Evaluation of Adhesive Root Canal Filling Materials on Coronal Leakage

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Abstract: Aim; The purpose of this study was to evaluate the sealing ability of a newly introduced adhesive root canal sealer (MetaSEALTM, Parkell, USA) and other root canal filling materials.

Materials and methods; Thirty-two single-rooted human mandibular premolars were used. The crowns were removed and the root lengths were standardized to 12 mm. Four teeth were used as controls: two teeth were used as negative controls and the other two as positive controls. The remaining 28 teeth were randomly divided into 4 groups of 7 teeth each and filled with one of the following methods:

Group A: ResilonTM (Pentron, USA) + EpiphanyTM sealer (Pentron) using lateral condensation
Group B: Gutta-percha point (GC) + Sealapex sealer (SybronEndo, USA) using lateral condensation
Group C: Gutta-percha point + Superbond sealer (SunMedical) using single-cone technique
Group D: Gutta-percha point + MetaSEALTM using single-cone technique

After the canal sealers set, a polypropylene tube that contained 0.06% methylene blue dye solution was attached to the coronal portion of each root. Two millimeters of the apical portion was immersed in distilled water within a glass bottle. The amount of dye emerging through the root into the water was measured with a spectrophotometer at 1, 4, 8, 15 and 30 days after the immersion. Data obtained were statistically analyzed using ANOVA and Tukey-Kramer at the 5% significance level.

Results; There were significant differences among the groups and experimental time intervals (p<0.05; 2-way ANOVA). Statistical analysis revealed that the amount of leaked dye in the MetaSEALTM group on the 30th day was significantly less than that in the other three groups (p<0.05).

Conclusions; Under the conditions of this study, the sealing ability of MetaSEALTM was significantly better than that of the other three different types of sealers.

Key words: Coronal Leakage, Sealer, Methylene blue