Using Margin Elevation With Bonded Ceramics: A Case Report

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ABSTRACT

Thirty years ago, glass ionomer was first used as a means of bonding resin matrix composite to dentin. Today this method is used to elevate the margin of a preparation to a level which gives the clinician more access to the operating field. This technique has been described in the dental literature with resin composites bonded with resin adhesives. There are still inherent problems with this approach. Since resin adhesives are subject to hydrolysis, marginal leakage, and recurrent caries. Studies have demonstrated the ability of glass ionomer to chemically bond to dentin. Resin composites can predictably bond to etched glass ionomer, eliminating the problem of hybrid layer hydrolysis which occurs with resin bonding agents. Margin elevation takes advantage of the favorable properties of glass ionomer cements (adhesion through chemical bond to dentin, fluorid release, biocompatibility, coefficient of thermal expansion similar to tooth structure, and decreased interfacial bacteria penetration/caries activity) while allowing overlaying of a suitable direct or indirect restorative material. This technique should be utilized when a preparation stands an increased risk of contamination or has a gingival margin on dentin. This case describes restoration of a tooth with a deep subgingival margin located on cervical dentin. The tooth was prepared for a ceramic onlay. Resin-modified glass ionomer was then inserted into the mesial proximal box and re-prepared with the orificial wall of the glass ionomer becoming the new gingival margin, allowing significantly increased access and isolation. The tooth was then restored with an e.max onlay and cemented with RelyX Unicem. The restoration has been examined at 6-month recall. With proper case selection and attention to detail, glass ionomer margin elevation is an excellent technique for improving the predictability of restorative procedures.

MATERIALS AND METHODS

The patient presented to the IUSD Graduate Operative clinic with the chief complaint “I have a chipped back tooth that has been that way for a few months.” After performing palpability tests the pulp was determined to be vital. Clinical and radiographic findings revealed a defective MO resin composite restoration on #31 (Photos 1,2) with recurrent decay and a fractured mesioangular cusp. After removing the defective restoration and all caries, the mesiogingival margin was 2-mm subgingival and located on cervical dentin (Photo 3). After placement of a well-adapted matrix band the preparation was conditioned with polyacrylic acid (GC Cavity Conditioner, GC America) for 10 seconds, rinsed, and blotted dry. Resin Modified Glass Ionomer (Fuji II LC, GC America) was inserted into the preparation and light cured for 20s with a Quartz-Tungsten-Halogen curing light. The RMGI was cut back to the height of the gingival margin and the preparation refined (Photo 4). Following margin elevation with RMGI a polyvinyl dimethacrylate impression was made with light and heavy body material (Aquasil Ultra XLV, Aquasil Ultra Rigid Tray Material, Dentsply Caulk). The tooth was provisionally splinted to #30 which was prepared to receive a PFM crown. A rubber dam was placed to isolate the tooth (Photo 4) #31 was cleaned with a chlorhexidine acid (GC Cavity Conditioner, GC America) for 10 seconds, rinsed, and blotted dry. Resin (Unicem, Colgate) was mixed with light and heavy body material (Unicem, Colgate). The resin was placed on #31 (Photos 1,2) with recurrent decay and a fractured cusp. After removing the defective resin composite restoration on #31, the tooth was prepared for a ceramic onlay. Resin-modified glass ionomer was then inserted into the mesial proximal box and re-prepared with the orificial wall of the glass ionomer becoming the new gingival margin, allowing significantly increased access and isolation. The tooth was then restored with an e.max onlay and cemented with RelyX Unicem. The restoration has been examined at 6-month recall. With proper case selection and attention to detail, glass ionomer margin elevation is an excellent technique for improving the predictability of restorative procedures.

REFERENCES


ACKNOWLEDGEMENTS

Thanks to my faculty mentors Dr. Blaine Cook and Dr. Ori Capin who provided guidance on this case. As always, a special thanks to the Graduate Operative Clinic Coordinator Judy Haines for her assistance during clinical procedures and photography.