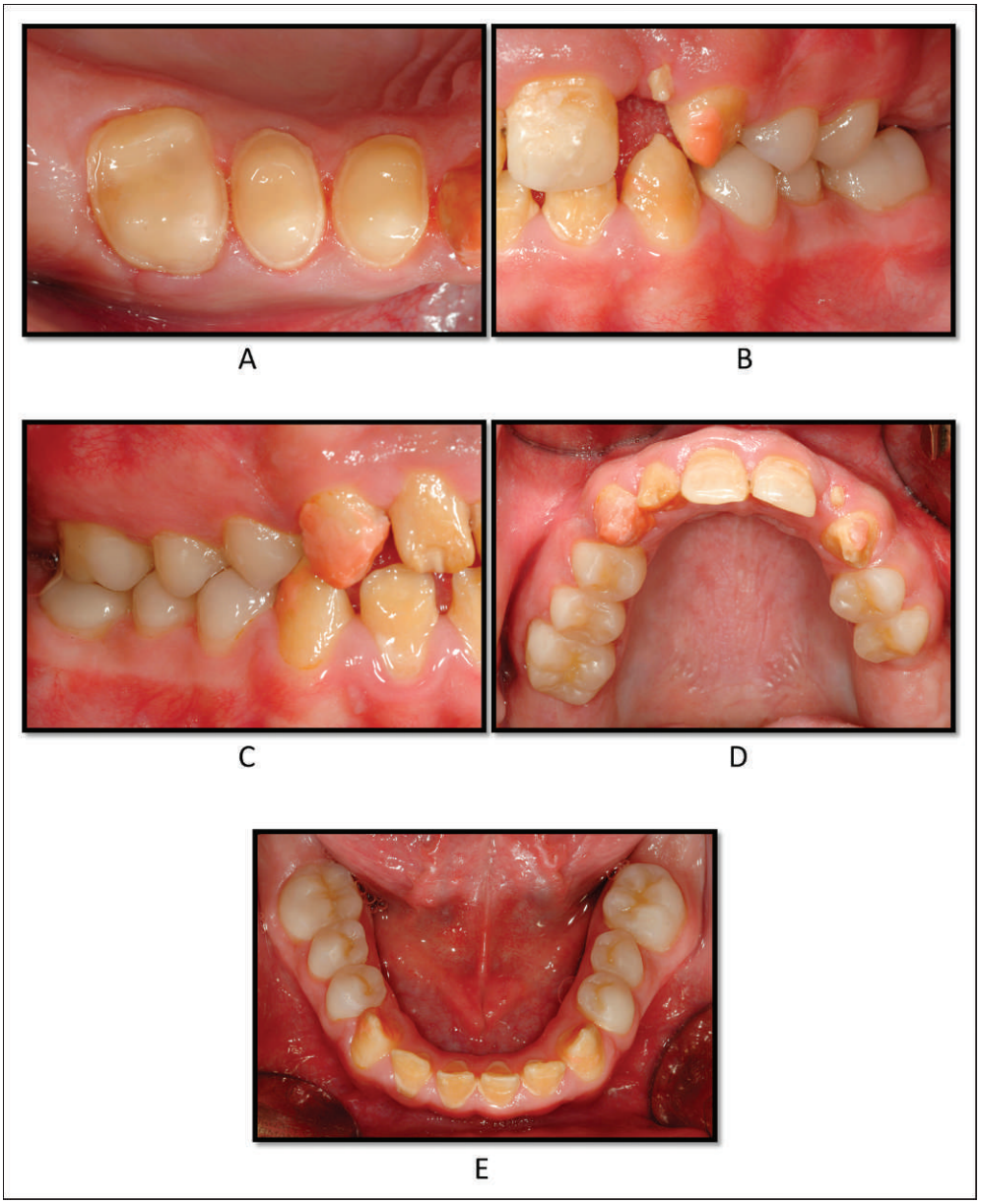

Figure 2. *(a-e): Intraoral view of the conservative preparations for resin composite onlays and clinical view after posterior onlays placement.*

primary and permanent dentition. The anomaly may present a variety of clinical forms and appearances, with its main characteristics being the loss of tooth structure, compromised esthetic appearance, and dental sensitivity.[5]

The aim of this article is to describe, step by step, a rehabilitation concept based on conservative and progressive adhesive treatments by means of free-hand bonded restorations, onlays, and, once complete soft and hard tissue maturation is achieved, adhesive ceramic crowns.

