THE AESTHETIC REHABILITATION OF THE PATIENT WITH ENAMEL DEFECTS BY USING COMPOSITE VENEERS (A CASE REPORT)

HAKAN KAMALAK DDS*

*Faculty of Dentistry, Department of Restorative Dentistry, İnönü University, Malatya, Turkey

ABSTRACT

Enamel hypoplasia, which is an aesthetic problem, is the formation disorder of tooth tissue. This disorder is associated with changes in the organic matrix of enamel and causes pits, projections and discoloration ranging from yellow to brown in the enamel. Many applied treatment options are available in order to eliminate aesthetic problems which results from the disorder of development that occurs as a result of hypoplasia in enamel tissue. These can be considered as porcelain laminate veneer restorations, metal-ceramic restorations, full ceramic crowns and direct composite laminate veneer restorations. Among these options, the most conservative ones are the direct composite veneer restorations. Teeth grow out of two types of cells which are oral epithelial cells in which the enamel organ develops and mesenchymal cells in which dental papilla cells proliferate. Enamel grows out of enamel organ, whereas dentine grows out of dental papilla cells. Interaction of epithelial and mesenchymal cells is important in the formation of teeth. The formation of dentin is called as Dentinogenesis, the formation of enamel is called as amelogenesis. Anomalies seen in these phases, causes the formation of teeth. [1-4]. In permanent and deciduous teeth, the structural changes such as number, shape and size or changes in tooth tissues can be seen. Dental anomalies may occur as a result of genetic factors, environmental factors, systemic or local changes or may occur as a combinations of all these factors. the anomalies that occur during the loss or eruption of deciduous teeth can create examples to make determination about the eruption of permanent teeth. [5-10] In this case report, direct composite laminate veneer techniques and aesthetic rehabilitation, which have been carried out by taking economic and social factors of the the patient with enamel hypoplasia in to account have been told. The teeth, without making any preparation on enamel surface, were restored using composite resin (Arabesk, Voco, Germany), layering techniques, bonding agent (Clearfil SE Bond, Kuraray, Japan), phosphoric acid gel of % 37 (Etching Gel, Kerr, USA). Patients were evaluated after six months and patients were evaluated after six months.
INTRODUCTION

Dental anomalies may occur as a complex with genetic syndromes or systemic diseases. They can also be observed in the form of hereditary disorders. [11]

The type and severity of anomalies, especially during the time when disorder occurs, depend on the embryonic period [11] that contains the relevant germ layer and on the effect of several individual and environmental factors [12-16].

There are two types of enamel defects. The first one is hypoplasia. It occurs depending on the disorder of matrix production. The second one is hypomineralisation. It occurs depending on inadequate mineralization of matrix proteins. In the teeth with hypoplasia, enamel could be thin, striped or dotted. In hipomineralized teeth, spots are observed [17]. When we examine the causes of developmental anomalies of the enamel;

Enamel Defects Linked to Environmental Factors

Enamel defects originated from environmental factors occur during the development of the teeth, either systemic or localized as a result of interaction. When systemically affected, the severity of the defect depends on which period of the systemic diseases it occurs. This interaction is observed on prenatal, perinatal, neonatal and infancy or early childhood period, (in the period when the third molars develop) namely it is seen during development of the enamel in primary and permanent teeth. The affected degree of enamel is linked to in which stage of tooth development period it occurs. [18,5]

Systemic Enamel Defects

The changes in Mother's and the baby's intrauterine life condition can have different effects on mines during the development of enamel. For example, endocrine disorders (hypoparathyroidism), infections (rubella), nutritional deficiencies (vitamin D deficiency in the mother), hematologic and metabolic can be counted [18,5].

In these cases, hypoplasia and hipomineralize areas occur on the milk incisal edges of the teeth. It has been reported that these type of teeth with hipomineraliz and hypoplasia are seen on maxillary cuts of premature babies. It has recently been shown that in these children hypoplasia, depending on orotracheal intubation, developed in the teeth. Neonatal disorders progress with enamel defects in deciduous teeth and the neonatal line is observed on the permanent first molars. This disorder has been reported to have occurred depending on vitamin D deficiency in the mother in neonatal tetany cases. Similarly, systemic irregularities, following neonatal period, can be effective in the development of deciduous and permanent
teeth enamel. In these cases, defects in enamel can change from enamel spots to severe depressions and grooves. [18,5]

Amelogenesis degree depends on the severity of systemic disorders. For example, in febrile rash illnesses, measles, pneumonia or encephalitis, unless complications occur, enamel rarely leads to change. Pits in the outer layer of enamel seem like common brown spots which resembles to hypoplastic changes. The uptake in permanent teeth is usually symmetric, but the intensity varies according to the type of tooth. In general, the affected teeth are maxillary cut, premolars and second permanent molars. Some severe or chronic childhood diseases can lead to enamel defects. Among them, endocrine disorders (hypothyroidism, hypoparathyroidism), nephrotic syndrome associated with chronic renal failure, gastrointestinal system disorders (Choliac disease) can be considered. The use of tetracycline in childhood causes of tooth discoloration. In the process of this drug therapy, it is not clear whether the enamel hypoplasia is responsible or not. [18,5]

