

Rehabilitation of peg shaped lateral incisors with ceramic veneer: A case report

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Abstract

The most common discrepancy concerning tooth size is the presence of peg shaped lateral incisors, which can cause teeth with reduced size, anterior diastema and consequently an unpleasant smile. The development of adhesive dentistry and ceramic veneers allowed all ceramic bonded restorations to become an esthetic, durable and functional approach to reestablish the smile harmony.

The purpose of this clinical report is to describe a conservative treatment approach using ceramic veneer to restore an esthetic disharmony caused by bilateral peg shaped lateral incisors.

Key words: Ceramic veneers, lithium disilicate and peg shaped lateral incisors.

Introduction

The smile improves self-confidence, personality, social life and has psychological effect which directly influences the facial expression and physical attractiveness of an individual. ¹Peg shaped lateral incisors result in esthetic disharmony involving alteration of position, shape, and size of teeth. According to “American Journal of Orthodontics and Dentofacial Orthopedics” the prevalence of peg shaped upper lateral incisors was reported to be 1.8 %. The rates are higher in Asian population. It varies by race, population and sex. ²

Preservation of remaining tooth structure, esthetics, and longevity of the restoration are important factors to be considered when a treatment plan is developed. Various treatment

options for peg shaped lateral incisors includes direct and indirect resin materials and ceramics. ³ Ceramic veneer is a conservative substitute to full coverage crown for improving the appearance of anterior teeth. It allows to restore function and aesthetics using conservative and biologically sound methods that will promote long term oral health. ⁴⁻⁵

This article describes a minimal intervention approach to restoring bilateral peg shaped upper lateral incisors using lithium disilicate veneers.

Case description

A 29 year old male patient reported to the department of Prosthodontics, Bir hospital with the chief complaint of small teeth in the upper front region and wanted to improve the appearance of his smile. On examination his lip length was average 21 mm (according to Farkas et al) ⁶ and smile line was average (according to Tjan et al) ⁷. Intra oral examination revealed bilateral peg shaped lateral incisors on maxillary arch and rotation of right lateral incisor (Fig 1-2). Patient had normal vertical and horizontal overlap in anterior teeth region, adequate and

Conflict of Interest: No

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healthy tooth structure, bone support and no periapical pathology. Restorative space was also evaluated during the right and left lateral movements.

Preliminary impressions were made and diagnostic casts were obtained with type 3 dental stone (Kalabhai karson Mumbai). Diagnostic wax up was done using tooth coloured modelling wax (Renfert geo classic natural) to restore the morphology of peg shaped laterals (Fig 3). Once the patient was satisfied with the mock up, he was informed about the treatment options, including their advantages and disadvantages. Lithium disilicate veneers was planned with the patient consent. Shade selection was done and approved by the patient. (Vita 3D-Master; Vitadent, Brea, CA).

Polyvinyl siloxane putty index was made of the diagnostic mock up (Flexitime easy putty; Heraeus Kulzer) (Fig 4). Provisional veneers were made with bisacrylic resin (Cool temp coltene) which was used as a guide during tooth preparation (Fig 5). Three horizontal grooves were made with self-limited depth cutting bur (Sofu veneer kit) and was marked with a pencil. Bur was placed at three different inclinations to prevent from under or over preparation of cervical and incisal third. Further preparation was done with round end tapered bur. Once the mark had disappeared it became apparent that the desired depth had been reached.

After facial reduction, proximal margins were short of breaking the contact. One mm of incisal reduction was done with a round end tapered bur. Then remnants of bisacryl was removed with the help of a straight probe and 0.3 mm chamfer finish line was made at the supragingival level. Tooth preparation on the other side was done following the same guidelines (Fig 6).

Retraction cord (size 00 medipack) was placed into the gingival sulcus and final impression was made with poly vinyl siloxane with putty

wash technique (Coltene) (Fig 7). Impression was sent to the laboratory for fabrication of Lithium disilicate veneers (IPS e.max Press, Ivoclar Vivadent). Provisionalisation was done with bisacrylic by the direct technique using the initial putty index (Fig 8).

Cementation procedure

The ceramic veneer, obtained from the laboratory was inspected for any cracks, try in was done and marginal discrepancy was checked with a probe and visual inspection. (Fig 9)

Following the manufacturer instructions, the veneer was treated with 5 % hydrofluoric acid for 20 seconds with the help of brush then rinsed with water for 1 min and gently dried. It was cleaned with 37% phosphoric acid (Dia etch) for 20 seconds and rinsed and dried so as to remove any residual salts after etching. Silane coupling agent (ultradent silane) was applied with a brush for 1 min which was then dried, after which bonding agent was applied. (Fig 10).

The teeth were isolated with rubber dam and floss tie was done to expose the margins. Teeth were etched with 37 % phosphoric acid for 20 seconds and rinsed with water and dried with jet of air (Fig 11). Bonding adhesive (Universal all bond) was applied to the enamel surface with a brush and dried for 5 seconds. (Fig 12)

Dual cure resin cement (para core) was used to bond the ceramic veneers. The veneers were positioned on the tooth from incisal to apical direction. Gross excess was removed with a microbrush and light cured from both the buccal and lingual sides for minimum of 20 seconds each to ensure complete polymerization. Careful removal of excess cement from the margins and interproximally was done with number 12 no scalpel blade. (Fig 13).

