

***A Comparative Study to Evaluate the Effect of
Immediate versus Delayed Dowel Space Preparation
on the Apical Seal of Epiphany Obturation System
with Different Obturation Techniques
(An In Vitro Study)***

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Abstract

This in vitro study was conducted to compare the effect of immediate versus delayed dowel space preparation using rotary instruments (peeso reamers) on the apical seal of roots filled with epiphany obturation system using two different obturation techniques.

Forty freshly extracted human teeth with single and straight canals were used in this study. These teeth were cleaned and their crowns were removed at the cemento-enamel junction, the roots were instrumented using the step-back technique, instrumentation was accomplished by using the Gates-Glidden drills with copious irrigation of 2.5% sodium hypochlorite and 17% buffered solution of EDTA was used as the final rinse to remove smear layer.

All roots of all experimental groups were obturated with epiphany obturation system and the forty roots were randomly divided into 4 groups (10 teeth for each group):

Group A: Lateral condensation technique + immediate dowel space preparation.

Group B: Lateral condensation technique + delayed dowel space preparation.

Group C: Thermo-plastic Injection technique (Obtura II) + immediate dowel space preparation.

Group D: Thermo-plastic Injection technique (Obtura II) + delayed dowel space preparation.

The roots of groups A & C received dowel space preparation immediately after obturation using peeso reamers to a depth that left 5mm of the filling material apically while the roots of groups B & D received dowel space preparation after one week storage in 100% humidity condition at 37C° in an incubator.

The external surfaces of all roots were coated by two layers of sticky wax except for apical 2 mm and then were submerged in 2% methylene blue dye for 3 days at 37 C°. After that all roots were longitudinally sectioned for linear measurement of dye penetration through the apical forman using a stereomicroscope at X40 magnification with calibrated scale ocular grid.

The results showed significantly less apical leakage in roots obturated by thermo-plastic Injection technique than those obturated by lateral condensation technique for both immediate & delay dowel space preparation and highly significant less apical leakage in roots received immediate dowel space preparation than those received delayed one despite the type of obturation technique.