

Root canal morphology of maxillary first premolar

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Introduction: Endodontic failures on premolars are statistically important mainly due to missed canals as a result of insufficient knowledge of the typical anatomical diversity shown by premolars. This study was carried out to examine the degree of variations seen in the maxillary first premolar using the clearing and decalcification method to obtain a three-dimensional view of the root canal system.

Objectives:

- To assess the frequency of number of roots and type of canals in extracted maxillary first premolar using Vertucci's classification.
- To measure the dimensions of maxillary first premolar teeth (length of tooth, crown height and circumference at cervix in millimetres).

Materials and Methods: It was an *In-vitro*, cross-sectional, descriptive study conducted at the Dental Clinics at Aga Khan University Hospital, Karachi from August 2010 – December 2012 on 91 maxillary first premolars using non probability, convenience sampling technique.

Methodology: All attached soft tissue and calculus was removed and access cavities were prepared. The teeth were decalcified and rendered transparent using the technique reported by Robertson et al to obtain a 3D view of the root canal system.

SPSS version 19 was used for data analysis. Mean and frequencies of variables such as number of roots, canal morphologies, and length of the teeth, crown height and circumference at cervix were determined.

Results: There were 32.6% of the teeth with 1 root, 64.4% had two roots and 3.0% had three roots.

Type I canal morphology was seen in 72% of the maxillary first premolars. 5.3% of the teeth exhibited type IV and 4.5% exhibited type VI morphologies, and the rest of the teeth were between Types II, III, V and VII Vertucci's classes, whereas 5.3% of the teeth showed variations in canal patterns which did not fall into Vertucci's classes.

The mean length of maxillary first premolars was 19.02 ± 1.6 mm whereas mean crown height was 8.25 ± 0.95 mm. The mean circumference at cervix of the tooth was 20.88 ± 2.2 mm.

Conclusion: The mean length of maxillary first premolar seen in our study was 19.02 mm.

There were 64% of maxillary first premolars were two-rooted.

The most prevalent canal morphology observed was Vertucci's Type I with a single canal extending from the chamber to the apex.

Keywords: Canal morphology, Root canal, Vertucci's classification.

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