

## Case Report

## Management of enamel hypoplasia in maxillary incisors with composite direct veneers: A case report

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### ABSTRACT

**Background:** Dental esthetics is an important aspect that needs to be considered in today's dental treatment planning. Enamel hypoplasia is teeth discoloration from yellowish to brownish due to disturbances during the amelogenesis process. Direct veneers are a conservative treatment option that supports the esthetics of anterior teeth. **Purpose:** To improve patient's appearance by a viable treatment option that offered rehabilitation of anterior teeth. **Case:** A 18-year-old female patient felt uncomfortable and wanted to improve her appearance because the front teeth had old fillings turned yellowish and white spots. Objective examination showed enamel hypoplasia in 12, 11, 21, 22 and secondary caries in 11 and 22. **Case Management:** The treatment plan was direct composite veneers. The initial stage is digital smile design analysis and composite shade selection using the button try technique. Minimally invasive preparations were performed on teeth 12, 11, 21, 22. Etching using 37% phosphoric acid and bonding agent was applied to the prepared enamel. The layering technique is used for composite applications. Finishing, contouring and polishing using Soflex Disc Coarse and Diacom Twist. **Conclusion:** Direct composite veneers are a viable treatment option for patients requiring rehabilitation of anterior teeth.

**Keywords:** Direct Composite Veneers, Enamel Hypoplasia, Medical Science, Aesthetics, Restoration

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### INTRODUCTION

Restoring dental aesthetic is one of the important aspect of dental treatment, besides masticatory and phonation function. Color, shape, and structural abnormalities as well as the position of anterior teeth can cause important esthetic problems for the patient's appearance.<sup>1</sup> Abnormalities in teeth can occur due to environmental impacts, hereditary or can be idiopathic. In the process of tooth formation, enamel has a characteristic that is unable to remodel, therefore any abnormalities that occur during formation will form permanently on the tooth surface and can interfere with patient aesthetics.<sup>2</sup> Enamel hypoplasia is one of the defects in enamel that occurs by impaired secretion of the enamel matrix during tooth formation, calcification and maturation defects and can occur in one or more teeth.<sup>3,4</sup> The degree of enamel hypoplasia caused by systemic disorders can be seen from the severity, time, and duration of the disturbance. There are a number of restorative treatments that can be performed to improve discolored teeth and the patient's appearance. Several techniques have been developed to treated enamel hypoplasia including composite resin restorations, direct composite veneers, indirect porcelain veneers, full coverage crowns, bleaching or microabrasion.

The choice of restoration depends on the severity of the enamel hypoplasia.<sup>4,14</sup>

Veneers are treatments in which a layer of tooth-colored material is applied to the teeth to correct local or general defects and intrinsic discoloration. General indications for veneers are the facial surfaces of teeth that are malformed, discolored, abrasive, eroded or restoration failure.<sup>5</sup> Laminated veneer restorations have two different types, namely direct veneers and indirect veneers.<sup>1</sup> Direct composite veneer is conservative aesthetic restoration technique that uses microhybrid or composite nanofill that is applied to the tooth surface and allows the operator to control and evaluate the entire procedure in one sitting.<sup>6,7</sup> The tooth preparation required is minimally invasive, provides immediate results, costs less than indirect restorations, reversibility treatment and not requiring additional adhesive systems are some of the advantages of this technique.<sup>1,6</sup> Conditions of enamel hypoplasia involving all maxillary anterior teeth and occurring in young adult patients can be treated with direct full veneers.<sup>5</sup> This case report describes the technique of direct composite veneers in reh Aesthetic abilitation of anterior teeth in young adult patients with enamel hypoplasia and secondary caries which affect the patient's aesthetic appearance when smiling.

