The presence of a diastema between the anterior teeth can be esthetically challenging because it may distort a pleasing smile. While several treatment options for diastema closure can be presented to the patient, a carefully developed diagnosis is necessary to formulate the most conservative and predictable treatment plan. Providing minimally invasive treatment and understanding the best options for tooth preservation are important aspects of the prognosis. A systematic esthetic analysis that progresses from facial to dentofacial to dentogingival and finally to dental analysis is needed for a successful esthetic outcome. Often patients seek treatment in early adulthood, limiting the options for conservatively replacing their restorations later in life. This is particularly true if the previous treatment goal was not accomplished through a minimally invasive approach. The purpose of this clinical report was to present the clinical parameters that are essential to conservative treatment planning for veneer replacement.

ABSTRACT

This clinical report describes a conservative treatment in veneer replacement where diastemas, malalignment, and midline shift were the main modifying factors. When replacement veneers are indicated, the definitive results can only be accurately predicted after an esthetic reanalysis of the existing restorations. (J Prosthet Dent 2016;115:393-396)
no tenderness, and joint examination revealed no crep-
itus or abnormality on opening or lateral excursive
movement. She exposed 75% to 80% of her maxillary
anterior teeth and 2 to 3 mm of tooth structure with her
lip in resting position. Both her lip mobility and lip length
were average, and the gingival margins were not
revealed. The patient had a wide smile showing the
buccal corridor on both sides.

After prophylaxis, home tooth-whitening treatment
was completed with 10% carbamide peroxide (Opales-
cence 10%; Ultradent Products Inc). Extraoral and
intraoral photographs were made for esthetic analysis. A
Digital Smile Design (DSD) analysis was completed to
determine ideal tooth shape and proportion in relation-
ship to the available space. Diagnostic casts were made
and mounted in an articulator (Stratos 300; Ivoclar
Vivadent AG). A diagnostic waxing was completed to
establish the most acceptable proportions of the maxillary
anterior teeth, given the limitations of maxillary anterior
tooth position and the impacted canine. The existing
ceramic veneers were removed, avoiding additional
preparation of the tooth structure. A silicone replica of
the diagnostic waxing was made, and diagnostic resto-
rations were placed with bis-acrylic interim material
shade B1 (Protemp; 3M ESPE). The diagnostic restora-
tions were used to evaluate esthetics, function, and
phonetics and to provide a guideline for preparing the
tooth structure. A complete evaluation of the desired
tooth position and alignment was accomplished (Fig. 2).
The tooth proportion of the maxillary centrals was
established at 75% to 85% to compensate for the
maxillary midline shift to the left (2 to 3 mm). According
to Chu et al., the width of a maxillary lateral incisor should be approximately 2 mm less than the central incisor. The width of the canine was established as 1 mm less than the central incisor. The vertical position of the maxillary teeth was evaluated to determine the appropriateness of the incisal edge position and its relationship with the border of the lower lip both at rest and dynamically, the distance between the upper and lower lip, and appropriate phonetics. According to Spear, the maxillary incisal edge position can be reestablished primarily on the basis of esthetic concerns; however, in many instances, this is a subjective endeavor. As there is a range within which the incisal length may be established, the functional requirements of the incisors as the anterior determinant of occlusal function must not be overlooked.

Occlusal evaluation was taken into consideration, and the patient’s horizontal and vertical overlap of 1 to 2 mm was reduced by decreasing the thickness of the ceramic veneers and establishing an improved width-length ratio. To make sure the occlusal forces were not directed at the restorative-tooth junction, the incisal-edge position was taken as the terminal point and the occlusal contact as the starting point during the intermediate pathway of movement.

The gingival architecture of the anterior segment did not need to be modified because of the lack of gingival exposure during smiling and a gingival discrepancy less than 1.5 mm. After the cervical margins were prepared, it was determined that the zenith and gingival heights were well balanced, providing adequate gingival harmony. The papilla formation in the presence of a diastema often results in blunting of the interdental papilla. One of the challenges of closing a diastema is not to leave an excessively wide gingival embrasure, often referred to as a black triangle. Because the patient’s previous restorations resulted in a distance of 6 mm from the base of the contact point to the crest of the bone, the papilla was partially present. The design and location of the contact point is the key requirement in avoiding black triangles; therefore, the contact of the restoration was placed closer to the gingival tissue (5 mm) from the contact point to the crest of the bone. In addition, studies have shown that the papilla proportion for maxillary anterior teeth, as measured from the gingival zenith to the papilla crest, is approximately 40% of the total length of the clinical crown. This was also replicated in the definitive restorations.
The trial and interim restorations replicated the desired contours and position of the definitive veneers. Because all the parameters had been established in advance, preparation of the teeth through the interim restorations progressed as though preparing teeth in optimal alignment. As seen in Figure 3, a minimal preparation for ceramic veneers was completed, and the interproximal areas were then refined. After the definitive impression had been made with a polyvinyl siloxane material (Aquasil; Dentsply Intl), the interim restorations were fabricated. Ceramic veneers were made from a lithium disilicate material (IPS e.max; Ivoclar Vivadent AG) and cemented with a dual-polymerizing adhesive system (All Bond 3; Bisco Inc) and resin cement (Calibra; Dentsply Caulk) (Fig. 4). The completed restorations are shown in Figure 5.

DISCUSSION

In the presence of diastemas and/or malalignment of the anterior teeth, orthodontic correction can be the most conservative treatment option. Sometimes restorative and periodontal procedures are necessary after orthodontics to provide the optimal outcome. Treatment plans should not be selected empirically but should be based on thorough documentation, measurements, casts, and photographs as part of adequate treatment planning. As illustrated for this patient, a complete evaluation of the treatment plan and prognosis could only be finalized after the existing ceramic veneers had been removed to evaluate the location and inclination of the teeth. The patient must understand that a more predictable evaluation of the definitive results can only be completed after removal of existing restorations and anesthetic analysis.

For this patient, after the removal of the restorations, complete crowns were deemed unnecessary. The patient also understood that she had to accept a compromised midline shift to avoid more invasive preparation of her teeth, including possible crowns and/or orthodontic treatment.

CONCLUSION

Many methods of treating anterior diastemas have been documented. Regardless of the treatment chosen, the patient should be aware that when replacement of ceramic veneers is necessary, previous restorations must be removed for a more accurate esthetic analysis and more predictable results for the definitive treatment plan.

REFERENCES


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