

Conservative Management of Bilateral Peg-shaped Lateral Incisors with Modified Laminate Preparation

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Abstract

One of the most frequent issues related to tooth size discrepancy is the occurrence of peg-shaped lateral incisors. This dental condition leads to teeth with smaller dimensions, often resulting in an anterior diastema, which, in turn, can affect the overall esthetics of a smile, causing dissatisfaction and discomfort for the affected individual. The presence of peg-shaped lateral incisors can create an imbalance in the smile, making it look less harmonious and aesthetically pleasing. Correcting this condition becomes a primary concern for many patients seeking improvement in their smile's appearance and boost their self-confidence. This case report focuses on the application of conservative preparation design to manage peg-shaped lateral incisors. This case report evaluates the effectiveness of this conservative treatment approach in correcting dental anomalies and achieving satisfactory esthetic results with conservation of enamel with advanced luting composites.

Keywords: Conical tooth, Laminate veneer, Peg lateral.

INTRODUCTION

Peg-shaped lateral incisors are dental anomalies characterized by a conical shape and reduced size, leading to esthetic and functional concerns. Various treatment methods have been proposed to address this issue, with ceramic crowns being a popular option due to their aesthetic and functional benefits.^[1] A minimal invasive should be chosen depending on the clinical situations. Therapeutic option has to be carefully indicated to ensure longevity of the prosthesis. Tooth vitality, color, position, and occlusion must be pre-evaluated to raise the most suitable therapeutic preparation design. Adhesive dentistry and ceramic veneers have revolutionized the field of restorative dentistry, enabling the creation of aesthetic and functional all ceramic-bonded restorations.^[2] This approach has become a popular choice for restoring smile harmony. This clinical report aims to present a conservative treatment strategy used to address the aesthetic disharmony caused by bilateral peg-shaped lateral incisor.

CLINICAL REPORT

A 22-year-old female patient consulted the department of prosthodontics with complain of unesthetic smile due to small lateral incisors in comparison with central incisors (Figure 1). The clinical examination showed peg-shaped laterals which were undersized with a conical shape.

A preliminary impression using irreversible hydrocolloid (Prime dental Alginate) was made. On the diagnostic model, evaluation of available size and restorative space was done. Taking into consideration the aesthetic requirement of the patient and conservation of tooth structure, wax-up was done. Diagnostic wax up was transferred in patient's mouth with composite resin as a pre-treatment aesthetic evaluation. Patient expressed satisfactory esthetic value for the planned treatment strategy (Figure 2).

The preparation similar to veneer preparation with incisal overlap extending till 1mm short of palatal contact was done to protect dentoprosthetic joint from occlusal contacts. A retraction cord was packed for gingival displacement. A mock-up driven technique preparation restricted to enamel was done. With diamond-round bur, grooves were prepared to limit the preparation depth. The labial surface was then prepared with a round-end tapered bur without breaking the contact point. Atypical preparation was done for the palatal

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Figure 1: Pre-operative intraoral view



Figure 3: Tooth preparation and intraoral scanning



Figure 2: Try-in of provisional restoration

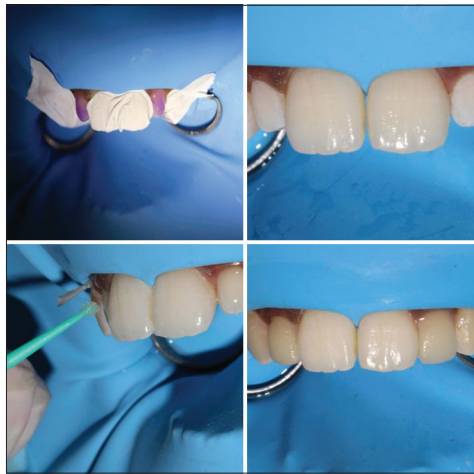


Figure 4: Cementation protocol

face. Once the preparation was verified, a 3-D intraoral scan was made. The prosthetic components were fabricated utilizing the exocad Dental software (Figure 3). Lithium disilicate black was milled to fabricate the veneers. The received prosthetic pieces were intraorally examined for marginal fit. The prosthesis is subsequently optimized to enhance morphological characteristic with special attention to occlusal contacts, ensuring that these teeth were entirely excluded during mandibular movements. Notably, the protrusive movement was solely supported by the central incisor.

After the fabrication of ceramic veneers, the bonding protocol was initiated. The following steps were thus performed (Figure 4).

1. Isolation of the teeth with rubber dam and a saliva ejector
2. Etching veneer with 10% of hydrofluoric acid for 20 s, followed by rinsing with distilled water for 1 min
3. Application of a silane coupling agent for 1 min
4. Etching of the enamel surface with a 37% of phosphoric acid etchant for 30 s, rinsing with water, and drying with air
5. Application of two consecutive coats of adhesive system on the enamel surface, followed by gentle air drying for

5 s and light-curing for 20 s using a light-emitting diode (LED) curing unit

6. Bonding of the ceramic laminates with application of luting resin (Variolink Veneer, Ivoclar Vivadent, Brazil) on the surface of the laminate porcelain veneers
7. Removal of gross excess with a micro brush, followed by photoactivation for 60 s using a LED curing unit
8. Careful removal of small excess resin cement, followed by a three-step polishing system using a flame-shaped diamond finisher, a flame-shaped diamond polisher, and diamond paste with a bristle brush.

The final aspect of the treatment can be observed in the provided images.

DISCUSSION

In patients with peg-shaped lateral incisors seeking esthetic treatment, typical procedures involve correcting dental shape and volume and closing diastema spaces.^[3-5] However, in the presented clinical case, the patient did not have diastema between upper canines or upper central incisors, making the

main goal of ceramic restoration the correction of dental shape and volume only. In cases where patients have small diastema, direct bonding restorations can be a conservative, esthetic, and cost-effective option, particularly when occlusal issues are absent. Nevertheless, composite resin restorations have limitations in terms of color stability and long-term retention of polishing in esthetic areas.^[6] Hence, indirect ceramic veneers were chosen as the most suitable material and treatment option.

When discussing treatment options with the patient, it is essential to provide a comprehensive explanation of each technique's advantages and limitations, helping the patient make an informed decision. In this particular case, together with the dental professional, the patient opted for indirect ceramic veneers due to their predictability in achieving esthetic results with minimal or no teeth preparation.^[4]

Regarding adhesion, a total etch technique adhesive system was used, known for producing high bond strength values when applied to enamel. Since the entire adhesion area in this clinical case was located on enamel without dentin exposure, the long-term results are expected to be favorable, as enamel adhesion tends to be stronger and more stable compared to dentin adhesion.^[7]

CONCLUSION

This clinical case report illustrates the potential of a straightforward treatment approach that achieved exceptional esthetic and functional results, leading to high patient

satisfaction. The utilization of ceramic veneers successfully corrected dental shape and volume, enhancing the patient's smile harmony. With no diastema between upper canines and central incisors, the focus was solely on restoring the peg-shaped lateral incisors, resulting in a natural-looking smile. The patient's excellent gingival alignment and oral health played a crucial role in the treatment's success. Engaging the patient in the decision-making process aided by study cast models and diagnostic wax-up, further contributed to the treatment's overall effectiveness.

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