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CBCT identifies uncommon root canal variation

Prashant P. Jaju and Sushma P. Jaju

Introduction

CBCT has brought a paradigm shift to dental imaging, unraveling the unsolved mysteries of dentistry from a two-dimensional perspective to a threedimensional perspective. Hybrid CBCT machines such as the Orthophos SL (Dentsply Sirona, Germany) offer better resolution which helps to evaluate changes in cortical and cancellous bone at the sub millimeter level. The following case demonstrates how CBCT enabled the identification and subsequent navigation of complex root canal anatomy.

Case Report

A 27-year-old female patient was referred to our dental diagnostic center for evaluation of the maxil-lary right first molar because the general dentist suspected variation in root canal anatomy. A 5 x 5.5 cm CBCT scan was performed. On evaluation of the scan, three major orifices were present, mesiobuccal, distobuccal and palatal. The mesio- buccal canal below the furcation region showed two canals – mesio-buccal 1 and 2.

Approximately 2.5 mm below the pulpal floor, a third canal emerged (MB3) from the main mesiobuccal canal (MB1) (Fig. 1–3). At approxi-mately 4 mm distance below the pulpal floor, 2 and 3 merged again with each other to exit through a single foramen and the main me- siobuccal canal exited through another foramen. Oval shaped periapical radiolucency was pres-ent with all three roots. Thinning and perforation of the palatal and buccal cortical plates on the sinus floor were observed.

Opening and modifying the shape of the access cavity to approach all orifices is a key to success in identifying and negotiating unu-sual anatomy of root canals. CBCT is a valuable tool for the initial identification and effective evalua-tion of the internal morphology of teeth. Mesiobuccal 2 canal is one of the most common root canal anatomy variations with respect to maxillary molars. Mesio-buccal 3 canal is quite rare with an incidence of 1.1 percent. Minute assessment of this complex root canal anatomy was possible due to the high resolution offered by Ortho phos SL. The diagnosis and information were then passed on to the patient's dentist.
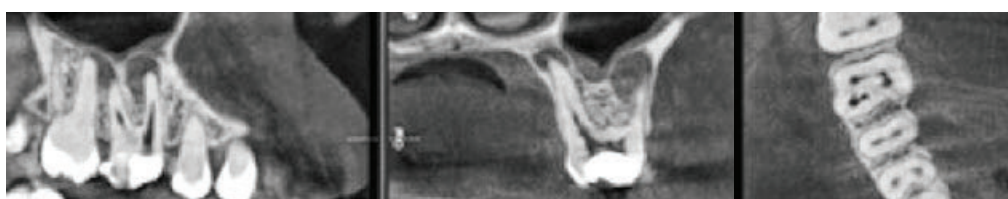

Figure 1: Images taken at coronal third level of roots. Orthophos SL axial image shows four major orifices, with two mesiobuccal canals. Periapical lesion is pres-ent with both buccal roots.
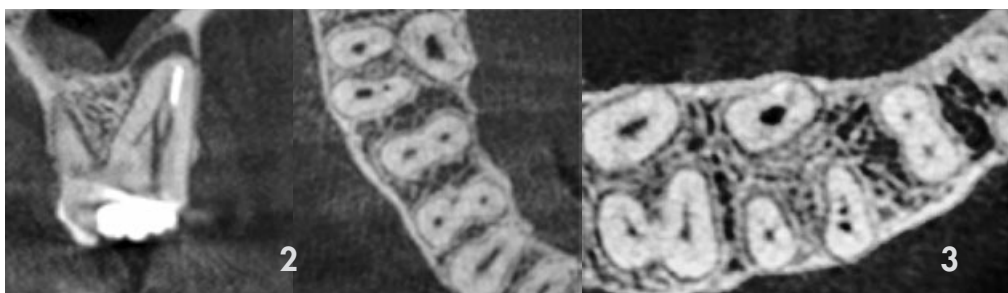

Figure 2: Orthophos SL cross-sectional and axial image view show separation of mesiobuccal 1 canal into mesiobuccal 3 canal in middle third level of root.

Figure 3: Orthophos SL axial images show all three canals in the mesiobuccal root at apical third level.