Polishing was carried out with appropriate finishing burs and series of abrasive points and

cups (One Gloss; Shofu, San Marcos, CA). The occlusion was checked, there was light contact in maximum intercuspation and no interferences in protrusive, right and left lateral movements

(Fig 14). Radiographs were taken and the patient was instructed for proper hygiene methods. Recall visits were scheduled after one week and 6 months. (Fig 15)



Figure 1: Maxillary arch



Figure 2: Mandibular arch



Figure 3: Diagnostic wax up

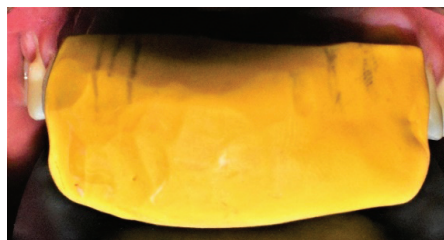


Figure 4: Putty index with poly vinyl siloxane



Figure 5: Provisional guided tooth preparation



Figure 6: Tooth preparation



Figure 7: Poly vinyl siloxane final impression



Figure 8: Provisionalisation with bisacrylic resin



Fig 9: Lithium disilicate veneer

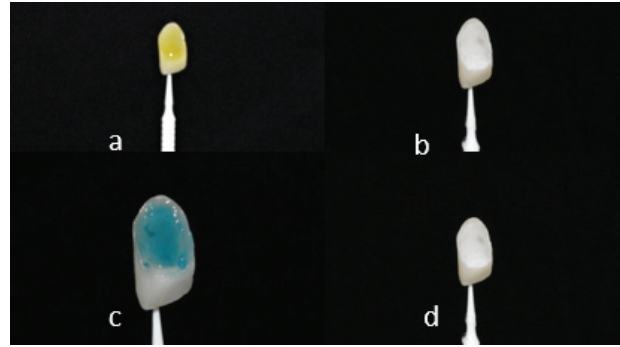


Fig 10: a) Etching with 5% hydrofluoric acid
b) After etching
c) Cleaning with 37% phosphoric acid d) bonding agent application

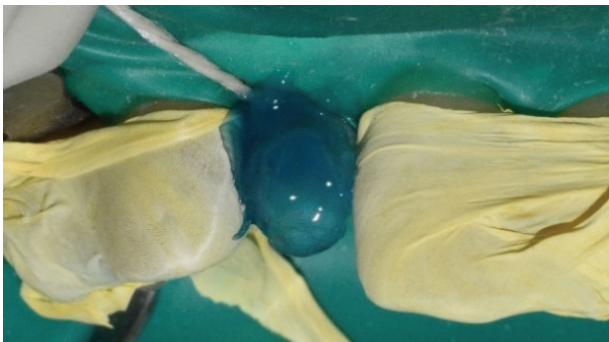


Fig 11: Acid etching with 37% Phosphoric acid



Fig 12: Bonding agent application



Fig 13: Resin flash removal with no 25 scalpel blade



Fig 14: a) Maximum intercuspation
b) Protrusive movement
c) Right lateral movement
d) Left lateral movement



Fig 15: After 1 week follow up

Discussion

As the popularity of esthetic dentistry increase, growing number of patients are seeking treatment for the improvement of unesthetic anterior dentition. The morphology of the peg shaped lateral incisor is a challenge for the clinician during prosthetic rehabilitation.

Direct composite restoration is one of the conservative, faster and less expensive treatment option however, there are some limitations of resin composite restorations such as colour stability and polish retention which will affect the long-term esthetics⁸. In a randomized split-mouth clinical trial by Gresnigt et al a comparison of the indirect resin composite and ceramic laminate veneers was performed. Indirect resin composite material showed surface degradation and diminished gloss retention whereas all ceramic restorations remained smooth and their gloss was retained until the final follow up period. Therefore, ceramic veneers are the material and treatment of choice.⁹

Comlekoglu et al reported that minimal tooth reduction, esthetics, and maintenance of healthy tissues are the major advantages of conservative preparation of ceramic laminate veneers.¹⁰

Ideally the preparation should be restricted to the enamel, although dentin exposure is often unavoidable, especially in the cervical area as discussed by Grenigt et al.⁹ A provisional template was used in this case as a guidance during tooth preparation.

Ceramic veneers are restorations that are bonded using adhesive cements which allows high predictability, as well as aesthetics, allowing improvements in color, shape, positioning as reported by D Arcangelo et al.¹¹ According to Aboushelib et al once properly cemented, ceramic veneers becomes an integral part of the tooth structure and share part of applied loading stresses during masticatory cycle.¹²

Conclusion

Maximum aesthetics can be obtained with ceramic veneers which is a conservative treatment option for peg shaped laterals. The success of ceramic veneers depends on proper

case selection and meticulous cementation protocol.

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