



Chuckling Smile: Ceramic Veneer

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Authors' contributions

This work was carried out in collaboration between all authors. Author JJ has done the work whereas authors RC, TKG, SS, MM, ST, HR and SJ helped in writing and editing. All authors read and approved the final manuscript.

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Case Study

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ABSTRACT

Smiling is not a simple option in those patients who have a severe aesthetic deformity. Many definitions of aesthetics were introduced in dentistry but according to Young, beauty, harmony, naturalness and individuality are the major qualities of aesthetics. The dentist must visualize aesthetics in relation to the patient and then translate that visualization into an acceptable aesthetic result. The success of his efforts depends upon his artistic ability, his powers of observation and experience. Many treatment options are available to achieve aesthetics in compromised anterior teeth but in recent era with the introduction of advanced material (new ceramic and composite materials) has increased the demand of conservative treatment options. Porcelain laminate Veneers (PLVs) were introduced in the 1980s as an alternative to full-coverage crowns. The present case report describes the treatment of fracture & diastema in the anterior dentition with thin ceramic veneers, to restore esthetics and function.

Keywords: Porcelain laminate veneers; discolourations; CAD/CAM, aesthetic.

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1. INTRODUCTION

The demand for the treatment of unaesthetic anterior teeth is gradually increasing. There are the various factors which causes the appalling smile like midline diastema, spacing, discolouration etc. Several treatment options are available to restore the aesthetics of tooth like Porcelain laminate Veneers (PLVs), metal ceramic crown and full ceramic crown. Full coverage crowns have been applied as the most predictable treatment option for the correction of unaesthetic anterior tooth for a long time but this approach is invasive with unnecessary removal of large amount of sound tooth structure and possible adverse effects on adjacent pulp and periodontal tissues.

With the introduction of self etch adhesive systems [1,2] along with high performance universally applicable small particle hybrid resin composites leads to develop a conservative restorative technique called as veneer. Veneers are thin pieces of material, used to recreate the natural look of teeth, and a very successful option in many situations where the original tooth has developed poor colour, shape, and contour. It is also a good choice for fractured teeth, gaps between teeth, minor bite-related problems and in some situations where the tooth position is compromised. Commonly used materials for veneer preparation are resin composite and ceramic. Resin composite veneers can be used to mask tooth discolorations and correct unaesthetic tooth forms and positions, but such restorations still suffer from a limited longevity, because of the resin composite materials are susceptible to discoloration, wear and marginal fractures and reducing the aesthetic outcome in the long term [3,4]. In contrast, ceramic veneers provide the strength and resilience comparable to natural tooth enamel, great bonding capability, excellent aesthetics, correct multiple flaws like discolouration, staining, chipped and fractured tooth and also the material of choice for those situation in which patient wants to make slight position alterations, change tooth shape, size and color. It is also indicated in those situations in which metal ceramic crowns are difficult to place like –large pulp chambers in young permanent teeth, mandibular incisors and occlusal limitations [4].

2. CASE PRESENTATION

A 20 years old male patient reported to the clinic with chief complaint of fractured maxillary

