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Evaluation of the apical microleakage of two root canal sealers by using 3-D reconstruction

The purpose of this study was to compare in vitro through the 3-D reconstruction the apical microleakage of two root canal sealers; Ketac-Endo and Roth's 801. Fourteen human single-rooted mandibular teeth were used for this work. The canals were prepared with hand instruments using a step-back technique. Followingly the teeth were divided into two groups. In the first group Ketac-Endo was used while in the second group, Roth's 801, in combination with gutta-percha points using lateral condensation technique. Two days after the crowns were removed, the roots were coated with three layers of nail polish except for the 3 mm apically, and were put 5 days in India ink for passive stain. Serial cross sections were taken from each specimen 0.75 mm thick, by using a special microtome (Isomet, Buehler, U.S.A.). Each section was photographed under a stereoscopic microscope (Stemy SV8, Zeiss, Germany), each photograph was digitized and proceeded in order to obtain the 3-D reconstruction of the external surface of the teeth, their corresponding prepared root canals and their apical microleakage. Apical microleakage was observed in both groups (each tooth of the first group and two of the second one) ranging between 1,5-8,25 mm in the root canal system. It was clearly seen that a lateral root canal existed, in those teeth the apical microleakage reached 8,25 mm height.The 3-D reconstruction method is a useful method for the evaluation of the apical microleakage using different root canal sealers.