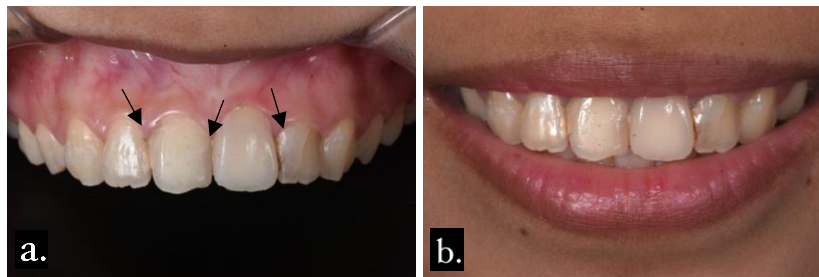
**CASE**

A 18-year-old female patient came to the Department of Conservative Dentistry RSGMP UNAIR complaining that wanted to improve her appearance because the front teeth had old fillings turned yellowish and white spots. She felt uncomfortable and insecure when she smiled. Objective examination showed on Figure 1, there were enamel hypoplasia in 12, 11, 21, 22 and secondary caries in 11 and 22. On intraoral examination, tooth vitality was found (+), percussion and bite test (-) in 12, 11, 21, and 22. On examination of the saliva, the results are 35 second of hydration test, watery viscosity, pH 6.4, quantity 4.5 ml and buffer capacity 7, the state of the gingival tissues were normal and the patient did not have bad habits. The diagnosis of teeth 12, 11, 21, 22 is reversible pulpitis and the treatment plan is direct composite veneers,

plan were carried out as well as analysis using a digital smile design in order to obtain a proportional dental clinical form. From the results of this analysis, it was found that teeth 11, 21 have less volume so that the teeth appear palatoverted and the distal side of tooth 12 appears labioverted that showed in Figure 2. After obtaining informed consent and obtaining patient consent for treatment, determination of the appropriate tooth color was performed using the composite button try technique. In Figure 3, Rubberdam installation was carried out using the split dam technique and continued with tooth preparation. Minimally invasive tooth preparation was carried out on the facial part by reducing the enamel to a depth of 0.5 mm using a depth cutting bur and taking the previous restoration and secondary carious tissue until healthy tissue remained using a round diamond bur. Minimal preparation was performed on the labial surface including bevels and conservative labial reduction using a round end tapered diamond bur until the edge of the feather edge preparation was obtained. After the preparation is complete, the preparation is checked using a silicone guide putty to help the composite layering process, make the composite adaptation better, and determine the centerline.

**CASE MANAGEMENT**

At the first visit, a complete anamnesis, objective examination, diagnosis, and determination of a treatment



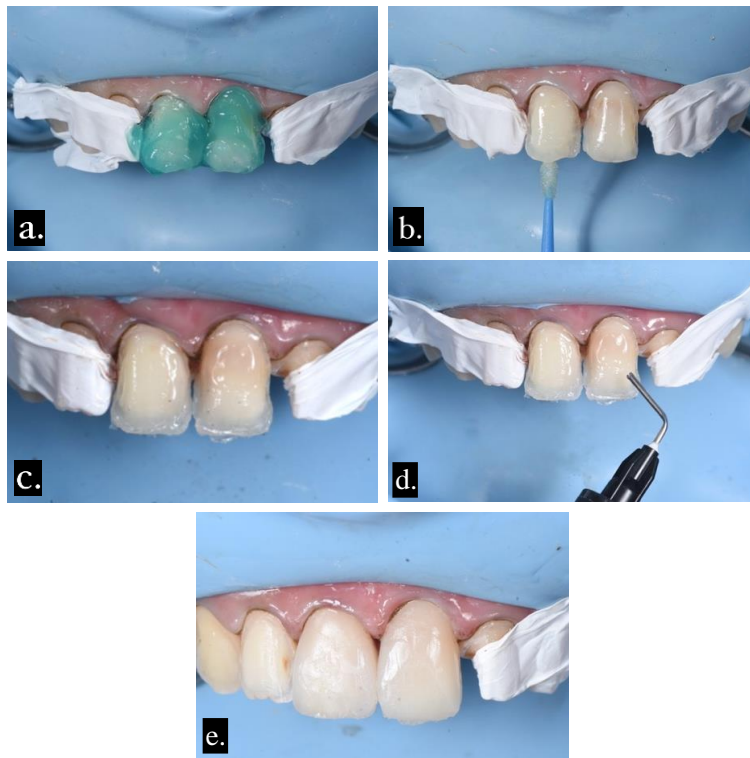
**Figure 1.** Clinical condition: (a) Intraoral photograph (b) Smile photograph. (lesions are indicated by arrows →).



