

*The effect of delayed dowel space  
preparation  
on the apical seal of four obturation  
techniques  
(A comparative study)*

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**By**

***Ali Hassan Abdul-Ghani***  
***B.D.S.***

**Supervised by**

***Prof. Dr. Hussain Al-Huwaizi***  
***B.D.S., M.Sc., Ph.D.***

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## **Abstract**

This in vitro study was conducted to compare the effect of delayed mechanical dowel space preparation on the apical seal by dye penetration method in canals filled with lateral condensation, vertical compaction, Thermafil, and Softcore obturation techniques. Sixty simulated straight canals in clear resin blocks represented the samples used, being with the same length, size of apical preparation, and taper.

The samples were divided into four groups. Each group was obturated by different obturation techniques (lateral condensation, vertical compaction, Thermafil and Softcore) and Apexit root canal sealer. Samples were stored in normal saline at 37° C for one week. Delayed dowel space preparation was carried out on all the samples by Peeso reamers sizes 2 and 3 rotating at 5000 rpm in straight hand piece mounted on a modified surveyor, leaving 6 mm of gutta-percha apically. The coronal cavity was sealed and the samples were placed in 2% methylene blue dye for one week. The blocks were removed from the dye and washed. All the canals were examined for the apical dye penetration by stereomicroscope under 40X magnification and calibrated grid to establish the degree of apical leakage in millimeters.

The data collected were analyzed by analyses of variance ANOVA and least significant difference LSD tests to identify the presence of significant difference between groups. Results showed that vertical compaction leaked less significantly than lateral condensation and Softcore techniques, and that Thermafil was better than Softcore. No significant difference was found between

the gutta-percha coated carrier techniques and lateral condensation, Thermafil did not differ significantly from vertical compaction.