Providing optimal long-term provisional fit, function and esthetics with Telio CAD

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As elective dentistry and implant therapy become more popular, provisional restorations are being used for longer durations. Increased restorative procedures have placed new demands on the dental industry for long-term provisional materials that provide optimal function, fit and esthetics for anywhere from weeks to months and sometimes longer. This intermediate phase is crucial for the proper preparation and confirmed success of the final restorative outcome. This article presents two cases in which Telio CAD was used to provide patients with durable, reliable and esthetically pleasing long-term temporaries quickly and efficiently.

Introduction

Because of the rise in elective procedures, temporary restorations are playing an increasingly important role in today’s dentistry. Properly fitted and reliable provisional restorations are relied upon by patients for utility and esthetics, and by dentists to prevent deterioration of the patient’s jawbone and maintain stability in the mouth. A critical phase in restorative procedures, temporary restorations can be required for anywhere from two weeks to 12 months or more, generating the need for dependable, long-term provisional materials suitable for chairside use with CAD/CAM applications and crown and bridge restorations.

As a solution, the new Telio (Ivoclar Vivadent, Amherst, N.Y.) system has been developed featuring three lines of materials for shade and material compatibility. Telio CAD, Telio CS and Telio Lab comprise a system that addresses the needs of dentists, dental technicians and in-office CAD/CAM users. The chairside and laboratory products were designed for compatibility, enabling collaboration between dentists and lab technicians across all phases of treatment.

Telio CAD acrylate polymer blocks can be used with CAD/CAM technology to fabricate long-term temporary crowns and bridges. Telio CAD eliminates the challenges associated with traditional temporization processes, such as polymerization shrinkage, impression errors, mixing errors and...
Demonstrating durable shade stability and lifelike fluorescence, Telio CAD blocks are available in six shades and two bridge sizes, which makes it easy to fabricate provisional restorations, including temporary anterior and posterior crowns, bridges with up to two pontics, temporary restorations on implants and therapeutic restorations for correcting TMJ problems and occlusal adjustments.2 Boasting a high flexural strength of 130±10 MPa and flexural modulus of 3200±300 MPa,4 Telio CAD demonstrates durability and flexibility and, as a result, is considered an ideal provisional restorative material for implants and other clinical situations requiring long-term temporary placement.2

Case presentation No. 1

A patient presented requiring a bridge restoration to replace the lower central incisors (Fig. 1). The laterals were subsequently prepared and a retraction cord was placed. The central incisors were then extracted, and a collagen plug was sutured into place to decrease bleeding and allow for an easier scan (Figs. 2, 3). The anterior teeth were scanned along with the antagonist (Fig. 4). The bridge was then designed in buccal bite with biogeneric software (Figs. 5–7).

Laboratory fabrication techniques

Because of the nature of the case, the temporary restoration was fabricated using a long-term provisional restorative material (Telio CAD, Ivoclar Vivadent, Amherst, N.Y.) according to the steps outlined by the author’s specific CAD/CAM system. For reliable restorative results, manufacturer instructions were adhered to and minimum thicknesses and connector dimensions were observed.3 Telio CAD was the provisional restorative material of choice based on its acrylate polymer (PMMA) blocks, which can be milled on-site, chairside using CAD/CAM technology. PMMA blocks provide the durability and reliability of plastic, making them ideal for the fabrication of long-term temporaries. When milling was completed, the restoration was separated from its holder using a fine tungsten carbide bur; a diamond separating disk may also be used. The restoration was then fitted in the patient’s mouth. Adjustment of the occlusion was made prior to polishing.

Finishing and polishing

The efficiency of this processing technique leads to an esthetic result quickly and easily.5 Any white...
Clinical provisional restorations

Spots resulting from the milling process were removed using a tungsten carbide bur. Fine cross-cut carbide burs were used to finish the restoration, and the cross-cut tungsten carbide bur was also used to smooth out the attachment and perform any necessary shape adjustments. Caution was taken to avoid overheating the material.

The restorations were then tried in the patient’s mouth and carefully finished. The proximal and occlusal contact points were examined before surface grinding the entire occlusal surface with a fine diamond to smooth out the surface structure. Adjustments did not compromise minimum thickness requirements. Because residue from the milling additive may weaken surface bonding, the restoration was thoroughly cleaned before further processing. The restoration was tried in as needed.

