A smile is the first thing we notice when we greet someone. If that person doesn’t smile back, then we become concerned or even wary. But some people don’t smile because their teeth are discolored, crooked, chipped or missing, and they want to hide the defects.

As our patients, we know that they want a beautiful smile. But the dentist also must be concerned with creating a fully functional restoration. Fortunately, tremendous advances in esthetic dentistry allow us to provide patients with an opportunity to achieve both functionality and aesthetics. Here’s the story one such woman and how the dental team restored her smile and her confidence.

**CASE HISTORY**

A woman patient in her 40s was exposed to Tetracycline in early childhood, resulting in intrinsic tooth staining (Fig. 1). The chemical reaction to the Tetracycline eroded 1.5 mm on the lingual of her maxillary anterior (Fig. 2) and severely discolored the facials. In addition, there was excessive wear of the anterior incisal edges.

While the patient was extremely interested in altering the discoloration and shape of her teeth, the dentist’s primary concern was establishing functional occlusion to provide longevity to the restorations and her smile (Fig. 3).

Full crown restorations would ensure uniform protrusive guidance to reestablish her bite and provide sustainable oral health, while creating white, uniform-looking teeth. Because the patient’s gingival tissue was receding, a subgingival margin on the restorations would leave some room for additional gingival movement without producing new discoloration. The patient wanted only to treat the maxillary anterior and would consider restorations on the mandible at a later time (Fig. 4).
TREATMENT PLAN

The dentist elected to use the LSK 121 Treatment Plan Wax-up that I developed to ensure the dental team could have a blueprint for the desired outcome and keep all parties on the same page. The Treatment Plan Wax-up is used to establish occlusion (Figs. 5 and 6), centric stops, a smile line, improved aesthetics as well as provide tooth reduction requirements and pre-plan gingival tissue re-contouring if needed.

Not only is the wax-up an important element of the treatment plan, but also increases case acceptance. By allowing the patient to view the intended results as an accurate 3-D model, the doctor can better explain the treatment procedures, and the patient feels confident that the restorations will appeal to her esthetic requirements. The wax-up further serves as a template for the doctor and as a communication tool for the laboratory.

The wax-up included reductions for proper occlusion (Fig. 7), protrusive guidance (Fig. 8), lengthening the centrals (Fig. 11), lingual morphology with centric stops (Figs. 12 and 13), and lip support (Fig. 14). Once the patient approved the final look of the restorations, a silicone index was created using the wax-up. The silicone index also would be used as for creating the temporaries and preparations.

CLINICAL PROCEDURE

The teeth were prepped with rounded edge shoulder margins (Fig. 15). This preparation conforms to all-ceramic preparation guidelines that call for maintaining 1.2 mm of circumferential room with 1.5 mm at the incisal and no sharp angles. A polyvinyl siloxane impression and final bite registrations were taken. The bite registration consisted of two centric bites and one protrusive bite.

The silicone index made from the LSK 121 Treatment Plan Wax-up was used as a matrix for the temporaries. The patient examined the temporaries to see if any adjustments were needed and communicated those changes to the dentist. The dentist can change the length or shape of the restorations by communicating with the technician on the modifications or take an impression of the temporaries and have a new study model created reflecting the changes.

The dentist and dental technician generated the shade mapping. The patient wanted to change her discolored teeth to a light color. A bleach shade was selected. By combined layering of other colors, a natural-looking appearance would be achieved.

LABORATORY PROCEDURE

The LSK 121 Treatment Plan Wax-up was fabricated to
show the esthetic outcome and to confirm the resulting function of the anterior teeth. Based upon the intended height of contour, the incisors would be lengthened by 2 mm. When examining lateral excursion, canine rise, and other movements, it was discovered that the mandible anterior also would require adjustment; the opposing mandible model was adjusted and marked for the doctor to create the anatomic form of the restoration and the occlusal morphology.

The laboratory selected Procera zirconia for the understructure because of its benefits: Procera zirconia is known for its proven strength, biocompatibility, and esthetic results. While all-ceramic restorations have a higher translucency that shines through to the surface, the zirconium’s opacity blocks out discoloration while possessing the benefits of ceramic restorations.

The technician uses the framework to fabricate the restoration with multi-layered porcelain powders and applied porcelain color build-up. The process involves applying different colors of porcelain powders (Fig 16) onto the crown to bring out the true understructure and generate a warm color that creates a natural, healthy-looking restoration. Without this multi-layering technique, the tooth color would look flat.

The surface texture (Fig 17) is important to further accentuate the natural look of the teeth by influencing what the multi-layered buildup and understructure will look like from different angles.

After completion of the restorations, the dental technician verified that they met all the necessary functional values such as confirming the correct lingual morphology and tooth movements, which create the thickness of the incisal edge. The crowns (Fig. 18) were then sent back to the dental office for insertion.

CEMENTATION

The temporaries were removed and the crowns tried in for the patient to approve. The Procera zirconia is treated like a normal crown. It blocked out the discolored preparation and, while it is technically not a bond, it provided surface roughness that allowed for exceptional cementation strength without requiring special techniques or special cements. The restorations (Fig. 19) were then seated, ensuring proper proximal contact. Once the cement set, the excess was gently removed from the margins. The immediate result from the patient was a long-awaited, joyous smile. After seeing her new teeth, the patient decided that she also wanted her mandibular anteriors completed. Beyond the esthetic outcome, the patient will appreciate the long-term functionality and longevity of the restoration. Her centric (Fig. 20) and lateral excursion (Fig. 21) needed slight adjustments. The laws of predictability (Fig. 22) were followed with an emergence profile, tooth long axis, three-dimensional guideline, color, surface texture, avoided black triangle, incisal silhouette, and lip support. The canine rise (Fig. 23) will be further improved once her mandible teeth are completed.

CONCLUSION

The patient may have been hesitant to smile when she first came to the dental office, but upon leaving, she was smiling (Fig. 24) from ear to ear. Upon recall after six months, the patient’s restoration is strong and beautiful; the patient is still smiling (Figs. 25, 26).