



# INTERNATIONAL JOURNAL OF ADVANCE RESEARCH, IDEAS AND INNOVATIONS IN TECHNOLOGY

ISSN: 2454-132X

Impact factor: 4.295

(Volume3, Issue5)

Available online at [www.ijariit.com](http://www.ijariit.com)

## Veneers: Modern Approach of Dentistry-A Review

**Dr. Raisa Rashid**

<sup>1</sup>Resident, Prosthodontics

Government Dental College, Srinagar, Jammu & Kashmir

[raisa777.rb@gmail.com](mailto:raisa777.rb@gmail.com)

**Dr. Waseem-ul- Ayoub**

<sup>1</sup>Resident, Prosthodontics

Government Dental College, Srinagar, Jammu & Kashmir

[waseemayoub007@gmail.com](mailto:waseemayoub007@gmail.com)

---

**Abstract:** A captivating smile showing an even row of natural, gleaming white teeth is a major factor in achieving that elusive dominant characteristic known as personality. An individual can achieve this person with a warm, vibrant and friendly smile. With advances in science and technology in the field of esthetic dentistry. Porcelain laminate veneers have worked wonders to the victims of unaesthetic and discoloured teeth. Veneers provide the most conservative technique of improving the appearance, modifying contour, restoring enamel defects, masking discoloration and closure of diastema. The conservation of sound tooth structure helps to preserve the tooth vitality and reduces postoperative sensitivity. The porcelain veneers are one of the most aesthetic, durable conservative and biocompatible anterior restorations. They consist of a thin layer of porcelain that is directly bonded to the labial surface of the tooth structure.

**Keywords:** Porcelain, Laminate, Esthetics, Diastema, Biocompatible.

---

### INTRODUCTION

Porcelain veneers are used to modify the shape and colour of teeth, and they are the treatment of choice for teeth that are relatively intact but may be misshapen, discoloured, or chipped. Veneers are thin shells of porcelain that are internally etched and then bonded to the enamel of the teeth. This ultra-thin resin-retained ceramics significantly reduce the periodontal and pulpal jeopardy often associated with crown procedures while offering excellent aesthetic appearance<sup>1</sup>. A small amount of tooth structure must be removed to make room for the porcelain veneer and to avoid making the tooth look big and bulky. The tooth preparation is limited to the enamel and usually involves only a few surfaces of the tooth, unlike a crown or cap. A prosthodontist uses porcelain veneers to improve the appearance of teeth and to even close spaces or gaps between teeth. The porcelain laminate veneers have largely replaced the resin veneer because of the poor clinical performance of resin restorations. Resin composite veneers may provide only 4 to 5 years of service before they actually require replacement. Porcelain is biocompatible, aesthetically pleasing, and resistant to stains and wear. With the advent of new bonding techniques, porcelain veneers have proven to be very reliable.<sup>2</sup>

### HISTORY

Veneers were invented by California dentist Charles Pincus<sup>3</sup> in 1928. Later, in 1937 he fabricated acrylic veneers to be retained by denture adhesive, which was only cemented temporarily because there was very little adhesion.

In 1959 Dr. Michael Buonocore introduced the concept of acid etching technique which provided a simple method of increasing the adhesion to enamel surfaces.

Research in 1982 by Simonsen and Calamia<sup>4</sup> revealed that porcelain could be etched with hydrofluoric acid, and bond strengths could be achieved between composite resins and porcelain that were predicted to be able to hold porcelain veneers onto the surface of a tooth permanently.

This was confirmed by Calamia<sup>5</sup> in an article describing a technique for fabrication, and placement of Etched Bonded Porcelain Veneers using a refractory model technique and Horn<sup>6</sup> describing a platinum foil technique for veneer fabrication. Additional articles have proven the long-term reliability of this technique.<sup>7,8,9,10,11,12,1,14,15</sup>

Today, with improved cement and bonding agents, they typically last 10–30 years. They may have to be replaced at this time due to cracking, leaking, chipping, discoloration, decay, shrinkage of the gum line and damage from injury or tooth grinding. The cost of veneers can vary depending on the experience and location of the dentist. Porcelain veneers are more durable and less likely to stain than veneers made of composite.<sup>16</sup>

## **DEFINITION** (From Wikipedia)

In dentistry, a veneer is a layer of material placed over a tooth, veneers improve the aesthetics of a smile or and protect the tooth's surface from damage. There are two main types of material used to fabricate a veneer: composite and dental porcelain.

