

An Esthetic Application of Lithium Disilicate Porcelain Veneer for Replacing a Missing Maxillary Central Incisor

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How to cite the article:

Jain A, Ponnappa KC, Yadav P, Rao Y, Yadav BK, Relhan N, Gupta P. An aesthetic application of lithium disilicate porcelain veneer for replacing a missing maxillary central incisor. J Int Oral Health 2015;7(10):1-3.

Abstract:

Porcelain laminate veneers have passed the boundaries of exclusive practitioners, specialist, and the esthetic centers all over the world. The advent of acid etch technique, dentine bonding agents, and esthetic restorative materials have increased the scope of veneers. The clinical and laboratory advantages of proximal veneer extensions for anterior teeth significantly outweigh the disadvantage of increased tooth structure removal. This case reports highlights the improvement of esthetics in upper anterior teeth with porcelain veneer. Space analysis of the anterior dentition showed that no tooth rearrangement was needed, and shape transformation was sufficient for esthetics. Through transforming tooth shape with porcelain laminate veneers, the maxillary left lateral incisor was transformed into central incisor.

Key Words: Esthetic rehabilitation, missing central incisor, porcelain laminate veneers

Introduction

Esthetic dentistry is a cumulation of quantifiable dimensions and artistic sensitivity.¹ The interactions between incipient restorative materials and techniques sanction the reproduction of dental structures, renovating form, and function in such a way that restorative procedures become imperceptible. The arrangement and proportion of maxillary anterior teeth are the major determinants of a gratifying appearance.² An esthetically

gratifying renovation of malformed or discolored teeth has been perplexing quandary for dentist. In past few years, a conservative approach to ameliorate the esthetic appearance has led to widespread utilization of the veneering system. A veneer is a layer of tooth-colored material that is applied to a tooth to restore a localized or generalized defect and intrinsic discoloration.³ Porcelain veneers, which have been accepted for long-term augmentation of tooth and smile deficiencies with congenitally missing teeth, sanction clinicians to engender this esthetic use.^{4,5}

The purpose of this article was to show the considerable improvement in esthetic that can be achieved today with all ceramic veneer for rehabilitation of congenitally missing central incisor.

Case Report

A female patient aged 21 years reported to the Department of Conservative Dentistry with the chief complaint of discolored upper front teeth (Figure 1). Clinical examination showed the absence of maxillary left central incisor. Intraoral periapical radiograph did not show impacted left central incisor and it was congenitally missing. There was no associated periodontal periapical pathology in relation to this tooth. Diagnostic impressions and study models were prepared. To achieve optimum esthetics in this condition with conservative tooth preparation, porcelain laminate veneer was the preferred choice of treatment. On evaluation of width (Figure 2) and length of lateral incisor, it was decided to restrict the veneering only to lateral incisor instead of all 6 anterior teeth. Hence, for esthetic reason upper lateral incisor (22) preparation modified to a central incisor was planned. Mock preparation was done on the cast and diagnostic wax-up was done. Patient was explained the treatment plan and her consent was taken to go ahead with it.

Tooth Preparation

Labial preparation was minimal and limited to enamel only. Labial reduction of 0.3-0.5 mm depth was done (Figure 3). Three horizontal cuts were made in the labial surface of teeth using depth cutter wheel. Using depth cuts as a guide, tooth reduction was done by using round-end tapered diamond. Chamfer finish line was established. Proximal reduction was performed as an extension of facial reduction with the finish line terminating labial to the contact area, and it was done by using round-end tapered diamond bur.



Figure 1: Intraoral view of a 21-year-old woman shows missing maxillary left central incisor.



Figure 4: Maxillary lateral incisor prepared to receive porcelain veneers.



Figure 2: Tooth width measurement for the maxillary left lateral incisor.



Figure 5: Porcelain veneer for the maxillary left central incisor



Figure 3: Labial reduction of the maxillary left central incisor.



Figure 6: Immediate post-operative view. The color of the veneers blends nicely with that of the crowns. This match was achieved by selecting the most appropriate shade of resin cement.

