

Simplicity and Versatility in Cementation

Resin-modified glass-ionomer cements give clinicians a choice for making restoration placement easier with less postoperative sensitivity.

By Robert G. Ritter, DMD

In the past, cementation was at times a tedious and error-prone process. Before the introduction of resin-modified glass-ionomer (RMGI) cements, most restorations were placed with zinc phosphate, zinc oxyphosphate, zinc polycarboxylate, or original traditional glass-ionomer cement. Each of these options presented challenges for use. Issues such as postoperative sensitivity, lack of fluoride release, poor bond to tooth structure, and difficulty mixing were associated with the use of these products and sometimes compromised clinical success.

However, the introduction of RMGIs represented a breakthrough in cementation, giving clinicians an easy-to-use choice that also offered low postoperative sensitivity. RelyX™ Luting Cement from 3M ESPE (www.3mespe.com), introduced in 1994, gained a strong following for its handling and clean-up properties and low incidence of sensitivity. More recently, its successor, RelyX™ Luting Plus Cement, has built on the positive attributes of RelyX Luting cement, and added to them the benefit of simplified mixing with a paste-paste system. With 15 years of clinical history, RelyX cements have the track record to give clinicians confidence in their use.¹

Improving Delivery

RelyX Luting Plus cement, introduced in 2004, features two key innovations



ROBERT G. RITTER, DMD
Private Practice
Jupiter, Florida

that make it a step up from the previous version: an improved delivery mechanism, and a change from a powder/liquid to a paste/paste system. The first generation offering of RelyX Luting cement was a hand-mixed powder/liquid system, which, while relatively easy to use, also presented a few challenges with dispensing the proper ratios of powder and liquid. Furthermore, because powder can be sensitive to contamination or moisture uptake, the setting properties of the original cement were sometimes negatively affected.

The need for greater consistency and greater ease of use was met with RelyX Luting Plus cement, which reformulated the product into a paste/paste system that was dispensed with the Clicker™ Dispenser from 3M ESPE. The Clicker dispenser simplified the process of mixing by automatically dispensing the proper ratios of each component. After mixing by hand for 20 seconds, the cement achieves a mousse-like consistency that makes it easy to load into a restoration.

Strong Bonds, Fluoride Release, and Easy Clean-Up

As a resin-modified glass-ionomer

cement, RelyX Luting Plus cement offers the benefits of fluoride release and a molecular bond to the tooth structure. The cement's formula helps it to sustain its fluoride release, with testing showing the fluoride release continuing for up to 181 days. Additionally, the enhanced marginal integrity helps to ensure long-term success in the mouth. Although traditional glass-ionomer cements can sometimes lead to postoperative sensitivity, RMGIs can be used to effectively seat restorations without this issue.

Rigorous testing has shown RelyX Luting Plus cement to provide strong adhesion and shear bond strength to both dentin and enamel. In addition to natural tooth structure, the cement also has shown positive results in tests of bonding to core build-up materials such as amalgam, glass ionomer, and composite resins. Furthermore, its bonding ability to restorative substrates—including metal, alumina, and zirconia—also has been positively demonstrated.¹

As clinical testing has shown, RelyX Luting Plus cement offers versatility for use with porcelain-fused-to-metal (PFM) crowns and bridges; metal crowns, bridges, inlays, and onlays; strengthened core all-zirconia or all-

alumina ceramic crowns and bridges; prefabricated or cast posts; and orthodontic appliances, making it a strong choice for a routine cement. As the majority of restorations placed in the United States are still traditional PFM and gold restorations, a compatible cement with simplicity and ease of use is a valuable item in the dental office.

RelyX Luting Plus cement's ease of clean-up is a unique attribute that helps simplify cementing procedures. Approximately 3 minutes after a restoration is seated with RelyX Luting Plus cement, the cement changes into a waxy consistency that allows excess material to be removed easily with an explorer or curette. The pieces release from restorations easily and can be quickly cleaned away.

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FIG. 1



FIG. 2



FIG. 3

PREOPERATIVE VIEWS (1.) Buccal preoperative view of tooth No. 13. **(2.)** Occlusal view of fractured cusp. **(3.)** The provisional and excess provisional cement are removed.



FIG. 4



FIG. 6



FIG. 5



FIG. 7



FIG. 8



FIG. 10



FIG. 9



FIG. 11

PREPARING THE CROWN (4.) The final PFM crown on the solid model. **(5.)** The mixed RelyX Luting Plus cement. Note the creamy uniform consistency after mixing.

PREPARING THE CROWN (6.) Loading the cement into the PFM crown. **(7.)** The crown is seated onto the preparation, and the cement is displaced 360°.

FINAL RESTORATION STEPS (8.) The excess cement is removed after 3 minutes. **(9.)** Occlusal view of removal of excess cement. Note the dislodgment of one large piece lingually.

FINAL RESTORATION STEPS (10.) Immediate clean-up of the cement. **(11.)** The final PFM restoration, permanently cemented into place with RelyX Luting Plus.