**GPT 8** defines veneer as

- A thin sheet of material usually used as a finish, a protective or ornamental facing a superficial or attractive display in multiple layers, frequently termed a laminate veneer.
- A thin bonded ceramic restoration that restores the facial surface and part of the proximal surfaces of the teeth requiring esthetic restoration.

## **CLASSIFICATION** <sup>17,18</sup>

1. Direct veneers
- Composite veneers
2. Indirect veneers
- Porcelain veneers
3. Composite veneers
- Acrylic veneers

## **ADVANTAGES**

1. Excellent esthetic<sup>1</sup>
2. Excellent long-term durability <sup>19</sup>
3. Inherent porcelain strength
4. Marginal integrity <sup>20,21,22</sup>
5. Soft tissue compatibility<sup>23,24</sup>
6. Minimal tooth reduction <sup>25,26</sup>

## **DISADVANTAGES**<sup>27</sup>

1. Fragility
2. Cost
3. Difficulty
4. Time
5. Loss of repairability
6. Irreversibility
7. Difficulty in color matching
8. Inability to trial cement the restoration
9. Technique sensitive
10. Critical tooth preparation.

## **INDICATIONS**

The first important parameter for long-term success of porcelain veneer is case selection.<sup>28</sup> The prime requirements in case selection are a high standard of oral hygiene and health and presence of an adequate area of sound enamel available for etching. Among the main reasons for placing veneer are:

- correction of unaesthetic surface defects such as hypoplastic enamel or enamel lost by erosion<sup>29,30</sup> or abrasion
- masking of discoloration resulting from trauma
- endodontic treatment
- tetracycline stains
- Repair of structural deficiencies such as fractured incisal edge,<sup>28</sup>diastema <sup>31</sup>and peg laterals.

## **CONTRAINDICATIONS**

A decreased success<sup>32</sup> is seen when porcelain veneer is restored in teeth:

- With inadequate enamel and tooth structure such as amelogenesis and dentinogenesis imperfect
- When there are existing large restoration or root canal treated teeth with less tooth structure
- Patient with oral habit <sup>33</sup>causing excessive stress on restoration and excessive interdental spacing.

## **CLINICAL TECHNIQUE FOR TOOTH PREPARATION AS PER GARBER.**<sup>27</sup>

1. Administer suitable anesthesia (if necessary).
2. Prepare three horizontal surface depth cuts in the labial surface with a friction grip three-tiered LVS-1or LVS-2 depth cutting diamond (Fig 1-a & b). Depth cuts should be 0.5 to 0.7 mm deep for "ideal" teeth, and 0.3 mm deep for mandibular incisors. Lingually positioned teeth and those with thin enamel require less reduction.
3. Prepare three incisal depth cuts with an LVS-.3 or LVS-4 diamond bur (Figs.1-h and1-i). (The incisal reduction should create a preparation that is 1 mm shorter than the desired final restoration.)
4. Using the depth cut as a guide, prepare the incisolingual finishing line to a modified butt joint with the diamond wheel bur (Figs1-j and k). The labioincisolingual angle should be approximately 75 degrees.
5. Using the depth cuts as a guide, prepare the labial surface with an LVS-3 or LVS-4 diamond bur (Figs.1-m and n).
6. Prepare the proximal chamfer finishing lines.

Fig.1-Three horizontal depth cuts are prepared on the labial surface

Fig.1-b .When the three-tiered depth-cutting bur is held tangentially to the surface of the tooth, only the middle section of the bur penetrates to its entire depth.