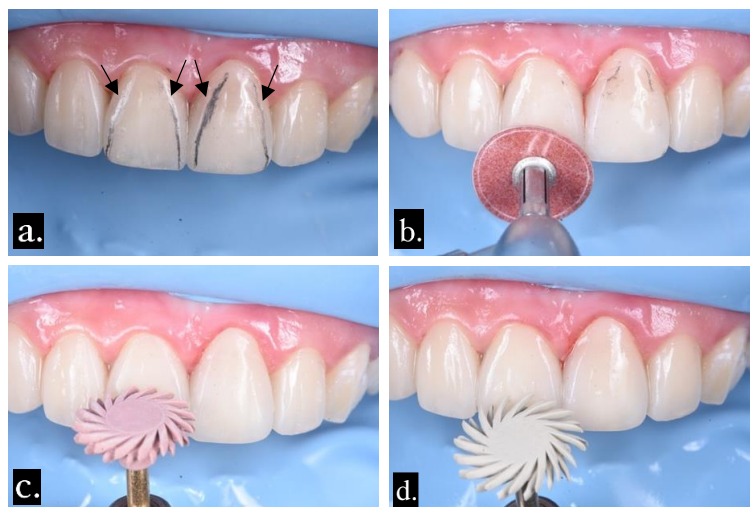
**Figure 2.** Digital smile design.



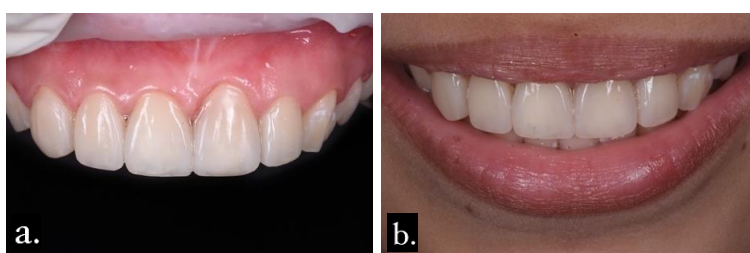
**Figure 3.** Direct veneer's preparation: (a) Rubber dam installation (b) Checking the silicone guide putty (c) Preparation results.



**Figure 4.** The layering technique of direct veneers: (a) Etching procedure (b) Application of bonding agent (c) Preparation of palatal wall (d) Layering mameleon dentine (e) Layering enamel.



**Figure 5.** Finishing and polishing: (a) Formation of a transitional line angle (b) Finishing using a coarse sofflex disc (c) Finishing (d) Polishing.



**Figure 6.** The final result of treatment: (a) Intraoral photograph (b) Smile photograph.

Etched on the enamel surface using 37% phosphoric acid for 20 seconds then cleaned and dried using a three way syringe showed in Figure 4. The bonding agent was applied to the prepared enamel and light cured for 20 seconds. The layering technique was carried out during the application of the composite, beginning with the formation of the palatal wall using the shade Clear Enamel (CE) (Palfique LX5, Tokuyama, Japan) with a silicone putty index guide, followed by layering the dentin and forming the mamelons using the shade AO2 Shofu Dental Composite and layering the enamel shade using White Enamel shade (Palfique LX5, Tokuyama, Japan). In the composite layering step, light cured for 20 seconds in each layer. Composite application and contouring using flat end plastic filling instruments to ensure proper adaptation and good transition between restoration and tooth structure.

The finishing and contouring step began with the formation of a transitional line angle as the primary anatomy using a Soflex Disc Coarse showed in Figure 5 (3M ESPE, USA) then continued with contouring using a friction grip fine diamond bur to obtain perfect visual control and reduce the risk of excessive removal of composite material and polishing of the restoration. was performed using Diacomp Plus Twist (EVE America Inc., Naples, FL, USA) as the final stage of treatment. The results of the treatment are showed in Figure 6.