Localized Enamel Defects
Local infection or trauma may lead to enamel defects. As mentioned previously, as a result of orotracheal tube pressure to premaksila, unerupted teeth lead to enamel defects. The trauma to the deciduous teeth, in the avulsion or intrusion-involving injuries, may give damage to the underlying permanent tooth. Similarly, if the the periapical or periradicular infections belonging to the deciduous teeth remain for a long time, they lead to changes in the underlying permanent tooth germ. In this case, the enamel defects are surrounded by areas of hypomineralization. Clinically, dental opaque white or yellow-brown discolorations in the form of patches are seen. More severe conditions are observed, less often but l in such a situation, hypoplastic isolated areas appear in the enamel. As a result of trauma to deciduous teeth at an early time, hypoplastic or hypomineralization areas and coronal dilaserasion in the teeth are seen. Upper central teeth are more susceptible. In children with cleft lip-palate, depending on operations, the prevalence of enamel defects in the cuts is high. [18,5]

Idiopathic Enamel Defects
Some enamel defects, which are difficult to determine the cause, are encountered in children in one or more hypomineralization and/or hypoplastic areas and in permanent first molars. In other permanent and deciduous teeth not any changes are observed. In these cases, there is no family story, no systemic or local irregularities that will lead to anomalies. [18]
CASE REPORT

A female patient aged 22 years reported with inaesthetic appearance of teeth both in terms of colour and arrangement. (Figure 1) Further history revealed that the patient noticed scratches on surface of many of her anterior teeth ever since the successor tooth erupted into the oral cavity. Patient belonged to lower socio-economic situation. Patient had not any systemic disease and/or genetic abnormality. In her the clinical examination, being more noticeable on upper anterior teeth, large spots were observed on her vestibular surfaces of the teeth. (Figure 2) and the patient was diagnosed with enamel hypoplasia.

![Figure 1: The clinic image of the patient before treatment.](image_url)

In the radiography taken from the patient, except for caries (14,15,16,17,27, 46 FDI System) in some regions, not any anomalies were encountered. (Figure 3). Root length of teeth was normal. Periapical radiolucency were seen in 36 (FDI system). Radiographic examination in form of panoramic revealed the absence of enamel in some teeth especially maxillar and mandibular anterior teeth. Lateral teeth were conical in shape. Mandibular third molar teeth has mucosal retention. Before starting treatment, oral hygiene has been corrected and oral hygiene education were given. And after evaluating the patient' expectations of economic conditions; minimally invasive treatment and direct composite laminate veneer restoration was decided. Lastly after restorative treatment, patient was informed about treatment of embedded wisdom teeth.
After evaluating the patient's expectations, considering the economic conditions, as well, direct composite veneer restoration work which was minimally invasive and could meet the aesthetic expectations of the patient was decided. After 35% phosphoric acid gel (Scotchbond Multi-Purpose Etchant; ESPE, USA) was applied to all enamel surfaces for 30 seconds, it was washed with water spray for 15 seconds and then was dried by squeezing mild weather. The prepared binding agent (CLEARFIL SE Bond Kuraray, Japan) was applied to all enamel surfaces and was polymerized by light for ten seconds. The materials used in the study are shown in Table 1. The previously selected colors were respectively applied in layers and each layer was polymerized by light for 40 seconds. Finally, finishing and polishing process was completed using disc-type sanders (Sof-Lex, 3M ESPE, USA) and composite polishers (Flexi-Snap KIT, EDENTA, Switzerland) in series (Figure 4). The treatment the patient has met all aesthetic, functional and economic expectations of the patient (Picture5). The patient was given oral hygiene education required to comply.
Table 1. Materials used in these cases.

<table>
<thead>
<tr>
<th>MATERIALS</th>
<th>PRODUCER FIRM</th>
<th>THE PURPOSE OF USE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transparent Matrix Band</td>
<td>Kerr Hawe Stopstrip, China</td>
<td>Proximal Adaptation</td>
</tr>
<tr>
<td>Kama</td>
<td>Fixing Wooden Wedges, E.U.</td>
<td>Excellent Filling Without Overflow</td>
</tr>
<tr>
<td>The Phosphoric Acid Gel of %37</td>
<td>Etching Gel, Kerr, USA</td>
<td>Roughen the Surface of the Enamel</td>
</tr>
<tr>
<td>Bonding ajan</td>
<td>Clearfil SE bond, Kuraray, Japan</td>
<td>Increase Retention</td>
</tr>
<tr>
<td>Composite Resin</td>
<td>Voco Arabesk Composite Resin, Germany</td>
<td>More Resistant Aesthetic Restoration</td>
</tr>
<tr>
<td>The Finishing Discs</td>
<td>3M ESPE Sof-Lex, U.S.A</td>
<td>Smooth Surface</td>
</tr>
<tr>
<td>The Finishing Fresis (ankansas)</td>
<td>FG Diamond Bur Composite Finishing Kit</td>
<td>Smooth Surface Form</td>
</tr>
</tbody>
</table>