CLINICAL PROCEDURE

Once the diagnosis of amelogenesis imperfecta is confirmed, a progressive, comprehensive treatment plan is proposed to the patient. From childhood and adolescence, patients may complain of teeth sensitivity and an evident lack of esthetics (Figure 1a-g).

Due to the fact that soft and hard tissues have not been completely developed yet, a fixed prosthetic approach cannot be proposed until at least 18–20 years of age.[6,7] In order to answer the patient's demand of not feeling pain during common eating habits and to give him an acceptable esthetic

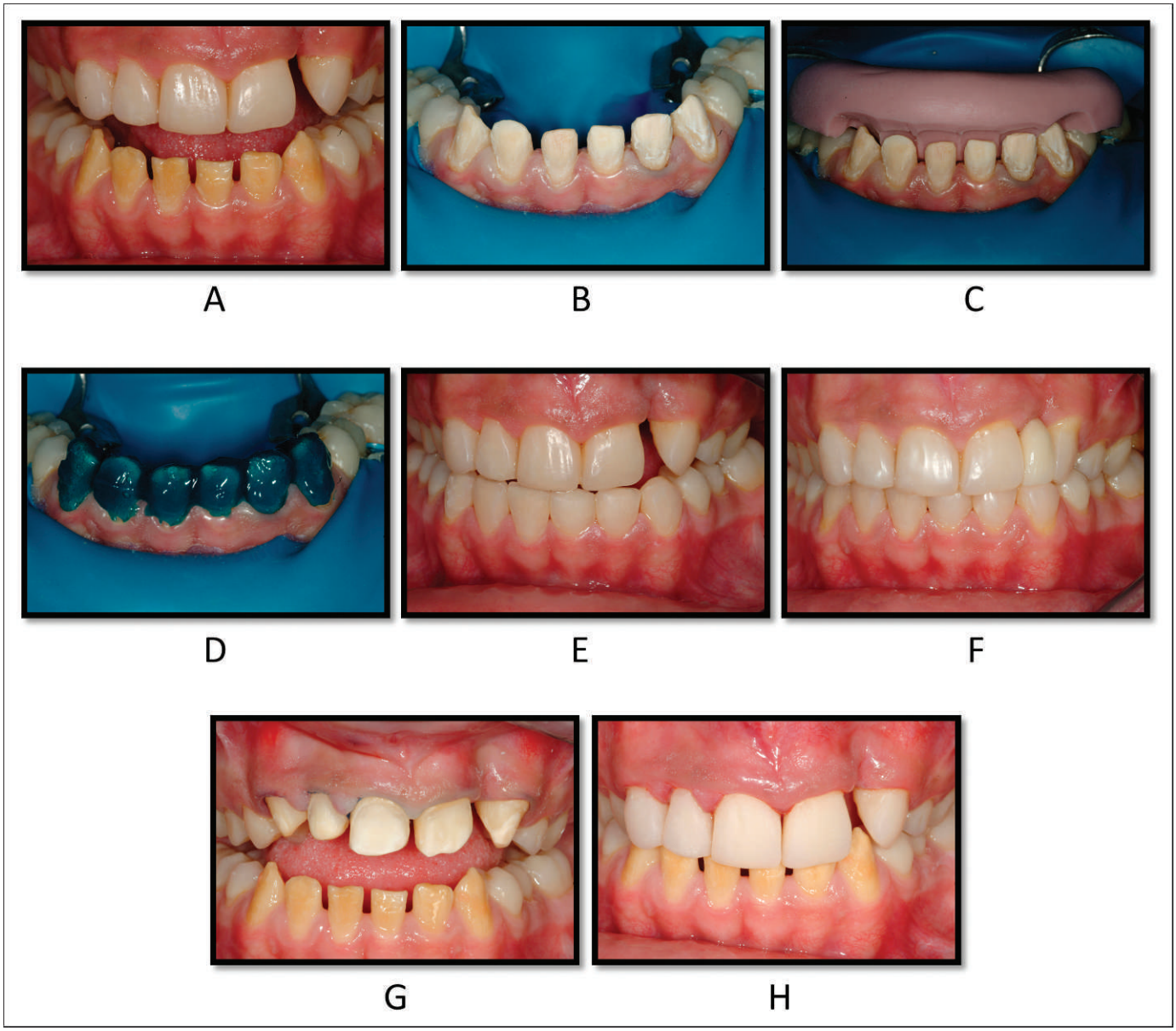

Figure 3. *(a-h): Intraoral view of the preparations for freehand bonded composite restorations and clinical view after teeth rehydration. Last image shows the clinical view after the placement of a cantilever bonded bridge 23-22.*

