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To Treat or Not to Treat? That Is the Question

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"I know my teeth need work. They are all worn down, but nothing bothers me! My family says I have to do something and I believe that they are right, but I am just not sure. Should I or shouldn't I? What if I'm sorry afterward?"

Patients often consult us seeking our advice and direction in situations where they are unsure of what to do. As artists, we would like to work aesthetic magic and re-create the smile of their dreams so they can live happily ever after. However, as health professionals we must sit back and evaluate carefully the optimal treatment for each patient on a case-by-case basis.

Advancements in dental materials and treatment planning have given us the tools to enable our patients to "try before they buy." They can have a totally clear vision of the changes they will make to their dentition before allowing a handpiece to touch their teeth.

Computer-generated imaging can give a patient an idea of a potential cosmetic change; however, a photo alone often is not sufficient to enable some patients to arrive at a difficult decision.

Recently, dentists have been using a procedure called "a trial smile," where they actually place the projected dental change in the patient's mouth utilizing a bis-acryl provisional material. This material is directly placed over the patient's existing teeth using a silicone template fabricated from a wax projection. The patient is then able to visualize clearly the potential dental change, be photographed with it, and have the assurance that his or her decision is the correct one.

Case Report


Figures 1 and 2. *Severely worn dentition in a 53-year-old patient.*

Robert, age 53, presented with a severely worn dentition (Figure 1). Close-up photos (Figure 2) displayed an occlusion that had worn edge to edge with teeth displaying significant abfraction notching. Two molars on the lower right side and one upper left premolar had been missing for several years. Aside from the need for gingival grafting due to the abfractions, the periodontium was stable.

His longstanding dentist had maintained a watch-and-see philosophy. However, Robert realized that he was ultimately watching his condition get worse, and he believed that something had to be done either to stabilize the current condition or to restore it back to ideal. He had never been presented with different possible treatment alternatives and took it upon himself to seek advice and evaulate his options.

It is imperative for the dental health professional to recognize that many patients are in absolutely no pain, have not had dental problems in years, and do not necessarily dislike their appearance. In Robert's case, he had grown a moustache to blend into a middle-aged persona of a man with worn teeth. His wife, family, and friends had come to know him this way.

A complete exam was performed consisting of a full-mouth series of x-rays, Panorex, periodontal charting, TMJ exam, and study models mounted in centric relation. After carefully studying the case, analyzing Robert's oral health, and visualizing different possible alternatives, we presented him with 2 treatment pathways, if in fact he were to choose to do something.

The first possibility was to replace the missing teeth with dental implants, graft the gingival recessions, and attempt to maintain the remaining dentition in its current state. We would then fabricate for Robert an occlusal guard that he would wear when sleeping.

The second treatment choice was first to stabilize the lower arch in its current dimension, and then to completely restore the opposing maxillary arch by increasing the vertical dimension, which would allow us to recreate tooth form and create an aesthetically pleasing smile.

Robert fully understood the treatment options and the rationale and thought process behind each of them. He fully appreciated that the placement of dental implants would be beneficial to replace his missing teeth. Before deciding what to do with his vertical dimension and the aesthetics of his maxillary arch, he wished to use "a trial smile" for a clear vision of what the intended result would look like in his mouth.


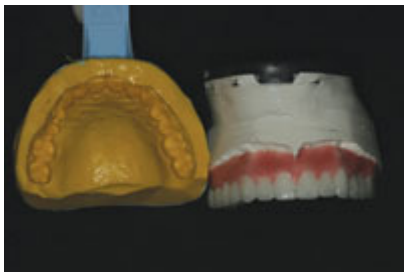

Figure 3. *Diagnostic wax-up.*

Figure 4. *A silicone template was fabricated from the wax-up.*

Figure 5. *Luxatemp was injected into the template.*

Figure 6. *The Luxatemp polymerizes and adheres to the unprepared teeth, resulting in a trial smile.*

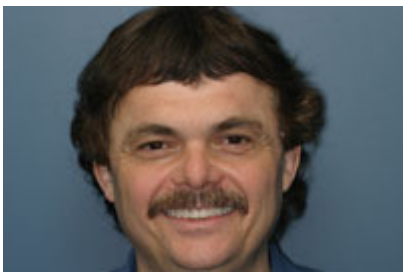

Figure 7. *The new Robert?*

Figure 8. *A little computer imaging does miracles removing graying hair.*

A diagnostic wax-up was created from study models mounted in centric relation on an Artex articulator (Jensen Industries), recreating the dental anatomy of the upper arch (Figure 3). Periodontal probing at the initial examination of the upper anterior teeth yielded a gingival sulcus depth of approximately 3.5 mm, which determined that we could safely remove 1.5 mm of tissue by gingivectomy without violating the biologic width. Now we could lengthen the teeth both gingivally and incisally. Robert also had ample root length and attached gingival tissue to enable us to perform the alterations without consequence to his periodontal health. The gingival levels were adjusted on the model to the ideal, and the incisal one half of each tooth was rebuilt to full form.

A full-arch silicone template (Figure 4) was created from the wax-up, injected with Luxatemp A2 bisacryl provisionalization material (Zenith/DMG; Figure 5), placed directly over the patient's existing teeth, and allowed to polymerize. No anesthesia or preparation of the teeth is required. We allowed the Luxatemp to polymerize and harden, adhering to Robert's teeth. We then removed the silicone template, and he was able to witness the instant metamorphosis of his smile (Figures 6 and 7). The before-and-after images were totally remarkable (Figure 8). Robert now had a clear vision of the potential change, and his mind was convinced that he definitely wanted treatment. He immediately scheduled an appointment to begin.

