

### I . Objectives

To investigate the canal system in the mesiobuccal root of the maxillary first molar collected from indigenous Korean population.

### II . Material and Methods

Sixty one maxillary first molars from indigenous Korean population were randomly selected. The age and sex of the patients were unknown. Each tooth was embedded separately in epoxy resin. Serial transverse sections were made perpendicular to the long axis of the mesiobuccal root, with a low-speed diamond saw (IsoMet Buehler, USA) at 1 mm increments from the root apex to the pulpal floor. Each section was placed in 3% sodium hypochlorite for 24 hours to remove any organic material remaining in the root canal. Each section was rinsed in water and dried. The resected surface was stained with 2% methylene blue dye and examined with stereomicroscope (Olympus, Japan) at 20 and 40 magnification.

The following observations were made: (1) canal configuration using Weine's classification; (2) level of convergence of type II canal; (3) level of divergence of type IV canal; (4) number of canals at each level; (5) incidence of an isthmus at each level in sections with two canals.

### III . Results

1. Canal configuration analysis showed that 36.1% of the specimen classified as type I, 16.4% as type II, 37.7% as type III, and 9.8% as type IV.
2. Type II canal was merged in one canal within 1 to 4 mm of the apex. 40% of type II canal converged at 2 mm of the apex.
3. Type IV canal was divided into two canal within 2 to 4 mm of the apex. 66.6% of type IV canal branched off at 2 mm of the apex.
4. None of the sections had more than two main root canal.
5. 48.4% of the sections in 3 mm with two canals contained an isthmus, and more than 70% with two canals has isthmus at 4 to 5 mm sections.

### IV . Conclusions

This study revealed that 63.9% of the mesiobuccal root of maxillary first molar had two canal, and 76.5% of sections with two canals in 5 mm had an isthmus. Because of this complexity the clinician should always search for extra canal carefully, and root canal system, including an isthmus, should be cleaned and shaped completely, and obturated three dimensionally for successful endodontic treatment.