For this fully anatomical processing technique, the restoration was polished and incorporated immediately after milling. Polishing reduces plaque accumulation and resulting shade disturbances, making it a prerequisite for an optimum esthetic result. Special attention was paid to crown margins, interdental areas, occlusal surfaces and the basal rest area of pontics. Surface luster was achieved by manual polishing utilizing rotary instruments and polishing paste (Universal Polishing Paste, Ivoclar Vivadent, Amherst, N.Y.). To achieve a lifelike surface gloss, close attention was given to the contact points and margins during polishing. Little pressure was applied, and the corresponding speed was used to avoid heat development.

Rubber polishers and silicone polishing wheels were used to smooth the convex areas of the natural structures, as well as the marginal ridges, to obtain an added luster after high-gloss polishing. Pre-polishing was completed with a handpiece, goat-hair brushes and fine pumice polishing paste (Universal Polishing Paste, Ivoclar Vivadent, Amherst, N.Y.). Next, the restoration was polished to a high gloss using goat hair brushes. Depending on the type of high gloss desired, leather buffing wheels could be used to achieve a high shine, while cotton buffs produce a lower luster.
A low speed and limited pressure was used for optimal results while high-gloss polishing. To successfully polish the interdental areas and occlusal surfaces, the goat hair brush was modified into a star shape. With this modification and given the small size of the brush, only the desired areas were polished.5

After finishing and polishing the restoration, it was tried in with minimal adjustments. When the patient was happy with the esthetics, it was placed with temporary cement (Telio CS Link, Ivoclar Vivadent, Amherst, N.Y.) (Fig. 8). To prepare the restoration for cementation, the inner aspects were blasted with Type 100 Al2O3 at 1 bar/29 psi pressure. Another technique for the cementation of restorations is to roughen the inner aspects with a rough diamond bur.8

The patient was seen one week after the extraction for suture removal (Figs. 9, 10). After six weeks of healing, the final scan for a bridge (Emax Cad-on, Ivoclar Vivadent, Amherst, N.Y.) will be performed.

Case presentation No. 2

A woman presented unhappy with the fixed partial denture spanning teeth #27–29. The bridge was removed and the preparation refined and scanned (Fig. 11). A lower premolar provisional restoration bridge was then designed using the biogeneric software (Figs. 12–14). The temporary was fabricated using a long-term provisional restorative material (Telio CAD, Ivoclar Vivadent, Amherst, N.Y.) in the MCXL milling chamber, according to the steps outlined by the author’s specific CAD/CAM system, and then characterized with color shades (Tetric color, Ivoclar Vivadent, Amherst, N.Y.).

The characterization materials were layered onto the incisal and occlusal area of the reduced, milled restoration. A highly esthetic restoration was quickly and efficiently achieved because of the limited application requirements of the layering material.

For a smooth transition between the temporary restoration material and the characterization material, targeted grinding of the transition areas to the cut-back regions was required, and the stains were applied with a brush in very thin layers of up to 0.2 mm.5 Any other suitable instrument also could have been used. The restoration was then light cured for one minute in a curing oven and finished and polished according to the protocol previously described in case No. 1. Regular hand-held light curing can also be utilized.

The patient has worn the temporary for three and a half months while waiting for the implant to integrate. With the temporary removed, the healing of the implant site could be seen (Figs. 15–18). The temporary showed no signs of wear, and the characterization stains remained steadfast.

Conclusion

The growing necessity for temporary restorations has put high demands on dental professionals to incorporate the use of long-term provisional restorative materials for this vital intermediate step. Temporary restorations are required to provide durability, reliability, accuracy of fit and optimal esthetics.6 The longer the provisional restoration is to remain in the mouth, the more important these characteristics become. With the development of acrylate polymer blocks specifically formulated for use with CAD/CAM technology, impression errors and polymerization shrinkage have been eliminated and lifelike, long-term reliable temporaries can be fabricated with accuracy and ease._

Editor’s note: A complete list of references is available from the publisher.