**Figure 4:** The image of the patient after treatment

**Figure 5:** The image of the patient after treatment

**DISCUSSION**

Direct composite veneer restorations is today a treatment option in dentistry that has increased in popularity. With the advantages of low cost, applicability in a single session, and it does not need to laboratory procedures. Also, giving aesthetic results and having high
physical properties with the advances in restorative materials used today has made these applications to be preferred.[19]

While the priority of the patient was not to feel pain in the past, today aesthetic concerns have taken its place. In dentistry, in aesthetic restorative treatment, it is important to make the proper restoration and material selection to mimic the appearance of natural teeth.[20]

Composite veneers applied in the clinic with minimal removal of tooth structure that is the other aesthetic treatment options. In some case, the patient's aesthetic expectations, owing to the minimal tooth preparation, is easily and in a short time met without needing any anesthesia.

During the restoration, an excellent insulation is very important. However, periodontal health is not in an excellent condition or if the tissues were given damage during the preparation of the surface, no matter how much measurement you take, the tissues will bleed and may have a negative effect on binding. Mechanical forces, chemical stimuli and roughening agents can lead to bleeding. This condition will not only lead to micro leaks, by affecting the binding, it will also cause color changes.[21]

Color mismatch or discoloration may cause a failure. To avoid incompatibility with the natural color of teeth, color selection with restorative filling material should be made carefully. The color of the adjacent teeth can be utilized. The tooth color taken from an extremely dry tooth can cause aesthetic problems. A dry tooth, appears lighter in color than the original color, and it is especially pronounced in dark, colored the teeth [22] The color selection should be made in an environment with daylight and in a place where refractory light is off. During this time the patient shouldn’t have any makeup on the lips. Without straining your eyes over the choice of colors while being flush with the patient must be made at one time. The choice of colors must be made at one time without straining the eyes and while being flush with the patient.

Nowadays, dental practices phonation as well as natural teeth in function and aesthetic reintegration of the patient is also to the fore. The frequently used methods in order to resolve this problem is to cover the teeth with crowns. However, the excessive cuts in teeth for this process creates problems in young individuals and even if the crowns have been done well, damages around gums and tissues can be constituted. To resolve these problems, with the goal of aesthetic and functional restoration as an alternative to crowns new adhesive and composite materials have been developed. [23]
Direct composite veneer applications are preferred due to its relatively low cost, instant aesthetic results, and due to its possibility to be made in a shorter time because they haven’t got any laboratory operations. Even if they are aesthetic, composite veneers, contrary to the ceramic ones, they can’t provide enamel-like reflection and light transmission. In addition, composite veneers are even more vulnerable against cohesive fracture. Therefore, when it is desired to increase insizo-gingival size of the teeth, ceramic laminate veneers must be preferred, because porcelains are resistant to adhesive and cohesive forces. However, if the break occurs, Composite veneers have the advantage of being repaired by means of the addition of composite resine [24].

Thermal changes can create stress in a healthy natural teeth. But, in the use of composites, when compared with teeth and ceramics, these properties are increasing owing to the high coefficients of thermal expansion.[25] Day by day new adhesive materials and composites have been developed in order to evolve the clinical performance of restorations.[25]

Even if aesthetic results can be obtained from composite veneers, when ceramic laminant veneers are compared with resin veneers, resin veneers are thought to be superior in terms of marginal adaptation and microleakage. [26,27] When properties, like colouration, microleakage, marginal fracture, records retention, abrasion are considered, Porcelain laminate veneers can be said to be more successful in the long term when compared to composite laminate veneer restorations. [28-31]

CONCLUSION

While a dental surgeon who treats the anterior teeth with enamel defects thinks on the treatment alternatives in that aesthetic is to the fore; he also shouldn’t ignore cost, social factors and the time factor between choices. In this case report, these factors in mind, the direct veneer technique, applied to the patient with hypoplasia, has been tried to explain. For the success of the technique, the motivation of oral hygiene, proper indications and a good cooperation of the patient are required. In aesthetic restoration of teeth discoloration, even if both composite and porcelain laminate veneers indication are thought, when the clinician make a choice between two options, and he also should consider aesthetic, technical accuracy and the cost except for the layer of the tooth in which discoloration has intensified [32].

REFERENCES