PORCELAIN LAMINATE VENEERS: A MINIMALLY INVASIVE ESTHETIC PROCEDURE

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ABSTRACT: With the advancement in the area of cosmetic dentistry, the dental profession has been offered new opportunities in conservative and esthetic restorative procedures. Multiple options are available to treat problems arising in the zone of high esthetic sensitivity. The use of porcelain laminate veneers to solve esthetic and/or functional problems has shown to be a valid treatment option especially in the anterior esthetic zone. The techniques and the materials employed to fabricate porcelain laminate veneers offer satisfactory, predictable and lasting results. The current porcelain veneers are esthetically superior, conservative and durable treatment modality.
KEYWORDS: Porcelain, Veneers, Esthetics, Laminates

INTRODUCTION: Porcelain Laminate Veneer: A thin bonded ceramic restoration that restores the facial surface and part of the proximal surfaces of teeth requiring esthetic restoration.[1]

Porcelain veneers, alternatively termed dental veneers or dental porcelain laminates, are wafer-thin shells of porcelain that are bonded onto the facial surface of teeth so as to create a cosmetic improvement for a tooth.

Porcelain veneer technique utilizes the bonding capability of these materials to securely attach a thin shell of porcelain (the porcelain veneer) to a tooth. Although porcelain is inherently brittle, when it is firmly bonded to a tooth, it becomes very strong and durable.

HISTORY: Porcelain laminate veneers (PLV) were introduced into dentistry as Hollywood veneers by Pincus (1938)[12]**.** With the introduction of acid etch technique by Buonocore (1955),[2] interest was generated in PLV. Coupled with silanization of veneers and the introduction of bonded porcelain veneer by Horn (1983),[8] the results with PLV have become more predictable. Survival rates have ranged from 92% at 5 years to 64 % at 10 years (Peumans et al, 2004)[11]. Carefully placed PLV have reported very high survival rates of over 91% after 10 years stressing the need for the proper case selection and technique (Dumfahrt & Schäffer , 2000).[4]

INDICATIONS[3,6,8]:

1. Discolored teeth
2. Fractured teeth
3. Diastema closure
4. Slight malposition
5. Crown height increasing

CONTRAINDICATIONS[3,6,8]:

1. Teeth with insufficient or inadequate enamel for sufficient retention.
2. Severe crowding
3. Parafunctional habits like Bruxism, clenching

4. Large Class-IV defects should not be restored with veneers because of the large amount of unsupported porcelain and the lack of tooth-colored backing.

ADVANTAGES[6,10,13]:

1. It is very conservative in preparation. Enamel reduction of 0.5 mm or less is enough
2. Excellent esthetics: Porcelain veneers create a life-like tooth appearance
3. Excellent Biocompatibility: Tissue tolerance is excellent because of the highly glazed porcelain surface which provides less plaque accumulation
4. Porcelain veneers resist staining
5. Though the porcelain veneer is fragile, it is strong when bonded to tooth
6. The bond of the etched porcelain veneer to the enamel surface is considerably stronger than any other veneering system

DISADVANTAGES[6,10,13]:

1. The placing of veneers is technique sensitive
2. The veneers cannot be repaired once they are luted to the enamel
3. It is difficult to modify color once the veneers are luted in position on the enamel surface
4. Fragile veneer can break: Although strong when bonded to tooth, porcelain veneers are extremely fragile during try-in & cementation stages
5. Inability to trial-cement the restorations: They cannot be temporarily retained with a provisional cement for evaluation purposes
6. Expensive

Success of porcelain veneers depends on both clinical and lab procedures. Case selection and tooth preparation as required by the situation, shade selection, proper material selection and lab procedures, etching technique and good bonding materials can make the porcelain veneer last long with best appearance.

TOOTH PREPARATION[5,14]:

I. **Labial reduction:** The optimal reduction of ging ½ of labial surface is 0.3mm and for incisal ½ is 0.5mm.

Using diamond depth cutter, depth orientation grooves of 0.3mm in ging ½ & 0.5mm in incisal ½ of labial surface are placed

The tooth structure remaining between the depth orientation is removed with round-end tapered diamond while the tip of round-end diamond establishes a slight chamfer finish line at the level of gingiva

The margin should follow the gingival crest so that all discolored enamel will be removed.

II. **Interproximal extension:** The laminate preparation must be extended into the embrasure areas to ensure that the margin between the veneer and the unprepared tooth structure is hidden. This right-angled extension to the labial surface improves the strength and adhesion of the veneer. The proximal reduction should extend into contact area, but it should stop just short of breaking the contact.

III. **Incisal reduction:** There are two techniques for placement of incisal finish line.

1). The prepared facial surface is terminated at incisal edge.

2). The incisal edge is slightly reduced & the finish line terminates on lingual surface.

If possible, do not reduce the incisal edge, this helps support the porcelain & makes chipping less likely.

If incisal edge length is to be increased, the preparation should extend to the lingual

CEMENTATION PROCEDURE[3,6]:

1. Check for fit of veneer: A drop of water or glycerine will help the veneer stay in place during try-in.
2. Check for color / shade: The final appearance of veneer is affected by shade of cement used. The actual composite resin cement is placed & trial checked. The un-cured composite cement is removed by application of acetone or alcohol.
3. Ceramic veneers should be etched, silaned and bonded to underlying enamel with selected shade of dual-cured composite resin cement.
4. The ceramic veneers are etched for 1min with 5% hydrofluoric acid solution.
5. The etched surface is then treated with silane coupling agent that chemically bonds the restoration to the resin cement
6. The tooth is then etched with 37% phosphoric acid for 15-20 sec, followed by rinsing with water for 30 sec & drying with air.
7. A layer of bonding agent is cured to the etched enamel
8. The selected color of luting composite is coated onto the laminate veneer & seated with finger pressure.
9. Excess cement is removed, & curing is done for 1min with curing light.

THE FUTURE OF PORCELAIN LAMINATE VENEERS: The introduction of new dental technology combined with changing patients attitude, is slowly altering dentistry's approach to esthetic problems.

The patients acceptance of the porcelain laminate veneer technique now-a-days seems to be high. A study conducted by Goldstein and Lancaster[7] showed that patients would readily accept shorter restoration life expectancy (five to eight years) if enamel could be saved by not reducing the tooth for a full crown.

The technique is expected in the near future to be drastically simplified. Clinical researches to date has shown excellent retention rates. The introduction of high strength dentin bonding agents and reliable resin cements will accelerate the progression towards bonded porcelain used in clinical practice.[9]

On the other hand long-term study of porcelain veneers is required in order to study their marginal integrity, marginal staining and their effect on gingival tissues.

Finally, we believe that the advantages of this technique as a treatment modality make it worthy of serious consideration in view of the distribution and prevalence of certain dental problems confronting the general practitioner.

CONCLUSION: Bonded porcelain veneers can provide successful esthetic and functional long-term service for the patients. Porcelain laminate veneers offers more extensive applications when they are used cautiously and the results achieved have been gratifying for the dentist and the patient

alike. It has become increasingly apparent that conservation of tooth structure is a major factor in determining the long-term prognosis of any restorative procedure.

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