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**FRACTURE RESISTANCE OF TEETH RESTORED
WITH DIFFERENT TECHIQUES**

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Removal of large amounts of dental tissue causes weakness of restored tooth. The type of composite and method of restoration can be factors affecting the fracture resistance of teeth under occlusal forces. The aim of study was to investigate the effect of application of new low-shrinkage composites on the fracture toughness of premolars with MOD cavities.

Literature search was carried out to research null hypotheses. 1- Fracture resistance in the group where the posterior methacrylate composite is used with the intermediate layer is the same as the group in which the intermediate layer is not used. 2- Fracture resistance in the group where low-shrinkage silorane base composite is used is the same as the groups in which methacrylate composite is used. 3- Fracture resistance in experimental groups is the same as sound and unrestored teeth.

In one study sixty healthy human maxillary premolars were extracted for orthodontic reasons and MOD standard Class II cavities were cut in 50 teeth. The samples were divided into 6 groups of 10 based on the restore method and the type of composite used: Group 1: Posterior methacrylate base composite (Filtek™ P60). Group 2: 0.5 mm glass ionomer interlayer (Fuji LC) + posterior methacrylate base composite (Filtek™ P60). Group 3: 0.5 mm intermediate layer of Flowable composite (Filtek™ Supreme XT) + posterior methacrylate base composite (Filtek™ P60). Group 4: posterior Low shrink silorane base composite (Filtek™ P90). Group 5: 10 teeth were extracted and without restoration as a positive control group. Group 6: 10 uncut teeth were left as a negative control group.

The samples were subjected to 1000 thermal cycles and then the fracture toughness test was performed with Instron device (at a speed of 1 mm / min).

In this study, the highest amount of fracture resistance was observed in healthy and intact teeth. Also the lowest failure resistance observed was related to the samples in which the cavities were cut without restoration due to the empty cavities. In this study, the force required to break samples restored with P60 composite was relatively similar to that of the P90 group, but less than that of the glass ionomer or flow composite liner.

Conclusion. Silorane composites have the same effect as methacrylate composites in increasing tooth strength. Application of liner with low elastic coefficient under posterior composites can increase tooth strength.