## DISCUSSION

Dental treatment that prioritizes aesthetics is a major concern and patient request. This is based on a person's cultural, ethnic and individual preferences. A perfect smile will increase the patient's self-confidence, personality and social life as well as having a psychological effect so that it motivates the patient to seek the best treatment to support appearance and self-confidence.<sup>7,8</sup> Abnormalities in the color, shape, structure and position of anterior teeth can cause aesthetic problems that is important to the patient.

In this case, the patient came with the main complaint of feeling uncomfortable and insecure about his appearance because of discolored front teeth. Enamel hypoplasia is a disease of tooth development associated with hereditary and environmental factors including systemic factors in the form of nutritional factors, exanthema diseases such as measles and chicken pox, congenital syphilis, hypocalcemia, injuries during birth or premature birth, excessive consumption of fluoride or idiopathic causes, and environmental factors. local conditions such as infection or trauma to primary teeth.<sup>3</sup>

Demineralization and failure of the enamel calcification process produces white patches as a sign of hypocalcification and generally gives poor dental esthetics, tooth sensitivity, malocclusion and caries predisposition.<sup>4,9</sup> tooth apposition or mineralization. There is a specific index to determine the extent of enamel hypoplasia, namely 0 : no hypoplasia; I: hypoplasia with aplastic defects in enamel; II: hypoplasia with aplastic defects in enamel and dentin; III : hypoplasia

with irregular crown and discoloration where: a: no discoloration; b: white opacity on enamel; c: yellow-brown discoloration of the enamel.<sup>2</sup> It can be concluded that teeth 12,11 and 22 have an index score I and tooth 21 has an index score II. In this case, considering the clinical condition of the teeth classified as mild enamel hypoplasia, the treatment was direct composite veneers in 1 visit.

Direct composite veneer restorations are the most common treatment option because they are conservative, predictable, and easy to repair compared to indirect restorations. Additionally, with this method, esthetic restorations of most teeth can be completed in one sitting cost-effectively and without the need for luting and should fractures or cracks occur in the future, composite direct veneers can be repaired more easily and predictably than conventional veneers. indirect.<sup>6,11</sup> Composite resin color selection is carried out before tooth isolation to avoid discoloration after dehydration.<sup>9</sup> Composite button try technique is a shade determination technique by placing a small amount of composite on the surface of the tooth to be restored and can ensure better color matching compared to the VITA shade guide<sup>12,13</sup> Based on the fact that the VITA shade guide is intended as a shade matching guide for ceramic-based restorations or restorations that require laboratory processing.<sup>13</sup> Window preparation is recommended for most direct and indirect composite veneers. This preparation technique preserves the functional side of the lingual and incisal surfaces of the maxillary anterior teeth and protects the veneers from significant occlusal forces.<sup>8</sup>

To achieve restoration results with aesthetic excellence, the dentist must understand and apply the art and science base when layering composite materials.<sup>10</sup> Preliminary analysis of tooth color involves selecting the base color and detecting the color of opaque and translucent areas. The continued evolution of the composite layering technique has significantly improved the clinical picture of natural-looking composite resin restorations. Today, dentists adhere to the concept of composite stratification and most contemporary composite systems include a wide range of opacity designed for use in advanced layering techniques. The right balance and placement between opaque and translucent colors on restorations is a key factor in achieving natural restoration results.<sup>6,15</sup>

Indirect veneers have a high resistance to friction and fracture and discoloration compared to direct veneer restorations. However, the long processing time, higher costs and the need for the use of an adhesive cementation system are the main drawbacks of indirect veneer restorations.<sup>6</sup> The success of direct composite veneers is highly dependent on the proper case selection and the skill of the operator. Composite direct veneers can be used as a form of staging treatment, providing long-term feedback on aesthetics, function, and phonetics.

In conclusion, composite direct veneers are a viable treatment option to offer to patients who require rehabilitation of anterior teeth but have certain limitations. Composite direct veneers are an aesthetic restorative option that has



a similar finish to the use of full coverage crowns in the past. Direct veneers exhibit natural fluorescence, absorb, reflect and transmit light exactly like the tooth structure and respond to the tissue very well so as to achieve a final result resembling natural teeth.

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