

# A Little Touch for Aesthetic Smiles: Resin-containing anterior lamina veneers

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### Abstract

Lamina veneers, one of the restorative dentistry applications, <sup>4</sup> play an important role in the formation of acceptable aesthetic results. It is frequently preferred by dentists, as minimally invasive procedures are sufficient for its application. With the advancement of adhesive technology, resin-containing restorative materials are also used in the application of anterior lamina veneers. Resin-containing anterior lamina veneers; It is formed in the mouth by direct method and outside the mouth by indirect methods. Indirect methods have been developed to prevent polymerization shrinkage that occurs in the direct method. In indirect methods; It is aimed to improve the physical properties of lamina veneers with the help of factors such as heat, light and pressure. With the advancement of technology day by day, the production of computer aided lamina veneers is possible. In these systems, resin-based blocks are used to combine the properties of porcelain and resin, creating wider usage areas. This study has been prepared to present up-to-date information about resin-containing anterior lamina veneers, which have an important place in restorative dentistry and are frequently used in the formation of aesthetic smiles.

**Keywords:** Aesthetic smile, Anterior lamina, Composite lamina, Lamina veneer.

### Introduction

The concept of aesthetics; It appears in many fields such as art, architecture and lifestyle. With the advancement of civilization levels, the concept of aesthetics meets more and more meanings. Appearance is described as an aesthetic element in the eyes of people. Day by day, the requirements for aesthetic needs are increasing day by day. Part of the concept of aesthetics, which includes appearance; teeth, lips and laugh line. In case of need in this regard; restorative dental treatments, periodontal treatments, orthodontic treatments are performed separately or in combination (1).

In the field of restorative dental treatment, there are many aesthetic dental applications within today's possibilities. These; It is possible to list them as dental bleaching, crown coating, aesthetic contouring, micro abrasion, macro abrasion and lamina veneer (2).

When determining the type of treatment to be applied to the patient, many situations are taken into consideration. Among these situations; Criteria such as the condition of the existing teeth, their occlusion, the health status of the gums, the facial features of the individual and the need for orthodontic treatment are examined. In addition, the economic status of the patients and their expectations after treatment should not be ignored (2). While deciding on the type of treatment, all these conditions should be evaluated and detailed information should be given to the patient (1).

The discoloration of the teeth is divided into two classes as intrinsic and extrinsic origin. While internal discolorations usually originate from systemic diseases, external discolorations occur as a result of factors such as tea, coffee, cigarettes and mouthwash (3,4). Intrinsic coloration usually occurs in the second trimester of intrauterine life and continues until the age of 10. This situation is often caused by tetracycline group drugs and fluorosis cases (5). However, whitening should not be performed in cases of fluorosis if there are fractures, cracks and erosions in the relevant tooth (6).

In crown veneer processes, teeth are shaped according to certain principles and restored in appropriate ways. This method, which is applied in anterior teeth, includes invasive procedures (7).

There are different applications in the aesthetic contouring method. These; abrasions to the cutting edges, rounding of the corners, rearrangement of the occlusion, and shaping of the teeth with a small amount of abrasion (8).

Whitening process; More effective results are obtained when applied in combination with macro abrasion and micro abrasion methods. Removing a small amount of enamel tissue with the help of diamond burs is defined as the macro abrasion method. In the micro-abrasion method, hydrochloric or phosphoric acid is added to the pumice and the teeth are brushed with this mixture (4).

### **Lamina Veneer**

Lamina veneers have been developed to save Hollywood artists, who are faced with having their teeth cut due to their roles. For the first time, It was started to be applied by Dr. Charles Pincus in the 1930s (9). According to the way they are applied in the clinic, a choice is made between two methods, direct and indirect, in the production of lamina veneers. Before choosing the method, the appropriate indication should be determined. This is important for the success of the restoration. In the production of lamina veneers; acrylic, porcelain and materials containing resin are used (10).

### **Lamina Veneer Indications**

There are many treatment options available in aesthetic dentistry applications. However, the situations in which each treatment option can be applied are different. The situations in which lamina veneers are indicated are listed below (10-12).

