

ABSTRACT

Comparative evaluation of marginal and internal adaptation of Class II Zirconia ceramic inlays Vs Feldspathic ceramic inlays with and without a resin base and different interface treatments- an in vitro scanning electron microscopic study.

Aim: The aim of this in vitro study is to evaluate and compare the marginal adaptation and internal adaptation of Class II Zirconia ceramic inlays to Feldspathic ceramic inlays with and without a resin base and different interface treatments using Scanning Electron Microscopic analysis.

Methodology: 40 extracted lower mandibular teeth were selected and cleaned and stored in 0.1% thymol solution at 4°C and they were embedded in tooth coloured acrylic resin. All the forty teeth were divided into 4 groups of 10 teeth each. The Group 1A had Zirconia ceramic inlays with a flowable composite base, Group 1B had Zirconia Ceramic inlays without a base, Group 2A had Feldspathic ceramic inlays with a flowable composite base and Group 2B had Feldspathic ceramic inlay without a base. Class II MO cavity preparation was done in all the teeth and flowable composite resin base applied on the pulpal floor and axial wall alone for group 1A and 2A. The groups 1B and 2B served as control groups. The group 1 inlays were fabricated with Zirconia inlays by CAD/CAM and the group 2 inlays were fabricated by hot-pressing of Feldspathic ceramic. The under surface of the inlays underwent sand blasting using 27µm of aluminium oxide particles at 2

bar pressure and the cavities underwent soft air abrasion interface treatment with 100µm sodium bicarbonate particles at 3 bar pressure. The inlays were luted with dual cure resin cement under 5kg mechanical load with a dental surveyor. The samples were left for 24 hours for complete polymerization and the teeth samples were embedded in clear acrylic resin. The samples were sectioned mesio-distally using diamond discs and they were subjected to Scanning electron microscopic evaluation for marginal and internal adaptation of all the inlays. The values were recorded and tabulated

Result: One-way ANOVA and Post hoc Tukey HSD tests were done and was found out that the marginal adaptation of the zirconia ceramic inlays was statistically significant to feldspathic ceramic inlays. The internal adaptation of the ceramic inlays with flowable composite base in both the groups were statistically significant to the groups without the base.

Conclusion: It was concluded that, the ceramic inlays luted in the presence of a flowable composite base had better adaptation than the inlays luted directly to the tooth. Zirconia ceramic inlays (manufactured by CAD/CAM) with a flowable composite resin base had better marginal and internal adaptation than zirconia ceramic inlays without base and feldspathic ceramic inlays (manufactured by hot pressing) with and without a base.

Key words: CERAMIC INLAY, ZIRCONIA, FELDSPATHIC CERAMIC, FLOWABLE COMPOSITE.