3M™ RelyX™ Luting Cement with Procera® AllCeram Crowns

An Update

BACKGROUND It has been reported that the expansion of resin-modified glass ionomer luting cements can fracture all-ceramic crowns. To address this reported problem, at least in part, a retrospective clinical study has been undertaken to evaluate Procera® AllCeram crowns cemented with 3M™ Vitremer™ Luting Cement, amethacrylate modified glass ionomer now named 3M™ RelyX™ Luting Cement. The retrospective study is being conducted in cooperation with Nobel Biocare, Göteborg, Sweden and Lord's Dental Studio[1], Green Bay, WI.

PURPOSE The purpose of the study is to determine the retention of Procera® crowns cemented with the 3M luting cement, whether any fractures have occurred in the crowns, whether patients with the crowns have experienced any post-placement sensitivity and if the aesthetics of the crown has in any way been compromised by the 3M luting cement.

METHOD In October through December 1997, Lord's Dental Studio conducted a study in which 302 Procera® crowns were placed by fifty of their client dentists. Dentists were selected based on prior favorable experience with both porcelain-fused-to metal and all-ceramic restorations. Parameters of the evaluation included fit of the restoration, shade match, amount of occlusal adjustment, contact accuracy, marginal integrity,aesthetics, seating time, impression material used and bonding/cementation used. Lord's Dental Studio compiled the data collected from the study into a comprehensive database. In late 1999 using the Lord's database, 3M selected the dentists whom had cemented Procera® crowns using 3M Vitremer luting cement, a total of thirteen dentists and 45 Procera®/Vitremer luting cement crowns. These dentists were contacted and asked to recall patients and evaluate the subject restorations relative to retention, fracture, postoperative sensitivity and aesthetics.

RESULTS To date, twenty-two Procera® crowns cemented with Vitremer luting cement have been evaluated in this retrospective study. Nine dentists placed the crowns in twenty patients. Seventy-seven percent were placed on posterior teeth and twenty-three percent on anterior teeth. Thirteen or fifty-nine percent were placed in the maxillary arch and nine or forty-one percent in the mandibular arch.

Retention of the crowns is one-hundred percent with the exception of two crowns. Two anterior crowns on teeth 8 and 9 in one patient were replaced about six months after initial placement. At that time, the crowns were performing well as was the cement. With the one stated exception, the retained crowns now average 25.1 months in service.

Of the twenty-two crowns evaluated to date, only one has been reported to have a fracture. This was described as a very slight fracture in the porcelain approximately 1mm by 1mm along the lingual gingival margin. The fracture has not been judged to be cause for replacement and the crown remains in place.

Only three patients have reported sensitivity with their Procera® restoration. In two patients, the sensitivity was resolved without intervention within two to three days. A third patient has reported some sensitivity to cold. The patient has extensive gingival recession and it is believed the recession is more contributory to the cold sensitivity than is the cement or any other factor.

CONCLUSION Based on the findings of this retrospective clinical evaluation to date, it is concluded that RelyX luting cement (Vitremer luting cement) is acceptable for cementing Procera® AllCeram crowns.

Fracture Incidence of Procera® Copings Cemented with Resin-reinforced Cements. MD Snyder, ME Razzoog, MJ Jaarda. Abstract 2979, J Dent Res Vol. 78 (Spec Issue Abstract of Papers) 1999:478.

PURPOSE It has been reported that the expansion of resin-reinforced glass ionomer cement may cause fracture of all-ceramic crowns. The purpose of this study was to determine if fracture would occur using Procera® aluminum oxide copings, the sub-structure for Procera® all-ceramic crowns, and the resin-reinforced glass ionomers, Fuji Plus and Vitremer luting cement as the luting agents.

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[1] *Lord's Dental Studio is a full service dental laboratory located in Green Bay, WI, specializing in new technologies and continuing education for dentistry. They can be contacted at 920/499-0411 or visited at their website, www.lordsdental.com.*

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METHOD Procera® aluminum oxide cores were cemented to pre-milled titanium standardized dies using the two resin-reinforced luting cements. Fifteen samples were prepared using each cement. The samples were stored for six weeks in 100% humidity at room temperature of approximately 700° F. Two prosthodondists and the investigator using 2.5X and 20X magnification respectively then inspected the samples.

RESULTS None of the 30 samples showed any signs of fracture by either inspection method.

CONCLUSION It was concluded that under the conditions of this study, there is no evidence to support the hypothesis that expansion of the resin-reinforced glass ionomer cements tested caused fracture of Procera® all-ceramic copings.

In vitro study of fracture incidence and compressive fracture load of all-ceramic crowns cemented with resin-modified glass ionomer and other luting cements. Chalermpol Leevailoj, DDS, et.al. J Prosthet Dent 1998;80:699-707.

PURPOSE Anecdotal reports have linked resin-modified glass ionomer luting agents with post-cementation fracture of all-ceramic crowns. The purpose of this study was to evaluate the fracture incidence of In-Ceram and VitaDurAlpha porcelain jacket all-ceramic crowns luted with five luting agents.

METHOD Fifty human maxillary premolar teeth were prepared for each ceramic system and divided into five groups of ten teeth each and cemented with the five luting agents (Fuji I, Fuji Plus, Vitremer luting cement, Advance™ and Panavia® 21). Specimens were stored in 0.8% NaCl solution and observed for fracture lines and crack initiation at storage times up to 2 months.

RESULTS Only all-ceramic crowns cemented with Advance fractured during the 2-month observation period. Porcelain jacket crowns were found to fracture earlier and more frequently than In-Ceram crowns. Cracks initiated at the crown margin and multiple crack lines were found as the storage time increased.

CONCLUSIONS The investigators concluded that for the cements studied, only crowns cemented with Advance demonstrated fracture during the 2-month storage period. Results for the true resin-modified glass ionomer cements do not support anecdotal reports of fracture of all-ceramic crowns cemented with these materials.

For updated information, contact your local 3M Dental sales representative.

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70-2009-2168-5