

CLINICAL REPORT

Adhesion and optics: The challenges of esthetic oral rehabilitation on varied substrates—Reflections based on a clinical report



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When one or more teeth are badly discolored, their restoration is problematic because poor appearance affects not only the crown but also the periodontal tissues.^{1,2} For example, a minimum soft-tissue width of 2.0 mm is necessary to mask titanium and replicate the light reflection of the natural dentition.²

Particularly challenging is the selection of the most appropriate material for the restorative procedures and the substrates for the adhesion of the prosthetic components. The clinician requires an understanding of the optical and adhesive properties of the materials to plan and create predictable esthetic and functional restorations.³

The purpose of this clinical report was to present a solution for a complex esthetic challenge based on detailed planning, the management of soft tissues, and restorative choices that considered the optical and adhesive properties of the materials.

CLINICAL REPORT

A 43-year-old woman dissatisfied with the esthetics of her smile presented to the Dental Clinic of APCD

ABSTRACT

Patients with challenging prosthodontic conditions require rehabilitation with a biological, functional, and esthetic approach. When one or more teeth are badly discolored, their restoration is problematic because poor appearance affects not only the crown but also the periodontal tissues. This clinical report describes a complex esthetic rehabilitation with conservative tissue management and ceramic restorations. Subepithelial connective tissue graft surgery and the replacement of a cast metal post with a glass fiber post addressed the problem of a discolored maxillary central incisor. The discolored right maxillary incisor was restored with a combination of a medium-opaque, lithium-disilicate ceramic coping to mask the dark root and to approximate the color of the other incisors. Subsequently, 6 ceramic veneers were placed. A knowledge of the materials' optical properties and adhesion possibilities helped solve this complex problem. (*J Prosthet Dent* 2021;125:15-7)

Regional Americana, Brazil. The gingival tissue associated with her maxillary right central incisor was darkened from an existing metal-ceramic crown (Fig. 1). After a clinical examination, a multidisciplinary treatment plan was approved.

Periodontal surgery was performed to increase the thickness of the labial gingiva around the right maxillary central incisor.⁴⁻⁶ After anesthesia, a thin connective tissue graft was harvested from the anterior region of the palate and was inserted into the labial gingiva of the right maxillary central incisor. Concurrently, the gingival margins of the adjacent teeth were recontoured with a gingivoplasty (Fig. 2).

Ninety days after the surgery, the existing metal-ceramic crown was replaced by an interim acrylic resin crown (Try In; VIPI) (Fig. 3). The root canal was retreated,

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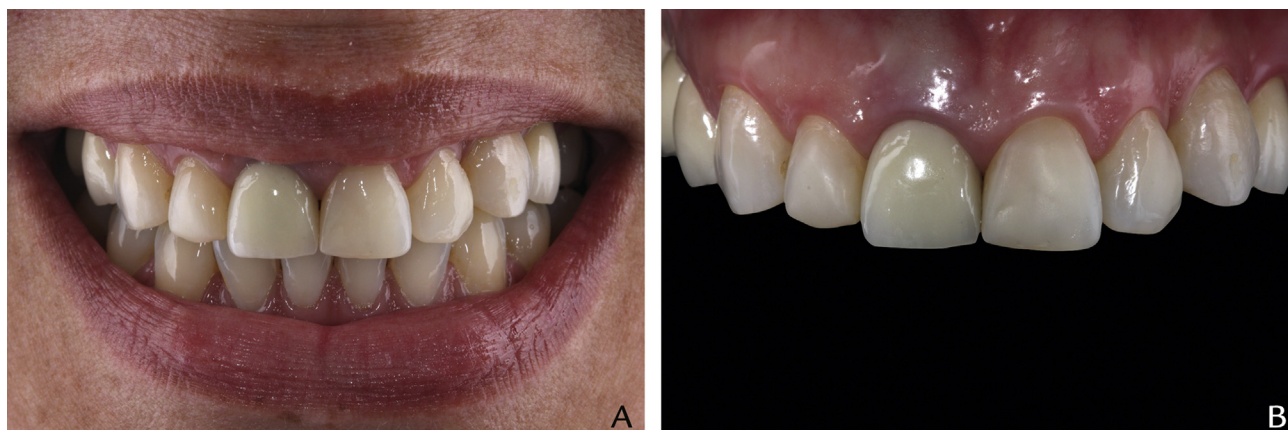


Figure 1. Pretreatment condition. A, Smile view. B, Discolored gingival tissue around right maxillary central incisor.



Figure 2. After gingivoplasty.



Figure 3. Interim acrylic resin crown.

and the existing metal post was replaced with a glass fiber post (Whitepost; FGM) modified with composite resin (Empress Direct Dentin A2; Ivoclar Vivadent AG), which was cemented with resin (Multilink N; Ivoclar Vivadent AG) (Fig. 4) to optimize esthetics and adhesion.^{7,8}

Six ceramic restorations were placed on the maxillary canines and incisors. The restoration on the right maxillary central incisor was segmented with a medium-opaque lithium disilicate ceramic substrate (IPS e-max press medium opacity; Ivoclar Vivadent AG) cemented over the discolored tooth substrate and then a ceramic veneer. This approach effectively masked the right maxillary central incisor and optimized the overall esthetic match.⁹

The laminate veneers were minimally prepared with diamond rotary instruments (#1014, #2135 Diamond tips; Komet), abrasive paper disks (Sof-Lex; 3M), and abrasive rubber points (Jiffy; Ultradent Products, Inc). The crown was prepared by using diamond rotary instruments (#2215, #2200; Komet). After impression making (Virtual; Ivoclar Vivadent AG), the shade of the tooth preparation



Figure 4. Glass fiber post-and-core modified with composite resin.

was selected (VITA classical; VITA Zahnfabrik), and interim prostheses were fabricated with bis-acryl resin material (Protemp 4; 3M ESPE).

The 5 laminate veneers and the 2-part crown were fabricated (Fig. 5) and evaluated clinically with try-in paste (Variolink Esthetic LC Try In; Ivoclar Vivadent



Figure 5. Laminate veneers and 2-part lithium disilicate ceramic crown.



Figure 6. Completed treatment.

AG).^{10,11} The restorations were conditioned with 10% hydrofluoric acid (Power C-Etching; BM4) for 20 seconds, washed, and cleaned with 37% phosphoric acid for 10 seconds. Silane adhesive (Excite F; Ivoclar Vivadent AG) was applied, and the restorations were seated with resin cement (Variolink Esthetic LC; Ivoclar Vivadent AG) and photoactivated for 40 seconds on each surface (Blue-Phase; Ivoclar Vivadent AG) (Fig. 6).^{12,13}

DISCUSSION

Periodontal surgery is often indicated before restorative procedures to improve the esthetics of the gingival tissues. The technique described with a connective tissue graft has been reported to provide predictable results and excellent esthetics, with color and texture matching the adjacent tissues.⁵ Less bone resorption and tissue contraction has been reported with flapless access.¹⁴

SUMMARY

This clinical report described the solution of a complex esthetic challenge with a multidisciplinary workflow combining soft-tissue graft surgery, endodontic re-treatment, replacement of the cast metal post by a glass fiber post, a 2-part complete crown, and laminate veneers.

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