Solutions for Long-Term Temporization of Partial Coverage Restorations

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Modern-day dentistry promotes conservation of the tooth structure supported by the availability of restorative materials and adhesive systems that have evolved in quality and durability over the years. Ceramic partial coverage restorations are one of the restorative procedures that have regained its importance and dominance in restorative dentistry. Preparation designs may vary and follow specific guidelines honoring conservation of the tooth structure which may defy traditional resistance and retention form commonly provided in crown preparations. Such preparation may require temporization, that may challenge stability and retention, in addition to being relatively thin, pushing the limits of any temporary restoration. Recently, I had the opportunity to conduct research on a recently introduced bis-acryl resin-based material termed by the manufacturer as a "long-term" restorative material, LuxaCrown (DMG America). The science shows that LuxaCrown mechanical properties fall between a traditional composite resin and a hybrid composite-ceramic restorative materials.[1] LuxaCrown is a highly filled bis-acryl resin-based material that provides mechanical strength and wear resistance that may offer a more reliable solution to long term temporization of partial coverage restorations.[1] Moreover, its color stability compared to other resin-based material is impressive.[2] The enhanced mechanical and optical properties require a temporary cement that can complement these properties and retain the partial coverage temporary restoration while the indirect restoration is fabricated, which may require several weeks. Previously, traditional bis-acryl resin and temporary cements failed to support partial coverage restorations, either fracturing or dislodging off the preparation. At times, clinicians were forced to bond the temporary restoration, which can be time consuming upon removal and may inadvertently alter the preparation. The combination of LuxaCrown and TempoCemID (DMG America) is a dynamic duo; a restorative material that is strong, esthetically pleasing and with favorable wear resistance capabilities, combined with a eugenol-free, easy to clean, transparent, and dual-cure setting temporary cement.

Patients suffering from excessive wear of the occlusal surface as a result of attrition and erosion may benefit from a minimally invasive restorative procedure commonly known as overlay, onlay, or occlusal veneer/tabletop. These restorations usually require a reduction of 1-1.5mm of the occlusal surface with a chamfer or butt-joint margin, usually in enamel. This conservative reduction of the tooth structure challenges the temporary restoration in being strong enough to resist occlusal forces and stable enough to avoid dislodgement.

As seen in the photo series, a 1.2mm reduction of the occlusal surface was provided for worn mandibular molars. A modified-shoulder margin was provided creating a 1mm axial wall. LuxaCrown was selected to temporize the preparation based on its mechanical properties and was made from a pre-operative silicon impression. TempoCemID was used as a temporary cement to retain the restorations. The cement was light-cured to expedite setting and was easy to clean around the margins. The temporary restorations were in-place for 6 weeks until the final ceramic restorations were bonded.

References:

1. Sulaiman TA, Suliman AA, Mohamed E, Rodgers B, Altak A, Johnston WM. Bisacryl-, composite-, ceramic- resin restorative materials: A comparative study of mechanical properties. In press, Oper Dent 2021.
2. Sulaiman TA*, Suliman AA, Mohamed EA, Rodgers B, Altak A, Johnston WM. Optical properties of bisacryl-, composite-, ceramic-resin restorative materials: An aging simulation study. J Esthet and Rest Dent 2020 Sep 8. DOI: 10.1111/jerd.12653.

Figure 1

Figure 2

Figure 3

Figure 4