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Maxillary rehabilitation of tetracycline-stained teeth with diastemas by using ceramic veneers and a digital workflow

KEYWORDS
Ceramic;
Digital dentistry;
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Veneer

Esthetics has recently become a popular and essential part of modern dentistry.[1,2] In addition to the removal of dental infection and decay, patient also prioritizes a desirable smile. Tetracycline, a broad-spectrum antibiotic, is typically prescribed when treating infections. However, it is contraindicated during pregnancy due to its ability to bind with calcium needed for tooth development during mineralization, resulting in intrinsic staining.[3] Patients with tetracycline-inducing discoloration present with poor esthetics and in turn, low self-esteem. In addition, the improper alignment of the dentition such as diastemas also influence the esthetics of dentition, resulting in insecurities. The purpose of this study was to describe a technique used to restore tetracycline-stained teeth with diastemas in the maxillary arch with porcelain veneers.

A 54-year-old man presented to clinic with the chief complaint, "I want to fix my smile. I have staining and a gap between my teeth." Comprehensive clinical and radiographic examination revealed tetracycline staining of teeth and diastemas between the maxillary anterior teeth (Fig. 1). After various treatment opinions were discussed, the patient decided on the least invasive plan, ceramic veneers extending from the right maxillary second premolar to left maxillary second premolar. By using an intraoral scanner, preliminary scans were taken, followed by a digital wax up by using a software program (MeshLab, Visual Computing Lab, Pisa, Italy), which was then shown to the patient. Patient was satisfied with the digitally mockup proposal. A 3-dimensional (3-D) model of the wax up was printed by using photopolymer resin, followed by the fabrication of a silicone matrix to aid in making the temporary restorations and reference for the final design. The ten teeth were then prepared for veneer placement by a 1 mm incisal reduction and 0.5–0.7 mm facial reduction. The lingual surface of each tooth was reduced by 2 mm in height and 0.5–0.7 mm in the facio-lingual width. Smooth chamfer finish line was used. Temporary veneers were fabricated with chemically-polymerized composite resin (Integrity, Dentsply International Inc., Milford, DE, USA). Spot etch technique was utilized to prevent damage to enamel surface during removal of the temporary restorations, followed by bonding and cementation by using resin cement. Patient was dismissed, allowing time for the patient to test the temporary restorations.

Patient returned a week later suggesting softer contours on his maxillary incisors. His preference was noted, and prosthetic design adjusted. Utilizing an intraoral scanner (Medit i700, Medit Corp., Seoul, South Korea), the maxillary and mandibular arches were captured for the final impression and sent to the laboratory where a 3-D model was printed. Temporary restorations were recemented. A bilayer technique was used to fabricate the porcelain veneers. Lithium disilicate was used as a base with the addition of feldspathic porcelain to manipulate the translucency, creating a more

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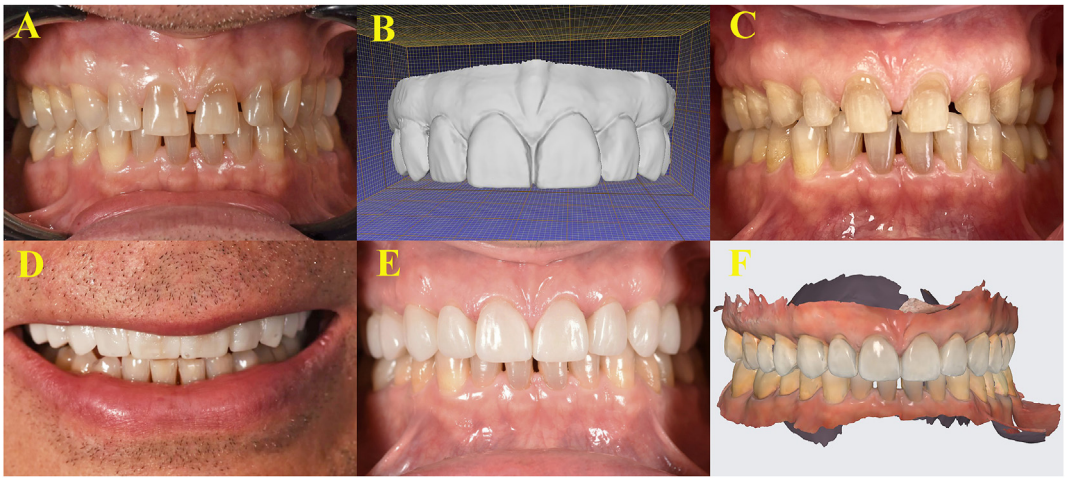

Figure 1 Workflow used in this technique (A) Preoperative intraoral view (B) Digital mockup of prosthesis (C) Preparations for veneers (D) Temporary prosthesis (E) Intraoral view after the cementation of veneers (F) Digital scan of maxillary and mandibular arches after treatment.

desirable smile. Patient returned for final cementation. Temporary veneers were removed, and enamel surface cleaned, etch and bonded. The intaglio surface of the final restorations was etched with hydrofluoric acid, treated with saline and permanently cemented with resin cement (Panavia-V5, Kuraray America, Inc., New York, NY, USA). Esthetics, phonetics, and occlusion was evaluated and confirmed. Lastly, a digital scan was capture for record in the event an adjustment is necessary. Patient was satisfied with final outcome. The technique depicted in this study may be a feasible way to eliminate tetracycline-stained teeth with diastemas and transform smiles with ceramic veneers.

Declaration of competing interest

The authors have no conflicts of interest relevant to this article.

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