

Accreditation Clinical Case Report, Case Type V: Six or More Direct Resin Veneers



by John Highsmith, D.D.S., D.I.C.O.I.

Dr. Highsmith received his dental degree from the University of North Carolina School of Dentistry in 1984, after which he completed a general practice residency at the Veterans Administration Medical Center, Baltimore, Maryland. He has been in private practice in Clyde, North Carolina, since 1985. An AACD member since 2000, he also is a member of the American Dental Association and the North Carolina Dental Association, a Fellow of the Misch Implant Institute, and a Diplomate of the International Congress of Oral Implantologists. He takes 100-200 hours of continuing education annually, and counts among his mentors Omer Reed, Peter Dawson, Bill Strupp, John Kois, Frank Spear, Bill Dickerson, Clayton Chan, Darryl Nabors, Paul Sletten, Mark Hyman, and Carl Misch. Dr. Highsmith's wife, Sandra Hayes, was his patient in the Accreditation case discussed here.

INTRODUCTION

In any treatment plan, the initial option considered should be the most conservative one that will achieve all the desired objectives of both patient and dentist. Composite resin often may be the most conservative approach. Minimal preparation, excellent longevity in carefully selected cases, and superior color-matching ability make complex bonding a necessary part of any cosmetic dentist's treatment armamentarium. These cases allow a dentist to make maximal use of his or her artistic abilities, rather than delegating the creativity of hands-on craftwork to a ceramist. Layered, undetectable restorations are routinely (albeit not always easily) achievable.

The alternative to direct composite veneers is a porcelain veneer restoration. Although commonly cited as such, preparation for a porcelain veneer is not necessarily more conservative than for a direct veneer. Preparation requirements for dark substrates are identical: adequate depth is required for proper block-out of the substrate and to craft a translucent look for the restoration, while striving to minimize added contour to the tooth.

A complete understanding of a patient's desires is absolutely critical to success in cosmetic dentistry.

With no laboratory cost, patient fees for direct veneers are generally lower than for indirect restorations. Hands-on time involved can be similar and often greater, depending on the speed of the clinician and the level of esthetics desired by the clinician and the patient.



Figure 1: Full-face, before and after; the overall effect is a more youthful, radiant, confident smile.

MEDICAL AND DENTAL HISTORY

The patient was a healthy 45-year-old female who had no significant medical concerns and took no medications. She presented with a Class I occlusion and no active caries or periodontal disease, except for mild gingivitis (Fig 1). Wear was noted on the anterior teeth. Twenty-year old study models revealed no appreciable difference in wear over time. Mandibular tori had been removed by a periodontist two years earlier, with free gingival grafting for recession on teeth #24 and #25 performed one year later (Fig 2). The patient had undergone intermittent bleaching, using 16% carbamide peroxide.

DIAGNOSIS

Clinical examination revealed worn incisal edges, a generalized dark tooth shade, and slight tetracycline staining, all of which con-

tributed to the patient's desire for improved esthetics. Tooth wear had created a loss of incisal embrasures, resulting in square tooth shapes. Additionally, the buccal corridor was slightly deficient (Fig 3).

TREATMENT PLAN

A complete understanding of a patient's desires is absolutely critical to success in cosmetic dentistry. The patient sought direct composite veneers for teeth ##3-14. Accustomed to a lifetime of tetracycline-stained teeth, she stated a desire to avoid extremely white teeth, and selected a shade between B-1 and B-2 on the master shade guide. She accepted softening of the incisal edges to create a more youthful appearance.

ARMAMENTARIUM

- 4.8x magnification loupes (Orascoptic; Middleton, WI)
- Zeon headlight (Orascoptic)
- micro etcher (Danville Engineering; San Ramon, CA)
- 37% phosphoric acid etching gel (Ultradent; South Jordan, UT)
- SE Bond (J. Morita; Irvine, CA)
- plasma arc curing light (American Dental Technologies; Corpus Christi, TX)
- Renamel composite resin system (Cosmedent; Chicago, IL)
- Herculite composite system (Kerr; Orange, CA)
- composite placement instruments (Cosmedent)
- Kolor Plus stain kit (Kerr)
- 7901 finishing burs (SS White; Philadelphia, PA)
- D-60 digital camera (Canon; Lake Success, NY)
- Night-White 16% carbamide peroxide (Discus Dental; Culver City, CA)



Figure 2: Retracted smile, before and after; the incisal edges benefit from more open incisal embrasures and more translucency.