appearance, a full mouth rehabilitation based on an adhesive approach was planned. In the posterior area conservative resin composite onlays were realized (Figure 2a-e), whereas in the anterior area freehand bonded composite restorations (Miris 2, Coltène/Whaledent, Altstätten, Switzerland) were performed according to the natural layering technique proposed by Dietschi[8] (Figure 3a-h). No orthodontic treatment was realized due to the fact that the patient refused to wear brackets. Finally an adhesive cantilever bridge[9] was seated in order to replace the missing upper left lateral incisor. Having then reestablished function and esthetics, as well as having solved the problem of sensitivity, the patient was kept with these restorations and under recall every 4 months up to the point of complete soft and hard tissue maturation. Four years later, at 20 years of age, a clinical and radiographic evaluation was done, and a crown lengthening procedure of the upper two posterior quadrants was performed. Two months later preparations for lithium disilicate crowns (E Max, Ivoclar Vivadent SAS, Saint-Jorioz, France) were performed on all the teeth, which consequently received their crowns bonded with a

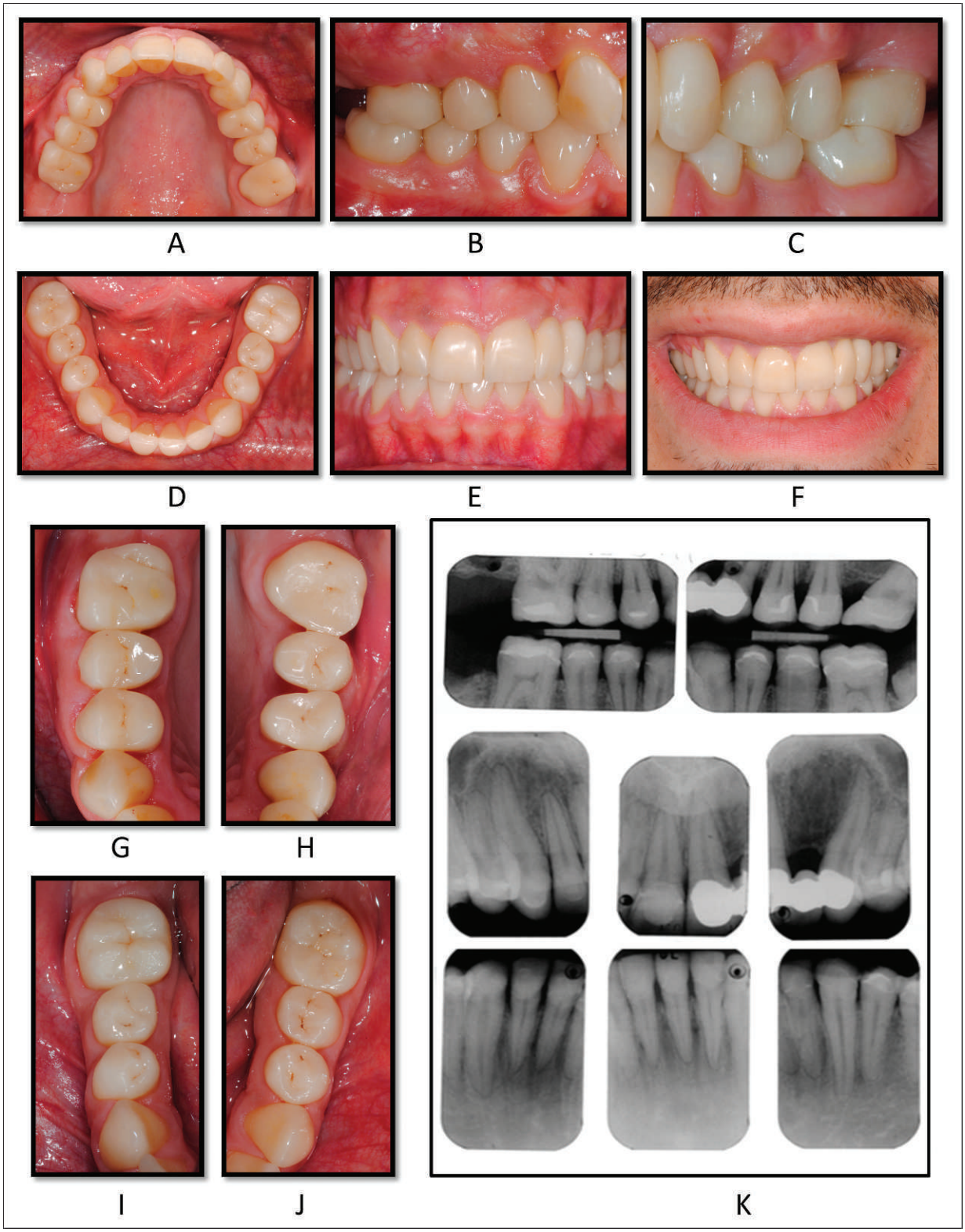

Figure 4. *(a-k): Clinical views at the end of the treatment, together with the final treatment status at the 3-month recall. Except for the lithium disilicate bridge from 21–23, all other teeth are single-unit lithium disilicate bonded crowns. The last image represents the final radiographic status.*

dual resin cement (RelyX Adhesive Resin Cement, 3M ESPE, St Paul, MN, USA).

At the end of the treatment (Figure 4a-k) a vacuum-formed soft resin splint (Erkoloc, Erkodent Erich Kopp GmbH, Pfalzgrafenweiler, Germany) was given to the patient, who was instructed to wear it during the night in order to prevent possible crown chipping and fractures.[10]

DISCUSSION

Adhesive treatment is modern dentistry's answer to the traditional and more invasive prosthetic approach. Bonding procedures have been demonstrated to be a solid tool on which dentists can stand and believe. Resin composite allowed for minimal intervention in this severely compromised case where teeth were affected by amelogenesis imperfecta. The patient's complaints were related to extreme sensitivity that was due to widely exposed zones of dentin and to his unpleasant smile. The two-stage restorative approach was based on a first phase where composite onlays in posterior regions and freehand composites in the anterior sector were realized. During this first restorative phase, minimally invasive