

Predictable ultimate aesthetics

Guided minimally-invasive correction of asymmetrical maxillary central incisors using a value-based, Vita-endorsed direct composite layering system

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“The composite system used displayed remarkably smooth handling and aesthetic properties that were perfectly predictable featuring ultimate aesthetics...”

A 23-year-old female patient was referred to my service presenting with asymmetrical central incisors and a midline diastema. Specifically, tooth 21 had suffered sharp dental trauma secondary to her walking into a glass door at 9 years of age. Following a period of orthodontics lasting 4.5 to 5 years, the restoration had been replaced multiple times and to her dissatisfaction, a diastema had also appeared beside a noticeably translucent, misshapen and oversized 21MIBL Class IV repair (Figure 1). The socially-active patient desired an invisible restorative replacement with simultaneous closure of the diastema and corrective symmetry of the 11 relative to 21 (Figure 2).

Part of the workup involved baseline photographs and measurements to be used to design the ideal proportions of the final restorations digitally. Smile Designer Pro (Toronto, Canada) is a multi-platform digital smile design software with a simulation function. It was used to determine ideal proportions, ratios and specific measurements that would allow for predictable sizing and placement of the restorations relative to the patient’s midline and adjacent teeth. As the software allows calibration between the real and digital world, any proposed increase or decrease in dental form dimension can be easily quantified for transfer to a diagnostic wax-up and ultimately to a putty stent given the luxury of time and/or finances.



Figure 1. Initial situation.

Vital nightguard bleaching is the gold standard in efficacy, safety and retention. Leonard reported no adverse effects reported relative to patient symptoms or dental structure with effects maintained in 82% of participants at the 47-month post-bleaching mark.¹ Following a two-week course of custom nightguard bleaching using 10% carbamide peroxide (Opalescence, Ultradent) and the requisite stand down period of 10-14 days to allow for oxygen dissipation from the teeth, the patient decided to proceed without a diagnostic wax up and trial smile due to social calendar time restraints. The composite system selected was Kuraray Noritake Majesty ES-2. This is currently the only value-based composite system on the market that is Vita-endorsed using only 5 enamel and dentin shades to cover the 15 Vita Classic shade tabs to the most stringent degree, lending another degree of predictability.



Figure 2. x.



Figure 3. x.



Figure 4. x.



Figure 5. x.



Figure 6. x.



Figure 7. x.

Preparation day

Kuraray Majesty ES-2 Premium shade guides were used to ascertain the enamel, dentin and effect shades prior to tooth dehydration. A1 Enamel, A1 Dentin, Trans Clear and Trans Amber were selected. It was noted that a value enhancer (i.e. Majesty Esthetic HO) may need to be used to enhance the value of the bleached teeth.

The patient was anaesthetised and the old Class IV restoration removed (Figure 3). The teeth were isolated using a curved serrated metal strip (Komet) to protect the adjacent dentition. Following micro air abrasion using 27 micron aluminium

oxide, the enamel was selectively etched and a self-etching bond (ClearFil Universal Bond) applied. As there was no opportunity to complete a diagnostic wax-up, the lingual shelf was completed freehand, with the help of a Mylar strip. As the Digital Smile Design specified a 0.9mm extension of tooth 11M into the diastema, this dictated the dimension of our lingual shelf. As this area only features enamel, A1 Enamel (A1E) was placed to full contour in this area (Figure 4). The midline was refined and shaped using Sof-Lex discs (3M ESPE) and the final dimension of 11 measured with calipers to ensure perfect mesiodistal symmetry



Figure 8. x.



Figure 9. x.



Figure 10. x.



Figure 11. x.



Figure 12. x.



Figure 13. x.

with 21 (Figure 5). The Mylar strip was placed on the lingual axial aspect of 21 and the lingual shelf built to a thickness of 0.3mm, extending facially to the mesiofacial line angle (Figure 6). The join line was addressed next. Two layers of A1 Dentin (A1D) were placed with the second layer extending incisally and featuring dentin lobule irregularity and small connections to the incisal edge (Figures 7-8). Following placement of a thin layer of Translucent Clear within these dentin fingerlings incisally, a thicker worm of Translucent Amber was placed at the incisal edge and brushed into place (Figures 9-10). At this stage, the join line was invisible but we still had space for additional dentin volume, needed to brighten the value of the restoration (Figure

11). The value was toned up using a thin layer of Majesty Esthetic HO (Hollywood Opaque) before the enamel volume was replaced using A1 Enamel.

Primary, secondary and tertiary anatomy were established using a combination of Sof-Lex discs (3M, ESPE), red-stripe needle-point diamond burs (Mani), Astropol polishers (Ivoclar Vivadent), 45 micron diamond grit and 5 micron diamond grit progressive rubber polishers (Clinician's Choice) (Figure 12). Finishing and polishing was completed using an Astrobrush (Ivoclar Vivadent) and 1 micron aluminium oxide paste (Enamelize, Cosmedent) in conjunction with Flexibuff discs (Cosmedent) (Figure 13).



Figure 14. x.

The final result demonstrates successful placement of a seamless Class IV restoration to a dimension symmetrical to that of the contralateral tooth whilst simultaneously respecting the need to close the diastema; all guided by Digital Smile Design and facial landmarks. Clearfil Universal Bond features a time-tested, 10-MDP monomer with multi-modal functionality for a predictable bond to hydroxyapatite. The selective etch technique was used as Erhardt et al demonstrated a detrimental effect on shear bond strength of a total etch technique using a self-etching bonding system on a dentin substrate.² The composite system used (Majesty ES-2) displayed remarkably smooth handling and aesthetic properties that were perfectly predictable featuring ultimate aesthetics (Figure 14).

References

1. Leonard, R.H. Jr., Bentley, C, Eagle, J.C., Garland, G.E., Knight, M.C. and Philips, C. Nightguard Vital Bleaching: a long-term on efficacy, shade retention, side effects, and patient perceptions. *J Esthet Restor Dent.* (2001). 13(6): 357-369.
2. Erhardt, M.C., Cavalcante, L.M and Pimenta, L.A. Influence of phosphoric acid pre-treatment on self-etching bond strengths. *J Esthet Restor Dent.* (2004) 16(1): 33-40; discussion 41.

About the author

Clarence is originally from Toronto, Canada, where she completed her Doctor of Dental Surgery and General Practice Residency at the University of Western Ontario and the University of Toronto, respectively. Clarence's practice is limited to cosmetic and restorative dentistry and she is well-published to both the local and international dental press, writing articles, reviewing and developing prototype products and techniques in clinical dentistry. She frequently and continually lectures internationally. Clarence is the Chairperson and Director of the New Zealand Academy of Cosmetic Dentistry. She is currently one of two individuals in Australasia to hold Board-Certified Accredited Member Status with the American Academy of Cosmetic Dentistry. Clarence is an Opinion Leader for multinational dental companies Kuraray Noritake, J Morita Corp, Henry Schein NZ, Ivoclar Vivadent, Dentsply Sirona, 3M, Kerr, GC Australasia, SDI and Coltene and is the only Voco Fellow in Australia and New Zealand. She holds Fellowship status with the International Academy for DentoFacial Esthetics and is a passionate and approachable individual, committed to having an interactive approach with patients in all of her cases to maximize predictability.