



Mechanism and chemistry of G-CEM ONE™ Why efficient even in challenging clinical situation such as CAD/CAM restoration

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Eight years have passed since CAD/CAM hybrid resin crowns were covered by National Health Insurance system of Japan in 2014. Initially, the insurance coverage area, was limited to premolar, in 2016 it was expanded to include molars for patients with metal allergies and from 2017 mandibular first molars for all patients was also included. Maxillary first molars and anterior teeth in 2020 were the next part included in the insurance, and in April 2022, inlays were also covered. Although the application of CAD/CAM hybrid resin restorations continues to expand as a metal-free treatment, some clinical problems have been reported since the start of application in 2014. Especially, early crown debonding has been frequently reported, with some literatures reporting several percent debonding rate observed in clinical studies.

In fact, CAD/CAM hybrid resin crowns have limitations compared to conventional cast crowns in terms of abutment formation methods and prosthetic thickness due to differences in the physical properties of the material and its fabrication process. It is believed that the shape and fit of the prosthesis obtained from this process and cement bonding properties to the CAD/CAM hybrid resin crown affects its clinical performance. In particular, CAD/CAM hybrid resin crowns have limitations to accurately reproduce the details of less than 1 mm on the inner surface of the crown due to the thickness of the machining bar. Since the cement layer in CAD/CAM hybrid resin crowns is thicker than cast crowns, it may affect cement bonding effectiveness. Therefore, to achieve a functionally stable CAD/CAM hybrid resin crown restoration, a new resin cement bonding mechanism that is not affected by the thickness of the cement layer is required.

To solve this problem, GC has developed G-CEM ONE, a bonding mechanism that provides stable bond for CAD/CAM hybrid resin crowns or other challenging Prosthodontic restorations. In this presentation, I will discuss the history of GC's resin cement development and explain the bonding and curing mechanism of G-CEM ONE and its effectiveness for CAD/CAM restorations.

<Curriculum Vitae>

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