

AIM

The aim of this study was to compare the efficiency of four different retreatment instrumentation techniques to remove the filling material (GP and sealer) from the root canal walls, during retreatment procedure and also to evaluate the percentage of remaining filling materials on root canal walls using Stereomicroscope.

MATERIALS AND METHODS

A total of 100 extracted maxillary anteriors were selected. Teeth with fully formed apices, absence of calcifications and straight root canal were collected and stored in saline with 0.1% thymol. The teeth were washed under running water and decoronated with diamond disc to standardize root length of 16mm.

Access cavities were prepared and size-15 K-file was introduced into the canal until it was visible at the apical foramen and the working length established 1 mm short of this length. The crowns were removed at the CEJ using a diamond-coated high-speed bur with air-water spray coolants. The roots were ground coronally to establish a uniform 16-mm working length for all teeth. Instrumentation of all root canals were performed by a single operator. The coronal thirds of all root canals were enlarged with size 1, 2 and 3 Gates-Glidden drills . The apical two-thirds were enlarged to working length using K-files upto size 50 with a balanced-force technique (Roane et al. 1985). At each instrument change, 2 ml of 2.5% NaOCl was used for irrigation. The root canals were dried with paper points and filled using laterally compacted gutta-percha, spreaders and zinc oxide eugenol. After completion of the procedure, a heated plugger was used to remove the excess gutta-percha to a level 2 mm short of the canal orifice followed by vertical compaction with a cold plugger.

The coronal orifice of each canal was sealed with a temporary filling material , and the teeth were stored at 37⁰C in 100% humidity for 1 week to allow complete setting of the sealer. Teeth were radiographed in B-L and M-D directions to confirm the radiographic adequacy of root filling, using the following criteria: reaching working length, uniform radiopacity and no voids.

The temporary fillings were removed, and a 5-mm coronal portion of each root canal filling was removed using number 2 and 3 Gates-Glidden drills. All specimens were then coded and randomly assigned to four groups of 25 specimens each. Group A- H-file, Group B- Protaper universal retreatment file, Group C- D-Race, Group D- R-Endo file. Retreatment procedures were done with respective files.

The teeth were then sectioned into two halves longitudinally and each half into coronal, middle and apical thirds. Stereomicroscope image analysis carried out in the coronal, middle and apical 3rd samples of all the four groups. A 4-point grading system was used with respect to residual obturation material and debris at the coronal, middle and apical third of each canal.

RESULTS

When comparing all the four groups, maximum reduction in the mean value is seen in Group C (D race) in coronal, middle and apical third. When comparing between the groups, Group C and Group D shows statistically significant difference in coronal and middle portion of the tooth.

CONCLUSION

With in the limitations of this in vitro study it can be concluded that:

1. The percentage of remaining filling material in the root canal wall following retreatment was minimum in D-race file succeeded by H- file, Protaper universal retreatment file and R-endo file being the maximum.
2. The percentage of remaining filling material after retreatment found to be minimum in coronal area succeeded by middle and apical area.

KEYWORDS

Endodontic retreatment, stereo microscope, H file, Protaper universal retreatment file, D-race, R-endo.