blog

RESTORATIVE DENTISTRY

by Dr Clarence P. Tam HBSc, DDS

The 'Tam Blog' is an informal conversation intended to inform and to engage further conversation and debate. The NZDA News welcomes comments on the material presented.

The inclusion of this 'Blog' in the NZDA News does not imply promotion or endorsement of the Blog by NZDA. Readers need to use professional judgment to assess the validity and usefulness of techniques, materials, products discussed.

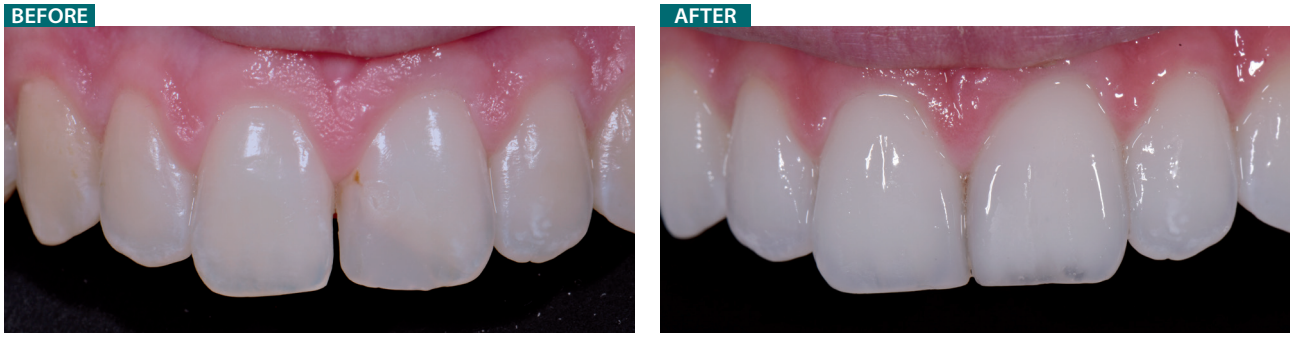

Figure **/1**

Predictable Ultimate Aesthetics: guided minimally-invasive correction of asymmetrical maxillary central incisors using a value-based direct composite layering system

Not all composites are created equal. There is no way of knowing if, for example, a shade A2 composite from manufacturer A is the same colour as a shade A2 composite from manufacturer B or in fact the A2 tab on your Vita Classic shade guide. To solve this problem, Kuraray Noritake developed a Vita-approved aesthetic composite system. Other companies have developed value-based composites and these have become increasingly ubiquitous.

There are three dimensions of colour. Value is the core "black and whiteness" or "brightness" of a particular colour. Value is the most easily-identifiable colour discrepancy when trying to make a single restoration blend with adjacent teeth. The second dimension of colour is chroma. Chroma refers to the degree of colour saturation or "richness" within a particular value family. Finally, hue which is the attribute of a colour by virtue of which it is discernible as red, green, etc. A value-based composite shade selection is based on the 'brightness' aspect of colour whereas a Vita-based system is based on a well-known standard of color shade selection.

A 23 year old female patient was referred to me for the management of asymmetric central incisors and a midline diastema. The mesial incisal edge of tooth 21 had fractured (no pulpal involvement) when she walked into a glass door at 9 years of age. The tooth was restored with composite. She subsequently received orthodontics over a period of 4.5 to 5 years during which time, the restoration had been replaced multiple times and to her dissatisfaction, a diastema had also appeared beside a noticeably translucent, misshapen, and oversized tooth 21MIBL Class IV repair. The socially-active patient desired an invisible restorative replacement with simultaneous closure of the diastema and corrective symmetry of the 11 relative to tooth 21. [Figure 1]

Part of the workup involved baseline photographs and measurements to be used to digitally design the ideal proportions of the final restorations. Smile Designer Pro (Toronto, Canada) is a multi-platform digital smile design software with a simulation function. It was used to guide the development of the ideal proportions, ratios and specific

