

***The Influence of Recent Adhesive Onlay
Fabrication Techniques on the Fracture
Resistance of Endodontically Treated
Premolars
in Vitro Study.***

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ABSTRACT

One of the most common problems of endodontically treated tooth is low resistance to fracture against occlusal forces. The strengthening effect of bonded esthetic onlay restoration on weakened tooth has been reported. This study aimed to assess the fracture resistance of weakened human premolar restored with composite with and without cuspal coverage by using direct and indirect techniques. Indirect technique done by CAD/CAM system (computer aided design –computer aided manufacturer) and laboratory processing. Restorative material used in the direct and indirect (laboratory collaboration) techniques was a nanohybrid composite (Filtek Z250 XT) and for CAD/CAM technique was Paradigm MZ100 block. Forty human extracted maxillary premolars of approximately comparable sizes were divided into four groups:

Group (A): Ten endodontically treated teeth directly filled with Filtek Z250xt without cuspal coverage.

Group (B): Ten endodontically treated teeth prepared with onlay cavities and restored directly with Filtek Z250 XT.

Group(C): Ten endodontically treated teeth prepared with onlay cavities and restored indirectly with Filtek Z250 XT.

Group (D): Ten endodontically treated teeth prepared with onlay cavities and restored indirectly with Paradigm MZ100 blocks (CAD/CAM composite blocks).

Fracture strength of the experimental teeth was measured by using universal testing machine (an axial compression test). Data were analyzed statistically by one way ANOVA test and least significant difference test, the results showed that Group A has the lowest fracture resistance value than all experimental Groups and the difference are highly significant. While Group B has a high significant fracture

resistant value than the indirectly restored groups. Group C and Group D showed an approximate fracture resistant result (1.13KN and 1.07KN respectively) and the difference is statistically not significant. The mode of fracture for Group D was 90% restorable which is higher than group C (80%) restorable and group B (30%) restorable type of fracture.