dentistry was performed; only the most external, porous enamel layer was removed before resin composite placement. Five years later, at the end of the hard and soft tissue development, an adhesive fixed prosthetic approach was chosen in order to finalize the restoration, always keeping in mind to sacrifice only a minimum of tooth substance. The main advantage of the presented two-stage adhesive approach is that resin composite restorations require almost no maintenance except common polishing procedures. This is a very favorable intermediate solution while waiting for completion of the patient's soft and hard tissue maturation. Furthermore, the first stage can be used as a testing period to check oral hygiene and to determine the definitive form and shade of teeth to be restored. Composite material has some advantages when compared with ceramic restorations: It is less expensive; it allows a direct approach, thus avoiding costs of a dental technician; and it is easily reparable. On the other hand, ceramics may be superior to resin composites in terms of aesthetic, gloss durability,[11] and plaque accumulation.[12] That is why as soon as the patient reached complete soft and hard tissue development, a fixed-adhesive prosthetic approach was used.

With respect to the choice of the ceramic material, among all different products on the market, lithium disilicate crowns were preferred due to their clinical and mechanical advantages. They exhibit high durability, do not appreciably wear the opposing natural dentition,[13] and have already proven that they may be used in clinical situations with promising results.[14] Furthermore, the use of bonding procedures for disilicate crowns have already shown to increase clinical success,[14] offering stable, esthetic, and natural-looking restored teeth to patients.

CONCLUSIONS

This case report describes a possible application of a minimally invasive approach for treating amelogenesis imperfecta in a young adolescent. This conservative adhesive treatment allows a two-stage intervention that accompanies the patient during his adolescence until the complete formation of hard and soft tissues. This will allow acceptable esthetics and lack of pain during eating and will allow the patient to have a more normal social life.

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Conflict of Interest Declaration

The authors of this manuscript certify that they have no proprietary, financial, or other personal interest of any nature or kind in any product, service, and/or company that is presented in this article.

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