

Comparing sealer voids in root canals filled with calcium silicate-based sealer or AH Plus sealer using single-cone technique

Nicolas Pace, B.S.; David Jaramillo, D.D.S.

Department of Endodontics, University of Texas Health Science Center at Houston School of Dentistry

Objective: Sealers are used during root canal therapy to seal off the compromised root canal from the oral environment. This aids in preventing bacterial leakage and treatment failure. Many types of materials are used to accomplish root sealing. The purpose of the current study was to compare the sealing efficacy of calcium silicate-based sealer and AH Plus sealer using the single-cone technique.

Experimental Methods: Extracted teeth with one root and canal were standardized to 17mm in length from the apex. Canal access was established as needed then hand and rotary files were used to clean and shape the canals. NaOCl was used as an irrigant throughout the instrumentation sequence and EDTA was used afterwards to remove the smear layer. Single-cone technique was then performed using gutta percha cones to obturate 26 teeth using AH Plus sealer and 27 teeth using calcium silicate-based sealer. After incubating for at least 7 days at 37°C, the teeth were sectioned horizontally at three distances from the apex with a diamond disc to create an apical, middle, and coronal portion. One surface on each sectioned third was sanded then EDTA was used to remove the smear layer. Each smoothed surface was then visualized under a stereomicroscope and the surface area of any voids in the sealer were measured. The void surface areas were then compared between each sectioned third and each sealer type using R statistical software and a Poisson distribution.

Results: Statistical analysis revealed no significant difference in sealer void surface area between apical, middle, and coronal portions of the root and no difference between the sealers used.

Conclusion: Given an undergraduate level of experience in endodontics and using the single-cone technique, AH Plus and calcium silicate-based sealers perform equally well in terms of how many voids they contain after obturation.

This study was supported by the UTSD Summer Research Program