Figure 3: Unretracted smile, before and after; the buccal corridor has been filled out.

- diode laser (American Dental Technologies)
- polishing cups, discs, and strips (Cosmedent)
- Brownie points (Shofu; San Marcos, CA)
- Accufilm marking paper (Parkell; Farmingdale, NY)
- FlexiBuff discs (Cosmedent)

- Enamelize polishing paste (Cosmedent)
- Nikon 35-mm camera system (Lester Dine; Palm Beach Gardens, FL)
- Ektachrome EPN slide film (Kodak; Rochester, NY)

TREATMENT

Following a protocol detailed by Dr. William Strupp,¹ a local an-

esthetic of 4% prilocaine without epinephrine was administered, followed by articaine 4% with 1:100,000 epinephrine. The patient had abstained from bleaching agents for a minimum of two weeks before bonding, to minimize any risk of reduced bond strength.²

Teeth #8 and #9 were treated first to develop the desired scheme for the shape, color, and anatomy of the



Figure 4: Starting with the two centrals allows the clinician and patient to visualize the change in shade and contour.

remaining teeth (Fig 4). A facial reduction of 0.5 to 0.7 mm was done, feathered to the gingival margin, to make room for the composite material. The incisal edge was reduced 1 mm, and the incisal embrasures were opened to allow for contouring. Interproximal contacts were not opened Radiographically undiagnosed caries was removed on the mesial and distal of the lateral incisors.

The preparations were air-abraded with 50-micron aluminum oxide powder in the micro etcher to clean and roughen the surface.³ A moist paper towel was placed over the patient's face to minimize contact with dust (which is not dangerous, but proves annoying to patients). A mylar strip was placed interproximally, the surface etched with 37% phosphoric acid, rinsed, and dried. SE Bond Primer A was placed for 30 seconds, air-thinned, and the Bonding Agent B was placed in a thin even

coat and light-cured for five seconds with the plasma arc curing light.

Polishing will occasionally reveal a small subsurface bubble or inclusion of dark debris or dust, which is very noticeable in photographs.

Since the substrate was not extremely dark, and the patient did not desire a bright white shade, no opaquer was used on the dentin before creative build-up. B-1 body microfill composite was placed over the entire labial surface using thin composite handling instruments, and the uncured material was cut back on the incisal edge with indentations to create lobes.⁴ Hybrid composite was used on the incisal edge for greater strength. A small amount of blue stain was placed in the depths of the indentations to accentuate incisal translucency. Slight

maverick stains of orange for characterization were placed near the disto-buccal line angles of #8 and #9 and the mesio-buccal line angles of #6 and #11 (Fig 5). Since there were several different iterations of this process, not all applications of stain were photographed. After the centrals were satisfactory, the lateral incisors and cuspids were prepared and built up using the same scheme as the centrals, with slightly less reduction on the cuspids to allow more natural color to show through the translucent composite. The premolars and molars were restored at subsequent appointments, a side at a time.

Contouring of the restorations was accomplished with the aid of finishing carbides and Brownie points. Rubber cups and points and finishing discs in a low-speed handpiece were used to polish the restorations. Final polish was with FlexiBuff discs and polishing paste. Flash was re-



Figure 5: Before and after; cutback for incisal translucency and placement of stains.



Figure 6: 1:1 frontal, before and after; relative symmetry in flash reflections is an indication of facial contour symmetry.

moved with a #12 scalpel blade (and a very still patient). Polishing will occasionally reveal a small sub-surface bubble or inclusion of dark debris or dust, which is very noticeable in photographs. Repair of these small annoyances is best achieved by grinding out the defect with a small diamond, beveling the small defect, air-abrading the area, etching to clean the area, applying a thin

layer of unfilled resin, and placing a small amount of either flowable microfill or microfill resin, curing, and finishing and repolishing the area.

Digital photographs were taken many times throughout treatment to evaluate symmetry, flash reflections, and overall appearance (Fig 6). Some gingival asymmetry was noted and corrected with the diode laser (Fig 7). Occlusal views are

crucial in developing labial anatomy and symmetry (Fig 8).

