

**A Comparison And Evaluation of the effects of Different  
Compaction Techniques On Fill Density and Apical Seal of  
Gutta percha Root Canal Filling.  
(In vitro study)**

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## Abstract

This in vitro study was conducted to compare and evaluate the efficiency of three different obturation techniques; these were cold lateral compaction, ultrasonic compaction, and combination compaction techniques; on the fill density and apical seal gutta-percha.

For fill density thirty transparent acrylic blocks with artificial canals were used, these canals instrumented with step back technique; the acrylic blocks were weighed to the nearest 0.0001g using sensitive electronic balance, the samples were divided into three groups according to the obturation technique. The samples were obturated and then weighed again, the weight of the instrumented block was subtracted from the weight of the obturated block to give the weight of gutta-percha.

For apical seal of gutta-percha provided by the three obturation techniques; thirty human single canal roots were selected, instrumented with step back technique, then the roots were embedded in custom made acrylic socket, and the samples were divided into three groups according to the obturation technique used.

After storage period of 7 days; the samples were coated with sticky wax and immersed in 2% Methylene blue dye for 48 hours. Then the samples were split longitudinally for measurements of apical dye penetration with stereomicroscope.

The results of the study showed significant differences regarding fill density between both thermomechanical compaction techniques in which ultrasonic were used and the cold lateral compaction while no significant differences were found between combination compaction and ultrasonic compaction techniques.

No significant differences were found between different compaction techniques used in the study regarding dye leakage measurements.