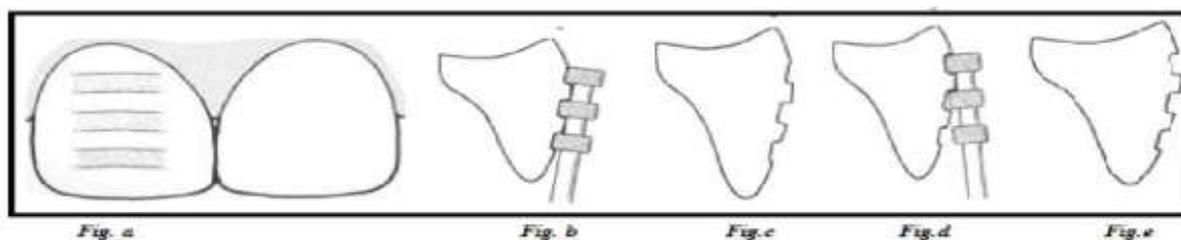


Fig.1-c. Only the middle section of the tooth is prepared to the full depth because of the convex labial surface. The incisal and gingival portions of the tooth are underprepared.

Fig1-d.The bur is angled a second time to complete the gingival depth cut.

Fig 1-e. The tooth after two depth cuts. The incisal portion of the tooth remains underprepared.

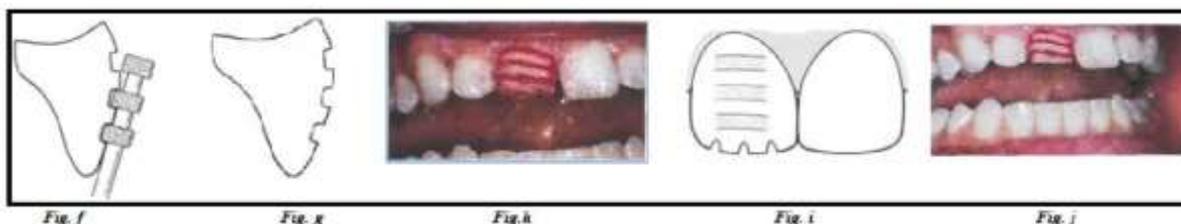


Fig1-f. The bur is angled for the third time to complete the incisal depth cut.

Fig1-g. The three depth cuts are equally deep.

Fig1-h. Three vertical depth cuts are prepared in the incisal edge.

Fig1-i. Three vertical depth cuts are prepared in the incisal edge.

Fig1-j. The incisolingual finishing line was prepared to a modified butt joint using the depth cut as a guide.



Fig 1-k. An incisal butt joint angled approximately 75 degrees from the labial provides for the adequate thickness of porcelain at the margin and resistance to displacement of the restoration.

Fig 1-l. To prevent overproduction, pencil lines can be drawn into the prepared enamel guide cuts.

Fig1-m.The labial surface is prepared using the horizontal depth cuts as a guide.

Fig1-n. The labial surface is prepared using the horizontal depth cuts as a guide

## GINGIVAL DISPLACEMENT AND IMPRESSION TECHNIQUE

Gingival retraction is usually needed for maxillary teeth and dark teeth. Infiltration over the teeth with the local anesthetic solution is also advised. A single cord is used which remains in place when the impression is being made and no extra hemostatic agent in the cord is needed because bleeding should be minimal with healthy gingivae.

IMPRESSION TECHNIQUE: Elastomeric impression material is suitable for recording the preparation. If the preparation is limited to maxillary anterior teeth, an anterior stock tray is adequate. However, an alginate impression is suggested prior to preparation so that the custom tray is fabricated. A special tray is extended 5 mm gingival from gingival margin and cover half of palatal surface, adjacent unprepared teeth, and occlusal stop. When lower anterior teeth are prepared, it is necessary to have a custom tray of entire mandibular arch.<sup>34,35</sup>

## PROVISIONAL RESTORATION

Patients seldom experience sensitivity so a temporary cover may be omitted. But, if temporary restoration is needed then the materials used are performed acrylic resin veneer and composite resin. Temporary veneer under functional stress may be “spot welded” for better retention<sup>36</sup>

## LABORATORY PROCEDURE

Today following groups of ceramics are used for veneer:

- Conventional (powder- slurry) ceramics
- Castable ceramics
- Machinable ceramics
- Pressable ceramics
- Infiltrated ceramics

## **TRY IN**

The veneers are fragile and should be handled with care. Inspect veneer for any crack and imperfection on the model for an appropriate fit, then remove provisional with a hemostat, and pumice all areas of prepared surface<sup>37</sup> Moisten the teeth and the internal surface of porcelain with water and place on teeth and evaluate fit and color. Adjustment is made with a fine diamond bur and verified.