Since incisal edges were restored, excursions were checked and adjusted to be very smooth and even, maintaining the same angle of anterior guidance.

A critical factor to success in Accreditation is tissue health. Time is needed to allow for healing, as



Figure 9: Even minor adjustments at the tissue level can require more healing time before the final photographs for Accreditation.

minor adjustments at the margin can traumatize the tissue and require more time for gingival health (Fig 9).

This case required multiple stages of composite application and removal to achieve the desired result. The biggest concern was tooth #7, which was rotated preoperatively. The premolars were purposely crafted in a slightly lighter shade, as this area falls under the shadow of the lips. This effect looks very pleasing in natural light. The cuspids purposefully show slightly more orange color than the incisors and premolars, resulting in a more natural look, in accordance with the patient's desires.

CONCLUSION

The patient was extremely satisfied with the result, and enjoys her more youthful, brighter smile. She expressed pleasure at having canines again and at losing her flat "ground-down" look; and was very pleased to get rid of the yellow, stained look.

Since restorations of the incisal edges may cause slight changes in anterior guidance, a soft nightguard was fabricated to protect the restorations. If excessive wear is noted in the soft guard, a hard acrylic guard will be fabricated.

Acknowledgment

The periodontal surgery in this case was done by Dr. Emily Hall, Waynesville, North Carolina.

References

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Lessons Learned: What This Case Has Taught Me

by John Highsmith, D.D.S., D.I.C.O.I.

I did not attempt this case in order to regularly craft direct veneer cases; routinely taking a direct case to this level is not a realistic option in my practice. This case, in which I invested a great deal of time and energy, improved my ability to handle resin, pure and simple. For me, successful completion of this direct veneer case was like completing a mini-residency in handling composite resin and contouring anterior teeth.

Fashioning line angles, embrasures, and facial contours takes practice. Each time I craft an indirect veneer case and contour the provisionals, I use skills acquired on this case. When I do a smaller composite case on one or more teeth (even a Class IV), I use finishing and polishing skills that were honed on this case. Developing a sharper eye for incisal form, tissue symmetry, and facial anatomy is a natural by-product of an exercise like this. The goal was not to train myself to do anterior direct veneer cases, but rather, to improve my skills on the cases I routinely perform: veneer and smaller composite resin cases.

Doing a case like this requires a committed patient with whom you have a very good relationship—you will be seeing a lot of him or her! The patient in this case, my wife, Sandra, is very appreciative of her new smile and also is very happy to have helped me in my Accreditation journey.

Successfully completing this case has made me a better dentist on multiple levels: handling resin, repairing and polishing resin, contouring teeth directly, and using a diode laser to achieve gingival symmetry. In addition, seeing Sandra enjoy her new smile every day has been incredibly satisfying. This case has embodied my goal in achieving Accreditation—to become a better cosmetic dentist as I help to change lives daily. *JH*



Examiners' Perspective for John Highsmith, D.D.S., D.I.C.O.I.

by Nils Olson, D.D.S., F.A.A.C.D., F.A.G.D.

Dr. John Highsmith has submitted an exceptionally nice example of restoring 10 maxillary teeth with direct resin veneers for Accreditation Case Type V. The principle aspects of smile design were superbly addressed. By more fully developing the buccal corridor and reducing the prominence of the cuspids, which exaggerated the transition from the anterior segment to the posterior teeth, Dr. Highsmith created a broad smile with a smooth transition antero-posteriorly. The incisal embrasures as well as the incisal edges overall were nicely symmetrical from left to right, yielding a pleasing result and eliminating a slightly aged appearance. Treatment of the right lateral incisor to correct the rotation of that tooth addressed asymmetry with tooth #10.

The handling of the resin and masking of the mild tetracycline discoloration were very well-executed. Development of incisal halos was also nicely demonstrated, as was the overall level of surface finish.

The examiners were consistent in their praise of this case, with one examiner even professing envy at the achievement of such a nice result. (A minor concern was expressed relative to slightly excessive incisal translucency.)

This case superbly demonstrated that with careful attention to fundamental principles of smile design and a command of the use of esthetic composite resins, conservative treatment with direct resin veneers can deliver results of the highest level. *NO*

