

## **ABSTRACT**

### **AIM**

Aim of this in vitro study was to conduct a morphometric analysis on the buccal furcation groove in extracted bifurcated maxillary first premolars (BMFPs) and to correlate anatomical measurements using CBCT before and after cleaning and shaping using three file systems - stainless steel K files, NeoEndo files and Wave One file.

### **MATERIALS AND METHODS**

99 extracted human bifurcated maxillary first premolars were selected. Preliminary CBCT scan was done and pre-instrumentation dentine cementum wall thickness was measured at the mid groove area. Access cavity preparation was done using Endo access bur in all the samples. The teeth were then randomly divided into three groups (n = 33). Group I was instrumented with Stainless steel (SS) K-file up to apical 25 size, 2% taper. Group II with Neoendo flex file (NF) up to apical 25 size, 4% taper. Group III with WaveOne (WO) primary file 25 size, 8% taper. Working length was verified using a radiograph. Canals glide path was established using size #15k file. Canal irrigation was achieved with 5.25% sodium hypochlorite during instrumentation and delivered into the canal by a 5 ml syringe with a 27 gauge side vented needle. After completing the instrumentation, the samples were subjected to post operative CBCT scan. Dentine cementum wall thickness at same point was measured and noted. The values were subjected to statistical analysis - one way ANOVA, Post Hoc HSD test and paired sample T test.

## **RESULTS**

Post instrumentation measurements showed Group III removed more dentine than the other two groups. The mean post instrumentation thickness of the dentine cementum wall at mid-groove area is 0.73 mm for Group I, 0.74 mm for group II and 0.61 mm in group III. Statistically there was significant difference in mean thickness of the group I (0.73 mm) and group II (0.74 mm) when compared with group III (0.61 mm). Pair wise comparison between each groups showed no significant difference between group I and group II. Whereas when group I is compared with group III it showed statistically significant at level five and comparison of group II and group III showed statistical significant at level one.

## **CONCLUSION**

WaveOne file removed greatest amount of dentine where as Neoendo files removed a more predictable and consistent thickness of dentin along the length of buccal root of BMFP. All the instrumented canals showed remaining dentine cementum wall thickness less than 1 mm but above 0.5 mm at mid groove area which is considered as critical.

**Key words: Furcal Groove, CBCT, Bifurcated Maxillary first premolar.**