



Accreditation Clinical Case Report, Case Type II: One or Two Indirect Restorations

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INTRODUCTION

One of the most difficult challenges facing a cosmetic dentist is matching anterior porcelain to natural anterior teeth. Achieving symmetry of shape, color, value, texture, and translucency can be a juggling act. Proper tissue control, preparation, laboratory communication, and exquisite ceramic skills are necessary to achieve a proper esthetic result, so that the patient feels confident with his or her smile. Patience on the part of the dentist, ceramist, and patient is mandatory, as it often takes more than one try in before the desired result is achieved. Metamerism will limit the match under all lighting conditions (including flash photography), so it is important to ascertain whether the patient deals with specific lighting conditions in his or her job (e.g., theater or television work). Conservative porcelain veneers have a high success rate and are an excellent treatment modality for irregular smiles.¹

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CLINICAL HISTORY

The patient was a 33-year-old female with an unremarkable medical history (Fig 1). She presented with a malformed lateral incisor #10 and a darkened lateral incisor #7, which tested vital (Fig 2). She desired a more pleasing smile. She was caries-free, had excellent oral hygiene, and had no signs or symptoms of temporomandibular disease.

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Figure 1: The full-face "before" view reveals distracting negative space in the #7 area. The "after" view reveals greater intra-arch harmony, which in turn, complements the facial features.



Figure 2: Lack of golden proportions in the "before" view creates an imbalance, which is corrected with conservative treatment.

DIAGNOSIS

Upon clinical examination, periodontal health, muscles and joints, caries, and all other soft and hard tissues were within normal limits. The patient's chief concerns were esthetic issues, as follows:

- malformed lateral incisor #10
- dark lateral incisor #7
- chipped incisal edges, #8 and #9
- excessive gingival display, #10.

TREATMENT PLAN

In order to address the patient's chief concerns, the plan included the following elements:

- porcelain veneers, #7 and #10
- small labial incisal composite, #8
- gingivectomy (Figs 3 & 4).

ARMAMENTARIUM

- Xylocaine 2% with 1:100,000 epinephrine (AstraZenica; York, PA)
- Citanest 4% (AstraZenica)
- 7901 carbide finishing bur (SS White; Philadelphia, PA)
- Aquaseal desensitizer (Aquamed Technologies; Chicago, IL)
- Examix impression material (Kerr; Orange, CA)

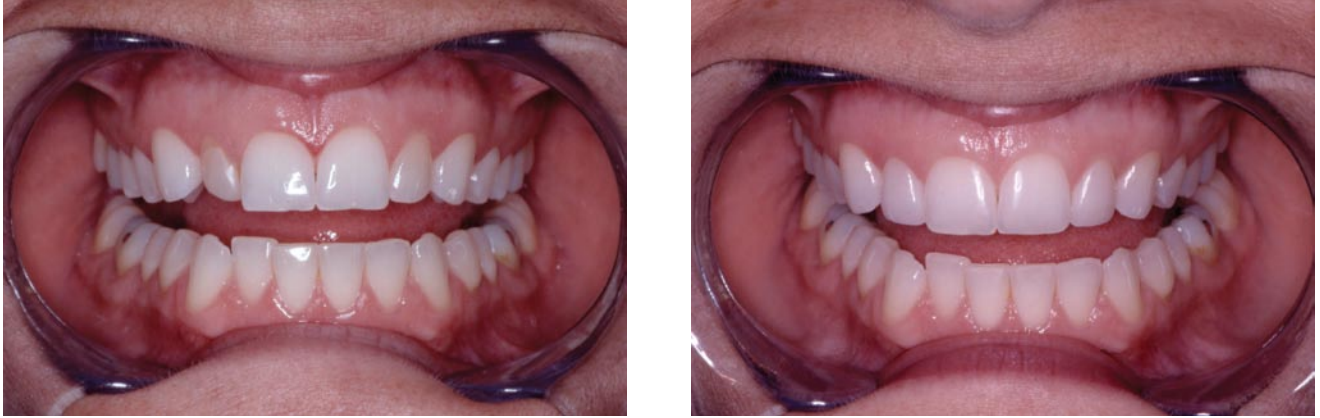


Figure 3: The postoperative retracted view displays a more symmetrical gingival line.



Figure 4: Preparations and diode laser tissue recontouring.

