

*Restorative Materials and  
cavity preparation on the Young's  
Modulus of Elasticity for  
Premolars*

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## ABSTRACT

An ideal restorative material not only restores the decayed or defective tooth but also strengthens the tooth and provides an effective seal between the restoration and the tooth. Dentin – bonded resin composites have been shown to be effective in improving cuspal strength when used in conservative cavity preparation. Cuspal strengthening by bonded amalgam however, has been less predictable.

In this study using packable composite (3 M) and amalgam with two different cavity designs (CL I, CI II slot) is to determine the elastic modulus of the tooth before and after filling with these materials. Forty nine young premolars were used and divided into seven groups. These tested groups were as follows :

Group (A) : group of sound teeth .

Group (B) : group of empty CL I cavity .

Group (C) : group of CL I filled with composite .

Group (D) : group of CL I filled with amalgam .

Group (E) : group of empty CL II cavity .

Group (F) : group of CL II filled with composite .

Group (G) : group of CL II filled with amalgam .

A modified Lathe cutting machine was especially designed to open CLI cavities. The reason for disregarding hand manipulation for opening the cavity was to ensure maximum reproducibility of dimension and shape of the cavities for different teeth used in the study while, for opening CI II cavities is done by using a special circular cutting tool on milling machine was used.

After filling the teeth they were taken out from acrylic mold by hydraulic press, then sectioned by carbide disc and having specimen with (7) mm in length .The specimens were loaded by compression testing machine so as to calculate stress and strain then plot the stress – strain curve to find the elastic modulus for each individual specimen

Data obtained was statistically analyzed using ANOVA ,LSD tests and t – test. The results showed that specimen filled with packable composite were more elastic than those filled with amalgam ,although it was non – significant difference statistically which means that packable composite is relatively more supporting than amalgam .

As a conclusion , specimen was filled with packable composite had lower elastic modulus values than those filled with amalgam ,also teeth prepared with CL II slot showed a higher values of elastic modulus than those prepared with CL I cavity preparation .

It has been concluded that preservation of tooth structure during cavity preparation and type of restorative material are the goal for conservative treatment .