

A paradigm evolution shift in the endodontic map

A “paradigm evolution shift” could refer to current advances in diagnostic technology in endodontics. The last decade has shown numerous reports on the identification of external and internal anatomical radicular variations in the human dentition. Apparently, a “reconsideration” of our endodontic map for root and root canal morphology is appropriate.^[1]

Many decades ago, the occurrence of three-rooted mandibular molars has been reported in some populations groups. However, with the aid of advanced diagnostic modalities such as cone beam computed tomography (CBCT), this anatomical variation is currently becoming a common normal morphologic variant in Asian traits, with prevalence reaching >30%.^[2,3]

Current literature reports similar observations in the occasion of middle mesial (MM) canals in mandibular molars. For many years, the prevalence of MM root canals in mandibular molars has been reported as a rare or a not uncommon variant ranging from <1% to 19%.^[4] However, in 2015, the prevalence of MM canals in clinical settings is higher than previously reported^[5,6] and reaches up to 46.2%.^[5] Clearly, the application of operating microscopy together with an “appropriate troughing approach” has a valid impact on locating negotiable MM canal orifices.

In recent years, micro-computed tomography (micro-CT) has gained increasing significance in the study of root canal morphology in endodontics. Micro-CT studies continue to demonstrate high levels of complexity of the root canal system, and many root canal configurations, encased in roots such as mesiobuccal roots of maxillary molars, distal roots of mandibular molars and single-rooted mandibular anteriors are described as “nonclassifiable.”^[7-9]

Now, the following questions need to be addressed. Does the future hold a shift in the prevalence of additional root canal types in the human dentition?. Can advanced experimental diagnostic techniques together with current advances in endodontic armamentarium applied in our clinics (including CBCT, operating microscopy, and thorough exploration) change our perspectives toward “new,” “rare,” “not uncommon” and “common” anatomical variations in different populations?. These questions cannot be answered without an intimate collaboration between researchers and clinicians.^[1,10]

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