- Flow-it! flowable composite (Jeneric Pentron; Wallingford, CT)
- Renamel microfill composite (Cosmedent; Chicago, IL)
- Empress porcelain (Ivoclar Vivadent, Amherst, NY)
- Clearfil SE Bond bonding agent (Kuraray; Tokyo, Japan)
- phosphoric acid 37% (Ultradent; South Jordan, UT)
- OptiBond Solo Plus adhesive (Kerr)
- micro-etcher (Danville Engineering; San Ramon, CA)
- D-60 digital camera (Canon; Lake Success, NY)
- 4.8x loupes (Orascoptic Research; Middleton, WI)
- operating microscope (Global Surgical; St. Louis, MO)
- Enhance finishing cups (Dentsply Caulk; York, PA)
- FlexiDiscs (Cosmedent)
- RelyX veneer cement (3M ESPE; St. Paul, MN)
- Light-emitting diode (LED) curing light. (Demetron Kerr; Orange, CA)



Figure 5: The 1:1 frontal view reveals the imperceptible blending of composite on the incisal edges of the central incisors.



Figure 6: Photographs of the preparation shade are communicated to the ceramist.

- plasma arc curing (PAC) light (American Dental Technologies; Corpus Christi, TX)
- Silane primer (Kerr)
- AccuFilm (Parkell; Edgewood, NY)

PREPARATION

After obtaining local anesthesia, using topical 4% Citanest plain and

2% Xylocaine with 1:100,000 epinephrine,² teeth #7 and #10 were prepared for porcelain veneers. A diode laser was used to recontour the tissue on the mesiofacial of #10. The probing depth in this area was 3 mm, so that 1 to 2 mm of tissue could be predictably removed with a gingivectomy.³ Reduction of approximately 0.7 mm was made, with a deep chamfer at the crest of the tis-

sue. The incisal edges of #8 and #9 were smoothed, and a small amount of medium incisal microfill composite was placed (phosphoric acid etch, unfilled resin) on the facial-incisal aspect of #8, as the chipped area extended onto the facial surface of the tooth (Fig 5). It was polished with FlexiDiscs. An impression was taken, and temporary veneers were placed freehand with flowable com-



Figure 7: In the "after" 1:1 lateral view, the translucency and halo create a life-like mirroring of the adjacent central incisors.

posite after disinfecting the dentin with desensitizer. The margins of the temporary crown were finished with a dull 7901 flame carbide to eliminate overhangs; this would ensure proper tissue health at the bonding appointment, as seeping tissue precludes effective bonding.⁴

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Shade and contour were communicated to the ceramist by using digital photographs that were burned to a CD. Several angles and shade tabs were photographed to communicate color, translucency, and texture (Fig 6).

PLACEMENT

After anesthesia was obtained, the temporary veneers were removed and the porcelain veneers tried in. Water was used under the veneers to simulate translucent veneer cement. After obtaining consent from the pa-

tient and photographic verification of shade and contour, the decision was made to bond the veneers. The porcelain, which had been etched at the laboratory with hydrofluoric acid for bonding, was cleaned with phosphoric acid, given a final rinse in distilled water, silanated, and dried. The preparations were air-abraded with 50-micron aluminum oxide powder using the micro etcher to obtain a fresh, roughened surface for bonding,⁴ and cleaned with bleach using an inspiral tip in a syringe to disinfect the tooth and remove the smear layer.⁵ The preparations were then etched with phosphoric acid for 15 seconds, suctioned dry (but not desiccated), and moistened with a cotton pellet damped with desensitizer.⁶ Next, the preparations were coated with adhesive for more than 20 seconds, air-thinned, and light-cured. Translucent veneer cement was loaded into the veneers, which were seated. After visual and explorer verification of seating, the resin was cured for two to three seconds on the facial aspect, and the slightly hardened resin was

easily removed with apical pressure from a sharp scaler. The facial gingival margin was then tacked in place for three seconds with the light, and the palatal excess was removed in the same manner. Assuming an excellent fit, this technique results in very efficient clean-up.^{7,8} The restoration was then completely cured with a PAC light for at least 20 seconds per surface, rotating surfaces to avoid excessive heat build-up. Excess cement was removed with a scaler and a finishing cup. The occlusion was evaluated to ensure light centric contact and even contact on excursions.

Final photographs were taken at a subsequent appointment to allow tissue healing and tooth rehydration. The patient was very pleased with the final result (Figs 7 & 8).

CONCLUSION

Improving the overall appearance of a patient's smile and face through minimal dentistry can be a rewarding experience. The challenge of matching natural teeth is painstaking; however, the natural results are



Figure 8: The "after" view shows more uniform papilla widths and gingival embrasures, as well as balanced and harmonious incisal embrasure gradation.

worth it for the patient, the dentist, and the ceramist.

Acknowledgment

A special thanks goes to Sandy McCafferty at CMR Laboratory (Idaho Falls, Idaho) for her fine porcelain work.

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