Case Presentation

The following case illustrates the simple use and easy clean-up of RelyX Luting Plus cement. The patient, a 79-year-old man, presented with a fractured cusp on tooth No. 13 (Figure 1 and Figure 2). The existing gold foil restoration had underlying recurrent decay, necessitating the placement of a PFM crown. The patient was anesthetized and the tooth was prepared and provisionalized with Protemp™ 3 Temporization Material (3M ESPE). 3M ESPE recently introduced Protemp™ Plus Temporization Material as a replacement for Protemp 3.

After 3 weeks, the patient returned to the office for placement of the final crown. The provisional was removed (Figure 3) and the PFM crown (Figure 4) was tried in the mouth, with attention paid to occlusion, contacts, and marginal fit, and excellent adaptation was verified.

The crown was removed and the internal aspect was microetched using 50- μ m alumina oxide powder. The tooth was isolated using dry angles and cotton rolls and an antimicrobial was applied to clean and eliminate any surface bacteria. The tooth was lightly dried. To cement the crown, RelyX Luting Plus Cement was dispensed from the Clicker Dispenser and mixed with a spatula for 20 seconds (Figure 5), then loaded into the crown (Figure 6). The crown was placed in the mouth and the patient

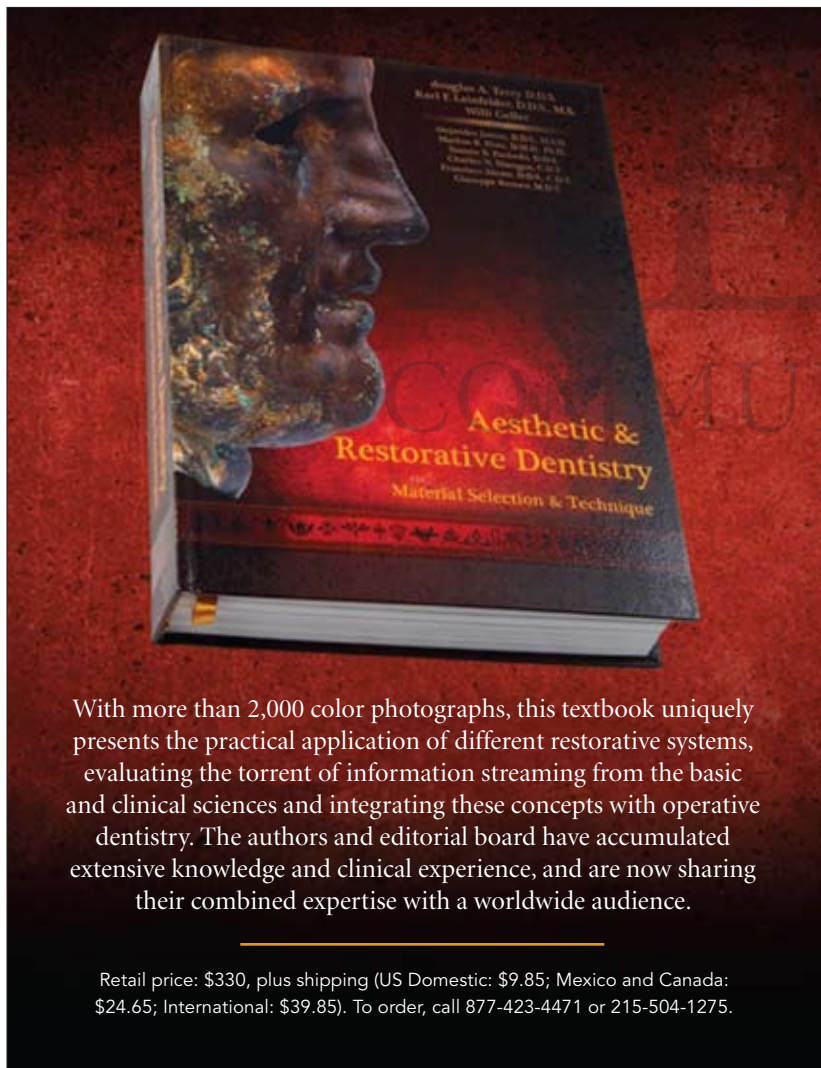
was instructed to close on a bite stick (Figure 7). After 3 minutes, the excess cement changed to a waxy consistency, and was easily removed from around the crown (Figure 8 and Figure 9). The contacts were flossed to remove any interproximal cement. After allowing 5 minutes from the cement's placement in the mouth, the restoration was finished (Figure 10 and Figure 11).

Conclusion

Dental materials that assist the dentist by removing guesswork and simplifying application and clean-up are an invaluable tool in the practice. 3M ESPE has given dentists a simple, reliable, and versatile option for cementation with RelyX Luting Plus cement. Its measured dispensing with the Clicker Dispenser helps to ensure proper mixing ratios, and its helpful consistency—first mousse-like, then changing to waxy for clean-up—makes it an ideal material for routine cementations. Finally, the material's long history of success should assure dentists of its excellence.

Reference

1. RelyX Luting Cement/RelyX Luting Plus Cement Technical Product Profile. Available at: http://solutions.3m.com/wps/portal/3M/en_US/3M-ESPE/dental-professionals/products/category/cement/relyx-luting-plus.



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