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**Microleakage of laminated veneers fabricated from
two different all-ceramic CAD/CAM materials
bonded to teeth with different class V restoration
(A comparative *in-vitro* study)**

A Thesis

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Abstract

The success of porcelain laminate veneer is assessed by their longevity, sealing ability in the oral environment. Microleakage is considered to be a major factor influencing the longevity of dental veneer restorations especially at the cervical margin. The purpose of this in vitro study was to evaluate and compare the cervical microleakage of porcelain veneer restorations fabricated from two types of all-ceramic CAD/CAM materials bonded to teeth with different class V composite restorations.

Forty-eight sound, crack free human upper first premolar teeth extracted for orthodontic purposes were selected for this study. Teeth were divided randomly into two study groups: group A (IPS e.max CAD veneers) and group B (Cerec CPC veneers), which further subdivided into three subgroups (n =8 sample each): Group A1, B1: with CL V cavity filled with Filtek Z350 composite filling, Group A2, B2: with CL V cavity filled with Ceram·X composite filling, Group A3 B3: with CL V cavity left to be filled with luting resin cement only. The dimensions of the CL V cavity were (4 mm mesiodistally, 2 mm occlusocervically and 1.5 mm depth). All the veneers were fabricated by CAD/CAM technology using Trios 3 shape intraoral camera (3Shape, Copenhagen, Denmark) to get digital impressions, and were milled using CEREC MC XL and inLab SW 16.1. Porcelain veneers were cemented in place using light-cured resin cement (RelyX Veneer Cement); the specimens were then stored at 37° in distilled water for 2 weeks. After that, thermocycling procedure (500 cycles of 5-55 °C) was done. The specimens were then immersed in 2% methylene blue dye for two days, then mounted in clear acrylic before sectioning with microtome. The means of cervical microleakage were recorded using digital microscope and ImageJ program.

The results were checked for normality of distribution (Shapiro-Wilk test) and were analyzed with two-way ANOVA and LSD tests. The statistical

analysis of the results showed that the type of ceramic restoration and composite filling had a highly significant effect on cervical microleakage and the interaction between the main factors was also highly significant. The results showed that the lowest mean of cervical microleakage sum was recorded for group B3 (1056.28, \pm 170.43) which considered statistically significant compared to group B1 (1495.03, \pm 218.74), B2 (1564.45, \pm 208.19) and highly significant compared to group A1 (3180.71, \pm 860.41), group A3 (1837.43, \pm 369.21) while group A2 recorded the highest mean of cervical microleakage sum (3210.04, \pm 486.5).

In conclusion, the type of ceramic restoration and the type of class V composite filling both had highly significant effect on cervical microleakage mean. Cerec CPC veneers had significantly lower microleakage mean as compared to IPS e.max CAD veneers. The groups with class V composite cavity that filled with two different types of composite filling had significantly higher microleakage mean as compared to groups with class V composite cavity filled with the luting resin cement only during cementation.

Clinical significance was that removal of class V composite restoration before the preparation for veneers and leaving the class V cavity to be filled with the luting resin cement only during cementation of porcelain veneers.