Zimmer 4.7-mm implants (Zimmer Dental) were used to replace the missing 2 lower molars and upper left second premolar. An Odyssey 2.4G Diode Laser (Ivoclar Vivadent) was used to align the gingival levels, and the teeth were prepared to receive Lava Zirconium restorations (3M ESPE), as we believed that they were best suited to resist Robert's occlusal force. It is imperative that a rehabilitation such as this be restored in cuspid rise and centric relation to prevent occlusal interferences and to decrease the chance of porcelain fractures. These parameters were incorporated into our diagnostic wax-up.

Figure 9. *The Lava tooth preparation. The gingival changes were performed with a diode laser.*

Figure 10. *The teeth were provisionalized with Luxatemp Fluorescence.*

Figure 11. *A happy patient at initial temporization.*

Preparation for Lava restorations requires a shoulder preparation with a rounded internal angle, 1.5 to 2.0 mm of incisal/occlusal reduction, and 1 to 1.5 mm of axial reduction (Figure 9). Impressions of the preparations were taken with Honigum (Zenith/DMG), and the prepared teeth were provisionalized with Luxatemp Fluorescence (Zenith/DMG; Figures 10 and 11). The provisionals were placed in 3 sections so that they could be individually removed at a later date for bite registration. They were allowed to remain in the patient's mouth for several months to ensure that he was comfortable with them dimensionally and visually.

Figure 12. *The magic of well-planned provisional restorations.*

When Robert was totally satisfied with his new prototype restoration, each of the 3 sections was individually removed and his bite was accurately registered with Luxa-Bite (Zenith/DMG), a bis-acryl bite registration material that is extremely hard and accurate. When Robert presented in the office for this appointment, his moustache was gone and he had changed his hairstyle and color, giving him a boyish, youthful appearance. He was delighted with his new look. Photographs and study models were taken of the provisionals. These would enable the lab to fabricate silicone guides to duplicate the provisionals with the Lava restorations (Figure 12).

Historically, dentists have been trying to achieve lifelike aesthetics by utilizing all-ceramic crowns. Porcelain jacket crowns made of feldspathic porcelain were developed more than a century ago. Attempts to reinforce these crowns were achieved with aluminum oxide, leucite (IPS Empress [Ivoclar Vivadent]), mica, or glass-infiltrated mineral oxides (In-Ceram [Vita]). However, none of these systems had the predictability and longevity of porcelain-to-metal restorations.1

In recent years, restorations fabricated from zirconia have been introduced and heralded to be the future. Zirconia offers dentistry enhanced aesthetics (translucency and color) with long-term stability, strength, and biocompatibility. Zirconia is extremely strong and has a high fracture resistance, making it considerably stronger than other ceramic materials. Zirconia absorbs more than twice the load level naturally occurring in the mouth (loads measured for anterior teeth up to 400 N, posterior teeth up to 600 N). Bruxers are able to exert forces of 800 N.2,3

Lava offers excellent aesthetics and translucency,as it consists of a ceramic framework of shaded zirconia with an overlayed porcelain layer. Dental technicians can begin with a natural dentin color of zirconia and then overlay porcelain in a conventional manner, yielding a restoration that is strong, stable, and highly aesthetic, with a marginal fit equivalent to that of ceramo- metal restorations.4,5

In the dental laboratory, the impressions that had been taken at the preparation appointment were mounted on an Artex articulator using the LuxaBite registration material. The working model was first saw-cut and then digitized using the optical Lava scan. Our restoration would be virtually de-signed on a computer monitor using the Lava software (CAD), and then the data would be sent to the Lava form milling unit (CAM). The restoration is then milled, enlarged from a presintered zirconia blank, which can be dentin colored (7 possible shades), and is then sintered to its final density in the furnace. The lab then veneers this framework with porcelain.

Figures 13 and 14. *The detailed Lava restorations ready to be placed in the patient's mouth.*

Using dentin A1 and opalescence enamel porcelain, the build-up was constructed to re-establish the format of the temporaries. The length,

overjet, and function had been determined with the temporaries, so it was very important not to alter them, as they are what the patient had grown accustomed to. Using an incisal edge matrix and guide table made from the mounted temporary models helps to mimic the working function and the format of the temporaries. The surface texture was then applied using a variety of diamond burs before the restorations were placed in the oven for a natural glaze. They were then hand-polished to achieve the appropriate sheen and luster for this particular patient. The restorations were then cleaned and prepared for shipment to the dentist (Fig-ures 13 and 14).

Figures 15 to 17. *The final Lava restorations give Robert a youthful, fresh, new look.*

The strength of the individual Lava crowns is extremely high, making conventional cementation possible and the dentist's life easier. The internal surfaces of the individual Lava units were sandblasted and luted with RelyX Unicem cement A2 shade (3M ESPE). RelyX combines the advantage of adhesive cementation with the simple handling of conventional cementation. It bonds directly to zirconia and to tooth structure, and, after being allowed to dual-cure, is simple to clean up.
The completed Lava restorations were simply an enhanced version of our provisional Luxatemp restorations (Figures 15 to 17). They reflected the look, shape, and form of the prototypes. Me-ticulous treatment planning and a well-made provisional restoration allowed us to achieve predictable results, decreasing the possibilities of patient disapproval. Robert was totally delighted with his new smile. He only had one comment to make, "What took me so long?"

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