

A study of marginal fidelites and fracture strength on IPS Empress 2 ceramic crowns according to three different cement types

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There has been increasing use of IPS Empress 2[®] system owing to easy fabrication method, high esthetics similiar to natural teeth, good marginal accuracy, and sufficient fracture strength. However, in clinical application, although a luting agent and the tooth cementation bonding procedures influence the marginal accuracy and fracture strength of restoration, there has been a controversy in the selection of proper luting agent.

This study was to evaluate the marginal fidelites and the fracture strength of IPS Empress 2[®] crowns by using three different cement groups. The cements investigated were; the Protec cem[®], the Variolink II[®], and the Panavia 21[®]. After construction of 12 experimental dies for three group, IPS Empress 2[®] crowns were fabricated and luted on the metal master die prepared on the maxillary right premolar. The marginal gaps was analyzed before cementation and after cementation microscopically. The fracture strength was measured by subjecting the tensile load to buccal incline on the functional cusp of specimens until the catastrophic failure.

The results of this study were as follows:

1. A significant difference was found between the marginal accuracy before cementation and after cementation depending on three cement types. ($p < 0.05$)
2. The difference in the results from the marginal accuracy of three cement groups was not statistically significant. ($p < 0.05$) However, Protec cem cement group tend to show better marginal accuracy than other cement groups followed by Variolink II[®], and Panavia 21[®].
3. The difference in the results from fracture strength testing using three cement groups proved to be statistically significant ($p < 0.05$). Among Variolink II[®], Panavia 21[®], and Protec cem cement groups, Variolink II[®] cement group had a higher fracture strength than other cement groups.

We concluded that Variolink II[®] resin cement was acceptable in using IPS Empress 2[®] system. However, in clinical application, a luting agent and tooth cementation bonding procedures must be selected with care.