## **BONDING PROCEDURE**

There are 3 basic ways of attaching porcelain laminates to the surface of teeth.

- Chemical attachment: Cement (light activated composite and coupling agent)
- Micromechanical attachment: Acid etching
- Combined attachments.

## **PROCEDURE**

The teeth are isolated with cotton, lightly repolished, and washed. The selected tooth is separated from its neighbours by mylar strips, etched for 60 s, washed, and dried. The light-cure bonding agent is applied to etched enamel and excess blown off. The selected shade of cement is placed evenly on the porcelain to cover the whole fitting surface without trapping air. A 10 s spot cure of the cement labio-incisally, after the veneer has properly positioned, permits removal of the unset excess elsewhere before final curing.

On completion of placement excess cured cement is removed with fine, water-cooled diamond and interproximal clearances confirmed with fine separating strips.

Excessive stress on newly placed veneer should be avoided as it takes 24 h for the coupling agent to develop its maximum bond strength. Final polishing is much better delayed to later visit.

## **PATIENT MAINTENANCE**

The teeth should be professionally cleaned 3-4 times yearly. Hygienist should be warned not to use ultrasonic scaling or air abrasive. These procedures will prolong the life of veneers.<sup>38</sup>

## **FAILURES**

The survival probability of porcelain veneers according to the Kaplan - Meier survival estimation method was 97% at 5 years and 91% at 10½ years<sup>39,40</sup>

## **CONCLUSION**

New emerging concepts in esthetic dentistry with regards to materials technology and public awareness have made veneers on demand. The porcelain veneer is very esthetic and conservative treatment option for many indications. The success of porcelain veneer depends very much on the method of fabrication and most important case selection. The research in this field has been based on personal preference and anecdotal information, more objective research is required so that porcelain veneer will become better successful.

## **REFERENCES**

1. Mark JF. Augmenting restorative dentistry with porcelain veneers. J Am Dent Assoc 1991; 122:29-34.
2. Gregory JW, Resnick MH, Johnson WM. Incisal edge strength of PLVs restoring mandibular incisors. Int J Prosthodont 1992; 5: 441-446.
3. Pincus CL. "Building mouth personality" A paper presented at California State Dental Association; 1937: San Jose, California
4. Simonsen R.J. and Calamia John R. "Tensile Bond Strengths of Etched Porcelain", Journal of Dental Research, Vol. 62, March 1983, Abstract #1099.
5. Calamia John R. "Etched Porcelain Facial Veneers: A New Treatment Modality Based on Scientific and Clinical Evidence", New York Journal of Dentistry, Vol. 53, #6, Sept./Oct. 1983, pp.255-259.
6. Horn HR. "A new lamination, porcelain bonded to enamel". NY St Dent J 1983;49(6):401-403
7. Calamia John R. and Simonsen R.J. "Effect of Coupling Agents on Bond Strength of Etched Porcelain", Journal of Dental Research, Vol. 63, March 1984, Abstract #79.
8. Calamia John R. "Etched Porcelain Veneers: The Current State of the Art", Quintessence International, Vol. 16 #1, January 1985.
9. Quinn F Mc Connell RJ "Porcelain Laminates: A review", Br Dental J. 1986;161(2):61-65
10. Calamia John R. "Clinical evaluation of etched porcelain veneers" Am J Dent 1989;2:9-15
11. Nathanson D, Strassler HE. Clinical evaluation of etched porcelain veneers over a period of 18 to 42 months J Esthet Dent 1989;1(1):21-28
12. Strassler HE, Weiner S "Long-term clinical evaluation of etched porcelain veneers" J Dental Res 77 (Special Issue A):233 Abstract 1017,1998
13. Friedman, MJ "A 15-year review of porcelain veneer failure- a clinicians' observations. Compend Contin Educ Dent. 1998;19 (6):625-636.
14. Calamia John R. "Etched Porcelain Laminate Restorations: A 20-year Retrospective- Part 1" AACD Monograph Vol II 2005:137-145 Montage Media Publishing