For incisal reduction, incisal overlapping preparation was decided as the tooth required lengthening. This design also provides a vertical stop that helps in the proper seating of veneer during luting. Three vertical depth cuts were prepared in an incisal edge using multiple wheel diamond bur and used

as a guide for incisal reduction. The sharp angles on labial and lingual surfaces were rounded so as to increase the surface areas of enamel (Figure 4). Lingual reduction was done by

lingual finish line and deep chamfer margin was placed 1.5 mm gingival to the incisal edge using round and tapered bur and merged with proximal finish lines. Impression was taken with addition silicone material by putty wash technique after gingival retraction.

Try in was done to verify the fit and esthetic of veneer. After this, the veneer was removed, rinsed, and dried. The inner surface of veneer was etched with 5% hydrofluoric acid, and silane coupling agent was applied to the inner surface of veneers and air dried (Figure 5). The enamel was also etched with 37% phosphoric acid and bonding agent was applied both to the inner surface of the veneer and to the tooth surface. The porcelain veneer was fixed by dual cure cement (RelyX U 100, 3M ESPE). The excess luting cement was removed from marginal areas with a sable brush moistened with bonding agent (Figure 6). The luting cement was cured from all directions and occlusion was checked for high points. After a month from the delivery, the gingiva was healthy, and the interproximal area was fully filled with interdental papilla. Patient was satisfied with the harmonious shape and contour of the restorations, which also showed good function.

Discussion

The incrementing demand for esthetic anterior teeth has always emboldened the practitioners to endeavor incipiently developed materials for more conservative treatment options. Ceramic veneers are popular and have been utilized for many years. In spite of their phenomenal prosperity, they offer numerous challenges during accommodation. When congruously placed, ceramic veneers are among the most beautiful and long lasting of all dental restorations.⁶⁻⁸ With the introduction of adhesive systems, eliminating the need of full coverage for all-ceramic renovations, more conservative treatment options have been put forward. One of the most minimally invasive techniques is the application of laminate veneers.⁹ Ceramic veneers not only reduce the destructive approach and minimize the gingival reaction risk of full crowns but also mimic the translucency of natural tooth structure and can provide more promising esthetic results.¹⁰⁻¹² Several clinical studies have reported the esthetic performance, biocompatibility and durability of porcelain laminate veneers, and their prosperity rate.^{12,13}

Prosperity in virtually all dental treatment is dependent on case selection. The coalescing of the ceramic veneer color with the color of the cement and the underlying structure is very consequential. Color match requires consequential artistic ability and patience on the component of both the dentist and the technician.¹⁴ Matching treatment to the needs of the patient is the primary responsibility and conservation of tooth structure is critical in treating adolescent patients.

Missing central incisor leads to conspicuous asymmetry in patients smile and shift in the midline and the lateral incisors

frequently erupts mesial to their normal position.² Treatment plans for patients with missing maxillary central incisors have traditionally included either space closure or space reopening.¹⁵ The most prevalent objections to orthodontic space closure are that the treatment outcome may not look “natural,” that retention is arduous, and that the functional occlusion may be compromised.¹⁶ In the present case, orthodontic treatment was extemporary because the patient had a straight profile and on doing orthodontic treatment the profile would become convex.

Many clinicians have therefore preferred to create space for missing central incisors with single tooth implants or resin-bonded bridges, however, neither approach produced results that were entirely satisfactory from an esthetic and functional standpoint.¹⁶ Ceramic laminate veneer remains the prosthetic recuperation that best complies with the principles of present day esthetic dentistry. It is kind to the soft tissue and the adjoining periodontium, evades the utilization of any metal structures, and possess excellent esthetic quality. It is also the only prosthetic restoration enabling a consequential proportion of the natural enamel to be conserved.

Conclusion

This clinical report shows that porcelain laminate veneers can meet esthetic and functional desires of the patient with missing maxillary central incisor. Porcelain laminate veneer is a great choice to transmute tooth shape because of relatively minor tooth reduction, short treatment time, and acceptable esthetics. In a case of transmuting a tooth shape with porcelain laminate veneers, pre-treatment evaluation, space analysis, and diagnostic wax-up are paramount factors.

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