- In tooth discoloration and colored restorations caused by different reasons
- In the elimination of diastemas between the teeth in the anterior region
- In cases of various hypoplasia and malformations
- When existing restorations on the labial surface need to be changed
- In teeth that are exposed to erosion and do not lose much enamel
- Simulation of canine tooth crowns to lateral teeth when lateral teeth are absent
- When crown coating cannot be performed on teeth with a large pulp chamber
- In the presence of crown fractures and wedge defects
- In the presence of rotated or lingualized teeth (13-15).

### **Lamina Veneer Contraindications**

As with every treatment option, there are cases where lamina veneers are not applied. Contraindications for lamina veneers are listed below.

- In cases where individuals have parafunctional habits such as bruxism
- People with a high incidence of caries
- In mouths where adequate oral hygiene is not provided
- In teeth where there is not enough enamel tissue to ensure adhesion

- In cases with head-to-head bite and Class III malocclusion
- In cases where crowding and rotations of the teeth are excessive
- When the eruption of permanent teeth is not completed
- In primary teeth and teeth with excessive fluorosis (16-18).

### **Lamina Veneer Production Methods**

Lamina veneers are divided into two groups according to the way they are applied in the clinic. In the clinic, direct lamina veneers are created by applying resin-containing materials to the tooth surface. In indirect lamina veneers, the lamina veneer is studied by using porcelain or resin-containing material on the model taken from the patient. These laminates are then placed on the tooth surface by means of a bonding agent (19).

#### **a) Direct lamina veneer production method**

In the direct lamina method, the success of the treatment is largely dependent on the dexterity and knowledge of the dentist. This situation can be described as a disadvantage. However, the advantage of this method is that it does not require laboratory procedures during treatment and is more economical than indirect lamina veneers (20).

During the preparation, in order to stay within the boundaries of the intact enamel tissue, firstly, guide burs are used that can make grooves with a depth of 0.3 mm in the cervical 1/3 and 0.5 mm in the incisal 2/3 (21). In lamina veneer procedures, approximately 0.5 mm of preparation is made on the labial surfaces of the teeth (22-24). After the preparation process is completed, adhesive agents are applied in accordance with the recommendations of the manufacturers and polymerization is achieved with the help of a light device. In order to provide isolation between neighboring teeth, the related tooth is wrapped with the help of transparent tape and wedge application is performed. Afterwards, the resin-containing restorative material is placed on the tooth surface and polymerization is achieved with the help of a light device. After the polymerization is completed; The restoration is completed by using diamond finishing burs, aluminum oxide discs and polishing rubbers. The closure status of the patient should be checked for compliance with the restoration (20).

#### **b) Indirect lamina veneer production method**

In the indirect lamina method, measurements are taken from the patient to create a working model. Lamina veneers, which are fabricated or produced by the laboratory, are aligned to the tooth surface and then adhered with the help of binder materials (25).

Indirect lamina veneers are preferred in cases where the discoloration is intense and the discoloration cannot be masked by the direct method. In this method, taking measurements from the patient and finding the laboratory stages is a disadvantage as it prolongs the process. However, it is advantageous that lamina veneers are fabricated or prepared in the laboratory (10).

### **Preparation (Cutting) Stage in Lamina Veneers**

There are some points to be considered during the preparation of lamina veneers. At the end of the preparation, it is necessary to leave enough enamel tissue to ensure maximum bonding. The preparation limits should be clear. Preparation; It should be done at a sufficient depth and the depth should be increased a little more in dark colored teeth. In teeth that do not have enough enamel or have

eroded teeth, preparation may not be performed (26). Lamina veneer can be applied without preparation on the labial surfaces of lingualized teeth (27, 28).

In lamina veneer procedures, approximately 0.5 mm of preparation is made on the labial surfaces of the teeth (22-24). The amount of preparation varies according to the darkness of the teeth. In teeth with mild discoloration, preparations are made at a depth of 0.3 mm in the cervical 1/3 region and 0.5 mm in the incisal 2/3 region. This practice is called universal preparation. In heavily discolored teeth, it is considered appropriate to prepare at a depth of 0.4 mm in the cervical 1/3 region and 0.6 mm in the incisal 2/3 region. In cases where the discoloration is excessive (tetracycline discolorations and discolorations that occur after root canal treatment), preparations are made at a depth of 0.5 mm in the cervical 1/3 region and at a depth of 0.7 mm in the incisal 2/3 region (29).

