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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.

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

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; 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

- Night-White 16% carbamide peroxide (Discus Dental; Culver City, CA)
- 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)



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



Figure 3: Unretracted smile; the buccal corridor has been filled out.

- diode laser (American Dental Technologies)
- polishing cups, discs, and strips (Cosmedent)
- Brownie points (Shofu; San Diego, 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 protocol detailed by Dr. William Strupp,¹ a local anesthetic

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



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. 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 and primer was placed for 30 seconds and blown dry, followed by the bonding agent, which was 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 was done with 12 bladed carbide #7901 flame finishing carbides and Brownie points, and polishing was performed with points, cups, and discs in a low-speed handpiece. Final polish was with FlexiBuff discs and polishing paste. Flash was removed with a #12 scalpel blade (and a very still patient). Polishing will occasionally reveal a small subsurface bubble or inclusion of dark debris or dust, which is very noticeable in photographs. Repair of these small annoyances



Figure 5: Cut-back for incisal translucency and placement of stains.



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

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



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

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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