TheraCem® Ca Case Study

Courtesy of Joseph Kim, DDS, JD, FAGD, FICOI

Figure 1

Figure 2

Figure 3

Figure 4

Indirect restorative materials have evolved rapidly over the past few years, providing clinicians with a variety of options to better serve their patients. However, more choices have often been accompanied by more steps in the cementation protocol, usually with specific and additional procedures that address the peculiarities of the chosen material. For example, improved retention strengths often come with increased technique sensitivity and chair time to deliver the restoration.

Dental cement technology represents one of the major advancements in restorative dentistry. For over a century, older cements such as zinc phosphate and zinc oxide eugenol allowed for predictable retention of indirect restorations, with various formulations still in use today. However, these materials may require protective measures in deeper preparations to avoid pulpal irritation, and are susceptible to dissolution in water. In 1968, glass ionomer cements were invented, allowing adhesion between metals and enamel and dentin, among other desirable properties.[3] However, while this cement is easy to use, it is also water soluble, and even modern resin modified varieties ideally require at least 15 minutes of protection from moisture contamination after placement.[2]

While resin cements exhibit excellent retention, technique sensitivity has limited their use largely to preparations where maximum retention or esthetics is necessary. However, with advances and simplification of bonding protocols, resin cements have become more popular due to the high retention bond strengths which are achieved through micromechanical and chemical adhesion. Bonding is required for certain substrates often due to fragility or minimal surface area available for adhesion to the tooth. This includes composite and ceramic inlays and onlays, and for full coverage restorations that may exhibit compromised angulation of the preparation or minimal height. Unlike most other cements, resin cements are insoluble to water and oral fluids.

Traditionally, resin cements required preparing the tooth by etching, priming, curing, soft tissue management to stop any bleeding, and isolating the tooth from moisture. These steps were time consuming and often the tooth was not optimally prepared due to technique sensitivity, such as excessive etching and desiccation of the dentin. Also, subgingival margins were often difficult to manage after exposure to the etchant and again after application of the adhesive, which would often result in bleeding.

Self-adhesive resin cements offer a simple solution to the traditional compromise between retentive bond strength and technique sensitivity. By combining the benefits of bonding with a cementation protocol that is easier than for traditional cements, self-adhesive resin cements provide superior retention with maximum simplicity. The self-adhesive feature means there is no need to apply etchant, primers, or adhesives to the prepared dental surfaces. This translates to greater predictability in preparations with subgingival margins, where etchants or bonding agents may cause bleeding.

BISCO's latest resin cement advances this concept with the addition of chemical protection at the margin and universal adhesion to all popular substrate materials. TheraCem Ca is a dual-cured, calcium-releasing, self-adhesive resin cement indicated for luting crowns, bridges, inlays, onlays, and all types of posts. Delivering a strong bond to Zirconia and most substrates, along with easy clean up and high radiopacity, TheraCem Ca offers clinicians reliable and durable cementation of most indirect restorations. Due to innovative chemistry, TheraCem Ca achieves a high degree of chemical conversion, which ensures long term durability, without the need for refrigeration when it is not being used. For clinicians, this means that peace of mind can be nearby and ready to use in every operatory.

In the first case, a tooth with a subgingival margin preparation has been cleaned with an ultrasonic scaler and is gently dried in preparation for cementation. Note how the margin goes deeper subgingivally on the distofacial. (Figure 1) With TheraCem Ca, a clean, prepped dentin or enamel surface is all that is needed to achieve excellent bond strengths, with the addition of sustained calcium release.

TheraCem Ca exhibits minimal resistance to seating, but is not runny. (Figure 2) Clean up is easy with hand instruments and floss. (Figure 3) Compared to traditional bonding strategies, TheraCem Ca makes tissue management less stressful for deeper subgingival margins, although the margins should be thoroughly inspected to ensure complete removal of excess cement. (Figure 4)

In the second case, an implant was restored with a CAD/CAM custom abutment and a cement retained, full contour zirconia crown. Because TheraCem Ca bonds to both titanium and zirconia, it was chosen to maximize retention of the crown to the relatively short abutment. The screw access of the abutment was partially obturated with PTFE tape, leaving room for an air gap, in order to minimize cement from flowing subgingivally. (Figure 5) The crown was minimally filled with TheraCem Ca and delivered onto the abutment. (Figure 6) The TheraCem Ca was tack cured with a 3 second light exposure on the facial and palatal sides. Due to the self-adhesive properties and easy clean up of TheraCem Ca, the total chair time for delivering the abutment and crown was less than 10 minutes. (Figure 7)

In both of these cases, where subgingival margins were present around the preparation and abutment, TheraCem Ca was simple to use, easy to clean up, and did not require etching and priming the tooth or abutment prior to cementation. This resulted in a measurable decrease in chair time and frustration for both clinician and patient. In addition, the high bond strength, insolubility, and sustained calcium release of TheraCem Ca will provide predictable long-term service.

Figure 5

Figure 6

Figure 7

----

[1] Schulein TM. Significant Events in the History of Operative Dentistry. Journal of the History of Dentistry. 2005;53(2):63-72.

[2] Weiner R. Liners, bases, and cements: Material selection and clinical applications. Dentistry Today. 2005;24(6):66-72.

[3] Sidhu SK, Nicholson JW. A Review of Glass-Ionomer Cements for Clinical Dentistry. Tsoi JK, ed. Journal of Functional Biomaterials. 2016;7(3):16.