

## Comparison of apical seal with or without the use of dentin adhesive system

Min-Jo Lee\*, Kyoung-Kyu Choi, Gi-Woon Choi

Department of Conservative Dentistry, College of Dentistry, Kyung Hee University, Korea

### I. Objectives

Effective endodontic obturation must provide a complete, three-dimensional filling of the root canal system, preventing the communication of fluids between root canal and surrounding periapical tissues. The objective of this study was to compare the apical leakage with or without the use of dentin adhesive system.

### II. Materials and Methods

Forty extracted human teeth with single canals were decoronated. Root canals were instrumented using GT rotary files and Profile .04 file up to #40, 1mm short of the apex. After each instrumentation, copious irrigation with 5.25% sodium hypochlorite solution and confirmation of apical patency were performed. Prepared teeth were treated with EDTA for 1 minute, and randomly divided into two groups. 20 teeth in Group 1 were obtured with the gutta-percha and AH-26 using the continuous wave of obturation technique. In Group 2, inner surfaces of the canals were treated with All Bond 2 primer and dried with paper point. An equal volume of All Bond 2 Dentin Enamel Bonding Resin and Pre-bond Resin were mixed and applied into the canal. Teeth were obturated with the gutta-percha and AH-26 using the continuous wave of obturation technique. After obturation, orifices were filled with IRM, and the teeth were stored in 100% humidity at room temperature for 2 days. Forty teeth were coated with two layers of nail varnish, except for the apical 3mm and immersed in 2% methylene blue solution for 84 hours. Then teeth were sectioned horizontally 1.5mm, 2.0mm, 2.5mm from the apex with a low-speed diamond saw. The sectioned surfaces were evaluated with the magnification of 40 using the stereomicroscope. Ratio of the dye-penetrated distance to the total dentinal distance were calculated.

### III. Results

Mean leakage ratio at each level	(n=40)		
	level 1(1.5mm)	level 2(2.0mm)	level 3(2.5mm)
Group 1	0.893 ± 0.242	0.758 ± 0.312	0.420 ± 0.315
Group 2	0.896 ± 0.199	0.312 ± 0.254	0.058 ± 0.119

\*Average ± Standard deviation

### IV. Conclusions

1. At level 1, the specimens with and without using dentin adhesive system showed similar sealing abilities ( $p > 0.05$ ).
2. At level 2 and 3, the specimens with dentin adhesive system demonstrated less microleakage than specimens without dentin adhesive system ( $p < 0.05$ ).