anterior tooth with spacing (Fig. 1). On examining the vitality of tooth, it was found vital on electronic pulp tester, no discoloration nor tenderness on percussion was observed. Patient wanted to improve his aesthetic appearance. The patient had received a composite restoration earlier but he was not satisfied. The improvement of the aesthetic appearance of the patient by using PLVs with incisal overlapping in maxillary anterior teeth was planned. Anesthesia was required during the preparation of the teeth because patient feels pain while the preparation approach to cervical level. Enamel became thinner and tissue retraction was required to dilate the intracrevicular space to observe the CEJ and to avoid laceration of gingival tissue. Tooth preparation was performed with depth guide grooves. Incisal reduction was done with placing notches in incisal edge in 3 parallel position with LN™ Tungsten Steel Burs (Dentsply Maillefer Ballaigues, Switzerland). Incisal preparation was modified to get incisal wrap because incisal edge is fractured. Facial surface was uniformly reduced with the fine diamond bur to the peripheral margins and labial depth guides. The margin was continued with interproximal areas to the height of labiopalatal contours to avoid display of cement. The preparation was progressively polished with compomaster finishing and polishing kit (Shofu dental corporation, Kyoto, Japan) to remove contour irregularities, internal line angles, and bur striations to minimize stress to thin porcelain veneer (Fig. 2). Gingival chamfer was placed at the height of gingival crest using a coarse tapered diamond bur. Wash impression was recorded using elastomeric impression material (Express™ VPS Impression Material-3M ESPE) using a combination of putty and light body (Fig. 3). The preparation and inter proximal embrasures were cleaned. Lithium disilicate ceramic was used for preparation of PLVs by using CAD/CAM system. Seating of veneer was tested with the help of glycerine and checked for colour, fit and placed simultaneously to check for displacement from bulky proximal contacts. Excess proximal contacts were relieved using abrasive polishing wheels (Scotch-Brite™ Wheels - 3MAbrasive Systems). Occlusal analysis was done with semiadjustable articulator in both centric or eccentric contact. The prepared tooth surface was etched using 37% phosphoric acid (Ivoclarvivadent, Australia) for 45 seconds, rinsed and dried. Intaglio surfaces of the laminates etched with 9.6% hydrofluoric acid (porcelain etch gel, United Kingdom) for a minute. Laminates were placed in a ultrasonic

cleaner with the solution of acetone and alcohol to remove contaminants. They were then rinsed dried and arranged in left and right contralateral pairs, beginning with the centrals then placed dental cement (SmartCem[®]2 Self-Adhesive Cement- Dentsply International, Ballaigues, Switzerland) on the veneers intaglios and affixes the porcelain on the front of the teeth. As stated above, the color of cement is specifically chosen to coordinate with the veneers and match the natural color of a patient's smile. After applying a gentle force to set the porcelain in place, the dentist uses a curing light to harden the cement (Fig. 4,5). The light stimulates a chemical reaction in the bonding agent and takes a minutes to set. Recall after 3 month patient was asymptomatic with no sign of discomfort.



Fig. 1. Pre operative view



Fig. 2. After preparation of veneer



Fig. 3. Impression after veneer preparation



Fig. 4. Post operative view after cementation of veneer



Fig. 5. Post operative view

3. DISCUSSION

Porcelain laminate veneers are thin, custom made shells of tooth colored materials which cover the front surface of teeth and improve the appearance by correcting imperfections like discolorations, chipping & crowding teeth. Minimum preparation of the tooth is required to reduce the level of discomfort. Ceramic has a good choice of material for veneer because it has minimum thickness of 0.3 to 0.5 mm and it provides a great colour stability and translucency. They have relatively high wear resistance without compromising optical properties [5]. Durability of ceramic veneer is very high approximately 10-15 year but there are some risk and complication like they could be fractured, debond and damaged. Ceramic veneer are resistant to stain like tea & coffee, smoking and soft drinks and the gum also respond well to porcelain margin and easy to keep clean. Different materials could be used to fabricate veneers: feldspathic ceramics [6], hybrid composites [7], or high-density ceramics (alumina, glass-infiltrated zirconia, zirconia) [8]. Recently, the CAD/CAM processed veneer provide greater stability and translucency which improve the esthetics and gives a natural look &

also completed the procedure in same day [9,10]. On the other hand, there are some disadvantages in ceramic veneer like cost and bonding to dentin. Cost of ceramic veneer is very high in comparison to composite veneer and the bond become weak when the preparation goes in to the dentin.

4. CONCLUSION

PLV provides the strength and resilience comparable to natural tooth enamel, great bonding capability to bond both enamel and dentin, excellent esthetics, correct multiple flaws like discoloured, stained, chipped and fractured teeth and also the material of choice for those situation in which patient wants to make slight position alterations, change tooth shape, size, and color. The periodontal response of porcelain veneers is excellent and patient satisfaction is high.

CONSENT

All authors declare that written informed consent was obtained from the patient (or other approved parties) for publication of this paper and accompanying images.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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