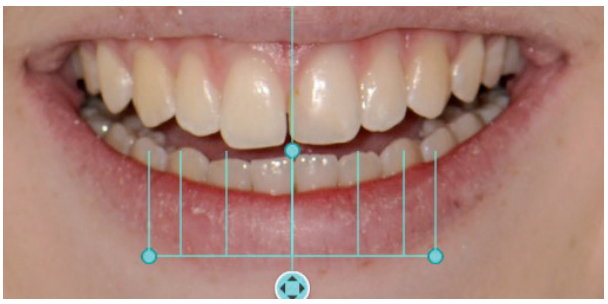

Figure **/2**

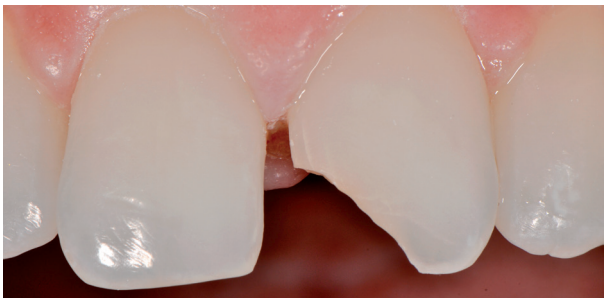

Figure **/3**

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 tooth form and dimension can be easily quantified for transfer to a diagnostic wax-up and ultimately to a putty stent for clinical convenience. [Figure 2]

Vital nightguard bleaching is effective, safe and relatively long-lasting. Leonard *et al* (2001) reported no adverse effects to vital night-guard bleaching in terms of patient symptoms nor adverse effects on dental tissues. The bleaching was maintained in 82% of participants at 47 month review.[1] Following a two-week course of custom nightguard bleaching using 10% carbamide peroxide (Opalescence, Ultradent) and the requisite standdown period of 10-14 days to allow for oxygen dissipation from the teeth, because of time constraints the patient decided to proceed without a diagnostic wax-up and 'trial smile'. The value-based composite system selected was Kuraray Noritake Majesty ES-2.

PREPARATION DAY. Kuraray Majesty ES-2 Premium shade guides were used to ascertain the enamel, dentine 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 anaesthetized and the old Class IV restoration removed [Figure 3]. The teeth were isolated using a curved serrated metal strip (Komet) to protect the adjacent teeth. 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. The Digital Smile Design specified a 0.4mm extension of tooth 11 into the midline diastema, and thus this dictated the dimension of the 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 tooth 11 measured with callipers to ensure optimal mesiodistal symmetry with tooth 21. The Mylar strip was placed on the lingual axial aspect of tooth 21 and the lingual shelf built to a thickness of 0.3mm, extending facially to the mesiofacial line angle. The join line was addressed next. Two layers of A1 Dentin (A1D) were placed with the second layer extending incisally and featuring dentine lobule irregularity and small connections to the incisal edge. Following placement of a thin layer of Translucent Clear within these dentine fingerlings incisally, a thicker worm of Translucent Amber was placed at the incisal edge and brushed into place. At this stage, the join line was invisible but we still had space for additional dentine volume, needed to brighten the value of the restoration. 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). Finishing and polishing was completed using an Astrobrush (Ivoclar Vivadent) and 1 micron aluminium oxide paste (Enamelize, Cosmedent) in conjunction with Flexibuff discs (Cosmedent).

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 [Figure 5].

Figure **/4**

Figure **/5**

Dr Clarence Tam DDS

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 mostly limited to cosmetic and restorative dentistry. 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 throughout New Zealand and Australia.

Clarence is the Chairperson of the New Zealand Academy of Cosmetic Dentistry. She is an Accreditation Candidate and Sustaining Member of the American Academy of Cosmetic Dentistry and seeks to be the first in New Zealand and Australia to gain Accredited Status with them. Clarence is an Opinion Leader for Henry Schein Shalfoon, 3M ESPE, Kuraray-Morita, GC Australasia, SDI, Coltene-Whaledent, Dentsply/Triodent/ Rhondium and a Voco Fellow in Australasia.

Clarence maintains a private practice limited to cosmetic and restorative dentistry in Newmarket, Auckland.

contact

For further information please contact Dr Clarence Tam,
e: clarence.tam@gmail.com w: www.clarencetam.co.nz

REFERENCES

1. Leonard RH Jr, Bentley C, Eagle JC, Garland GE, Knight MC, 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