Special cutting burs are used in the preparation of lamina veneers. Thanks to these burs, the preparation depth is maintained within the enamel tissue. There are four different lamina veneer preparation methods that can be preferred depending on the condition of the case (30).

#### **a) Enamel window method**

On the labial surfaces of the teeth; The preparation is made in such a way that there is 1 mm space from the incisal, mesial, distal and cervical edges. Therefore, the prepared area remains within the intact enamel tissue. In cases where acrylic resin laminate veneers are used, this method is preferred (30).

#### **b) Angleless incisal preparation method**

In this method, in which the labial surfaces of the teeth are eroded, the incisal edges are not shortened. The preparation is finished at the incisal edge (30).

#### **c) 30-40° angled incisal preparation method**

In addition to the procedures in the angleless incisal preparation method, 1.5 mm shortening is performed on the incisal edge of the teeth (30).

#### **d) Preparation method that covers the entire incisal edge and ends at the lingual of the tooth**

In this method, in which the incisal edge of the teeth is shortened by 2 mm, additionally 1.5-2 mm lingual parts of the teeth are included in the preparation (30).

#### **Cementation (Adhesion) Stage in Lamina Veneers**

Pumice is applied to the prepared tooth surfaces with the help of a polyurethane rubber or brush. Rubber dam and roll cottons are used to isolate the cleaned teeth from saliva. In order to prevent gingival fluid from leaking into the cervical part, a retraction thread should be used in the gingival part. Thin metal bands are placed to provide isolation with neighboring teeth. 30-37% orthophosphoric acid is applied to the isolated and dried tooth surface for 15-20 seconds. On the enamel surface, the washing process is carried out for 20-30 seconds and then the drying process is carried out. Adhesive agents are applied to the dried surfaces and polymerization is ensured. Appropriate restorative material is placed on the tooth surfaces where the adhesive application is completed, according to the preferred lamina veneer production method (14, 26, 29).

## **Materials Used in Lamina Veneer Production**

Different restorative materials are used in the production of laminate veneers, depending on the preferred method. In the direct method, lamina veneers are made in the patient's mouth in the same session using composite resins. In the indirect method; Indirect composite resin is used with the help of polymerization furnace or porcelain is used with the help of laboratory. In addition, lamina veneers are produced from ceramic or composite resin blocks in computer-aided design and production systems (31).

### **a) Composite resin materials**

Teeth in the anterior region; In cases of fractures and hypoplasia, lamina veneers are made with the direct method using composite resins (31). In cases with large cavity depth, composite resin is applied in several layers. Dentin composite resin (body) is used in the first layers. In the final layers, enamel composite resin is used. In this way, a restoration with properties close to enamel and dentin tissue is formed (32).

### **b) Indirect composite resin materials**

Indirect composite resins exhibit better physical and chemical properties than composite resins used in the direct method. This is explained by the exposure of indirect composite resins to heat for a certain period of time in polymerization furnaces in the laboratory (33). In addition, indirect composite resins in different systems are exposed to pressure along with heat. In this case, more polymerization of indirect composite resins is ensured. In addition, residual monomer amounts are reduced (30).

### **c) Resin-containing block materials**

In systems capable of computer-aided design/computer-aided manufacturing (CAD/CAM), different restorations are obtained by using resin-containing blocks. One of them is lamina veneer restorations. Nanoceramic fillers constitute 80% of the resin-containing block structure. These blocks, which are formed as a result of the combination of resin and nanoceramic structure, exhibit a more elastic structure compared to all-ceramic materials (34).

## **Conclusion**

With the help of resin-containing anterior lamina veneers, restorations suitable for natural tooth form and structure are obtained. However, since the polymerization of the resins applied by the direct method is not fully realized, fractures may occur in the early stages. In order to prevent this situation, lamina veneers, which are polymerized under heat and pressure and applied by indirect method, can be preferred (35). The completion process of indirect composite lamina veneers takes more time than direct composite lamina veneers (36). Lamina veneers produced with computer aided systems, on the other hand, require more cost and auxiliary personnel. As technology continues to evolve and adapt to dentistry, ideal restorations are getting closer and closer day by day.

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