

CASE REPORT



Esthetic rehabilitation of anterior teeth with porcelain veneers - A case series

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Abstract

Porcelain laminate veneers are most conservative and esthetic treatment option for enhancing anterior esthetics. The success of veneers is mainly based on careful and controlled tooth reduction within the biological and mechanical principles of natural dentition. Laminate is viable conservative technique when compared with full crowns. Tooth colored thin layer material is placed on the prepared surface of the tooth for esthetically restoring small or large defects or intrinsic discoloration. Laminates are indicated in cases of fracture, discoloration, spacing, chipped enamel surfaces, etc. This article presents a series of three cases - (1) spacing between teeth, (2) fracture of teeth, and (3) discoloration of teeth. Porcelain laminates were planned for these cases. A step-by-step protocol was followed for fabrication of laminate veneers.

Keywords: Conservative preparation, esthetics, laminates, porcelain**Introduction**

Natural smile is the most gorgeous asset of a person's life. With the development of social media and selfies, people have become more conscious about the beauty of smile. Discolored, unsightly, malposed, malformed anterior teeth, and midline diastema can make the individual psychologically depressed and socially less active. Restoring teeth of such person may produce a drastic change and development of self-confidence in them.

With the evolution of new techniques and adhesive systems, minimum thickness porcelain laminates are useful conservative treatment option.^[1] They are used when there is adequate sound tooth structure present and is indicated in cases of discoloration, midline diastema, fractured tooth, malposed teeth, etc. In such cases, the tooth is vital and adequate enamel structure is present for tooth preparation. For achieving successful results integrity of dental tissues to which veneers will be bonded plays a key role. 0.3 mm and 0.5 mm reduction is adequate on enamel surface, and with this 95% of enamel, preservation is possible without exposure of dentin.^[2,3] To preserve tooth structure, it is necessary that the preparation should lie within enamel, so careful control of preparation depth is important. The depth of preparation near gingival margin is 0.4 while it is 0.7 in other areas. Incisal reduction with palatal extension is required in certain cases as it prevents extensive tooth preparation and creates a constructive

seat for luting cement. This technique helps to alter the path of insertion of the veneer to buccal/incisal direction rather than the buccal alone. To camouflage tooth discolorations and/or to correct unesthetic conditions composite resin can also be used. However, such restorations provide limited longevity with short-term results as they get stained by external agents or chip of easily.^[4,5] In this way, the use of laminated veneers is strongly indicated to restore or even promote the harmony of the smile.

Case Report**Case 1**

A 27-year-old female patient reported in the department of prosthodontics with the chief complaint of poor esthetics due to the spacing between teeth. The patient was depressed with the appearance of her teeth and prevents herself from smiling. Detail medical and dental history was obtained. On extraoral examination, no abnormal findings were seen. Intraoral examination revealed spacing between the maxillary left and right central and lateral incisors (11, 12, 21, 22) and mandibular right lateral incisor and canine (42, 43). No abnormal finding was found on clinical and radiographic examination [Figure 1a and 2a]. Various treatment options available were full coverage zirconia or porcelain-fused-to-metal crowns, composite veneers, and porcelain veneers. As

full crown requires more tooth reduction, it was eliminated. Composite veneers are not much durable and do not provide longevity, so it was also eliminated. Due to the least invasive nature and brilliant esthetic qualities of laminates, it was decided to use porcelain laminate veneers for enhancing patients smile.

Procedure

- Diagnostic impressions of maxillary and mandibular arches were made using alginate impression material (dentsply vignette chromatic alginate), and casts were poured (type II gypsum).
- The cast was mounted on a semi-adjustable articulator with facebow transfer and maximum intercuspation using an intraoral record. Mockup was done to have an esthetic idea about the prosthesis.
- 0.3 mm–0.5 mm depth orientation grooves were made on the facial and incisal half surface of the tooth with wheel diamond depth cutter, respectively, on 11, 12, 21, and 22 and 32 and 33. The depth grooves were connected with each other, and tooth structure in between was removed with a round end tapered diamond. Incisal edge was reduces 0.5 mm and preparation was extended palatally to enhance esthetics. Subgingival chamfer finish line was placed in the maxillary anterior teeth. Retraction cord was placed for gingival retraction (Medi-Pak000 knitted non-impregnated India) [Figure 1b and c]. Final impressions were made with elastomeric impression material (Silagum DMG Germany), and master casts were poured (type IV gypsum).
- Provisionals were cemented (Luxatemp Ultra DMG Germany) [Figure 1d]
- IPS-e.max porcelain veneer was made after casting procedure. Try it was done to check for shade, shape, and fit of veneers.
- Internal surface of porcelain veneer was etched with 9.5% hydrofluoric acid (Angelus Brasil etching gel) for 20 s [Figure 3b]. Then, it was washed with water and dried with air. After that, a layer of silane coupling agent (3M ESPE RelyX™) was coated on the internal surface of veneer and was allowed to dry for 1 min. The area was then light-cured [Figure 3b].
- Tooth surface was etched with 37% phosphoric acid, and dentin bonding agent was applied [Figure 3a].
- Laminates were cemented and cured with LED curing unit for 20 s [Figure 2b, c and 3c]. Patient was given post-operative instructions.

