

## **VARIATION IN THE ROOT FORM AND ROOT CANAL MORPHOLOGY OF PERMANENT MANDIBULAR FIRST MOLARS**

**U.S. Malwatte<sup>1\*</sup>, H.R.D. Peiris<sup>2</sup>, J.B. Abayakoon<sup>3</sup> and K.A. Wettasinghe<sup>1</sup>**

<sup>1</sup>*Department of Restorative Dentistry, Faculty of Dental Sciences, University of Peradeniya, Sri Lanka*

<sup>2</sup>*Department of Basic Sciences, Faculty of Dental Sciences, University of Peradeniya, Sri Lanka*

<sup>3</sup>*Royal Oman Air Force, Masirah Air Base, Muscat, Sultanate of Oman*  
*\*uthpalasm@gmail.com*

Permanent mandibular first molars (PMFM) commonly have two roots; mesial and distal. Mesial root usually has two canals while the distal has one. Occasionally, this tooth can have three roots. Thorough knowledge of variations in the root and canal morphology helps in correct location, identification and negotiation of them allowing for proper execution of the treatment.

A sample of 457 extracted PMFM was collected from patients within the age range of 30-70 years. Teeth were washed immediately and stored in either water or normal saline. They were boiled in 5% NaOH for five minutes and cleaned with 10% NaOCl. The number of roots was recorded using Turner's classification and lengths of the mesial and distal roots were measured using a digital vernier calliper to the nearest 0.01mm. A vacuum injection protocol was used to inject China ink into the root canal system and make the teeth transparent. Specimens were examined under a dissecting microscope at x10 magnification. Vertucci's classification of root canal morphology was used to classify the root canal morphology. In the present sample, 95.8% of the teeth had two roots while 4.2% had three. Mean mesial and distal root lengths were 14.1 mm and 12.9 mm, respectively. Commonest root canal type of the mesial root was type IV and distal root was type I. Lateral canals were most prevalent at apical 1/3 of both roots. Inter-canal communications were most common at apical 1/3 of the mesial root and middle 1/3 of the distal root. When root canals are bifurcated, level of bifurcation in both the mesial and distal root was most prevalent at the cervical 1/3. When they converged, the level was most prevalent at the apical 1/3 of both the roots. The prevalence of furcation and middle mesial canals were 1.5% and 0.2%, respectively in the present sample.

In conclusion, prevalence of three rooted mandibular first molars is less than 5% in the present sample. Mesial root shows the most variable canal morphology with the root canals commonly bifurcating and converging at the cervical and apical 1/3 levels of the root, respectively.