15. Barghi, N, Overton JD "Preserving Principles of Successful Porcelain Veneers" *Contemporary Esthetics* 2007;11(1)48-51
16. Calamia John R., Calamia Christine S. Porcelain Laminate Veneers: Reasons for 25 Years of Success, Successful Esthetic and Cosmetic Dentistry for the Modern Dental Practice, *Dental Clinics of North America*. April 2007 Vol 51 No. 2 Calamia, Wolff, Simonsen Saunders/Elsevier, Inc., Veneers by Calamia, Enamelique.com [1]
17. Galip Gurel: The science and art of porcelain laminate veneers *Quintessence Int*;2003:30-33
18. David AC, Fernando CG. Selecting an esthetic veneering technique. *Quintessence Int* 1987;18:247-52
19. Magne P, Belser U. Bonded porcelain restoration in the anterior dentition: A biomimetic approach. Chicago: *Quintessence*;2002:129-382
20. Tay WM, Lynch E, Auger D. Effects of some finishing techniques on cervical margins of porcelain laminate. *Quintessence int* 1987; 18:599-601.
21. Aldon ML, Craig W, Larry W. In vitro microleakage at the gingival margin of porcelain and resin veneers. *J Prosthet Dent* 1992; 67:7-10.
22. Herbet D. Porcelain laminate veneers A retrospective evaluation after one to ten years of service. *Int J Prosthodont* 2000; 13:9-18.
23. Kourkata S, Walsh TF, Davis LG. The effect of porcelain laminate veneers on gingival health and bacterial plaque characteristics. *J Clinical Periodont* 1984; 21:638-640.
24. David JP, James NM, Anton PS. Clinical evaluation of restored maxillary incisors Veneers v/s PFM crowns. *J Am Dental Assoc* 1995; 126:1523-1528.
25. Cherukara GP, Seymours, Samaraviprama DYD. A study into the variations in the labial reduction of teeth prepared to receive porcelain veneers –a comparison of three techniques. *Br Dent J* 2002; 192; 401-404.
26. Daniel E, Med D, John A S. Tooth structure removal associated with various preparation designs for an anterior tooth. *J Prosthet Dent* 2002; 87: 503-509.
27. Garber .A.D, Goldstein .R: Porcelain laminate veneers .*Quintessence* 1988:11-76.
28. Lim CC. Case selection for porcelain veneers. *Quintessence Int* 1995; 26:311-5.
29. Ried JS, Simpson MS, Taylor GS. Using porcelain veneer to treat eroded teeth. *Dent Abstr* 1991; 36:225-56.
30. Walls AW. The use of adhesively retained all-porcelain veneers during the management of fractured and worn anterior teeth: Part 1. Clinical Technique. *Br Dent J* 1995; 178:333-6.
31. Hunt NP. Hypodontia – Problems of permanent space closure. *Br J Orthod* 1985;12:149-52
32. Malone WF, Tylman SD, Koth DL. Tylman's Theory and Practice of Fixed Prosthodontics. 8th ed. St Louis: Ishiyaku Euro-America; 1989.
33. Heyde JB, Cammarato VT Jr. A restorative system for the repair of defects in anterior teeth. The laminate veneers. *Dent Clin North Am* 1981; 25:337-45.
34. Dumfahrt H. Porcelain laminate veneers. A retrospective evaluation after 1 to 10 years of service: Part I – Clinical procedure. *Int J Prosthodont* 1999; 12:505-13.
35. McIntyre FM. Placement of retraction cord during porcelain laminate (veneer) restorative procedures. *J Prosthet Dent* 1993;70:97.
36. Shillingburg HT, Hobo S, Whitsett LD, Jacobi R, Brackett SE. *Fundamentals of Fixed Prosthodontics*. 3rd ed. Chicago: Quintessence Publishing Co, Inc.; 1997.
37. Clyde JS, Gilmour A. Porcelain veneers: A preliminary review. *Br Dent J* 1988;164:9-14.
38. Goldstein RE. *Change Your Smile*. 3rd ed. Indian edition. Chicago: Quintessence Book; 1997.
39. Dumfahrt H, Schäffer H. Porcelain laminate veneers. A retrospective evaluation after 1 to 10 years of service: Part II – Clinical results. *Int J Prosthodont* 2000;13:9-18.
40. Strassler HE, Weiner S. Seven to ten-year clinical evaluation of etched porcelain veneer. *J Dent Res* 1995; 74:176.