Case 2

A 32-year-old female patient reported in the department of prosthodontics with the chief complaint of poor esthetics due to Elli's Class II fracture. A complete medical and dental history was obtained. There were no abnormal findings on extraoral examination. Ellis Class II was seen with 21 and spacing was seen between 11, 12, 21, and 22. As composite restorations stain easily and are not long-lasting, it was not considered. Porcelain veneers were planned with 11, 12, 21, and 22 [Figure 4a].



Figure 1: (a) Pre-operative, (b and c) tooth preparation, (d) provisional restoration



Figure 2: (a) Pre-operative (before), (b and c) final restoration (after)

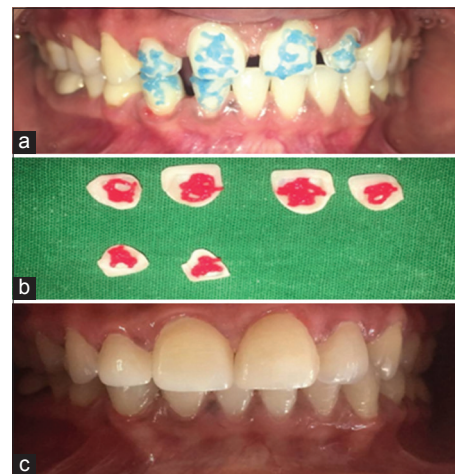


Figure 3: (a) Etching with 37% phosphoric acid, (b) 9.5% hydrofluoric acid, (c) final restoration

Procedure

- Impression procedure is followed as described above.
- Tooth preparation was done as described in the above procedure. Laminates were cemented in mouth and patient was given post-operative instructions [Figure 4b-d].

Case 3

A 28-year-old female patient reported in the department of prosthodontics with the chief complaint of poor esthetics due to discoloration of anterior teeth. Discoloration was seen with 11, 12, 21, and 22 [Figure 5a]. AS 11 and 21 were nonvital and root canal treated, full coverage zirconia crowns were planned with 11 and 21 and minimally invasive treatment of porcelain laminates was planned with 12 and 22.

Procedure

- Impression procedure is followed as described above.
- The cast was mounted on a semi-adjustable articulator with facebow transfer and maximum intercuspation using an intraoral record. Mockup was done to have an esthetic idea about the prosthesis.
- Tooth preparation was done for full coverage with shoulder margin labially and lingually. Tooth preparation was done as described in the above procedure for laminates on 12 and 22 [Figure 5b].
- IPS-e.max veneers trial was done with 12, 13, 22, and 23 and layered zirconia crowns bisque trial was tried with 11 and 21.
- Zirconia crowns were cemented with resin cement, and laminates were cemented as per above procedure [Figure 5c and d].



Figure 4: (a) Pre-operative (before), (b-d) final restoration (after)



Figure 5: (a) Pre-operative (before), (b) tooth preparation, (c and d) final restoration (after)

Discussion

Ceramic restorations are commonly used to treat unesthetic conditions. According to various studies, ceramic restorations provide survival rate for >10 years.^[1,6-8] Loss of natural teeth esthetics is dramatic for patients; hence, conservative approach for establishment of esthetics is the best possible care provided to the patient. According to the literature esthetic correction of unesthetic problems with laminates is a better choice over full coverage restorations.

Laminates are indicated in cases with discolored teeth which cannot be treated with bleaching procedures, unpleasant shapes of teeth, midline diastema, teeth in need for morphologic modifications, misaligned teeth, enamel malformations, fluorosis, tetracycline stains, and fractured teeth.^[4,9-11] Contraindications and limitations of laminates must also be recognized. Placement of laminates should be avoided in deep bite cases, reduced interocclusal space, bruxism, and other parafunctional habits.

As composite restorations get stained easily and are not durable, it is not considered as a treatment plan. Laminates require conservative tooth preparation; hence, it was considered over composite restorations. Laminates have properties of optical sensitivity and color stability; they are less porous and have high crystalline structure. Lateral and incisal guidance is properly supported by these properties.^[1]

Laminate restoration is technique sensitive; it requires a skilled operator for good esthetic results and success of treatment. Proper tooth preparation with proper placement of finish line and utmost care at try in and cementation of laminates can bring esthetically acceptable results. Advancement in the technique, ceramic and luting media made it the most preferred treatment option instead of full coverage restorations for esthetic corrections. For successful results, the patient should be educated about oral hygiene measures and should be motivated enough to maintain the restorations. Long-term success of the rehabilitation depends on the skills of operator and hygiene maintained by the patient.

Conclusion

An unpleasant tooth is the main indication of porcelain veneer. This treatment presents many advantages. It is a viable conservative technique when compared with removal of sound tooth structure that is required for full crowns. It is biocompatible, color stable and gives life-like vital appearance.

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