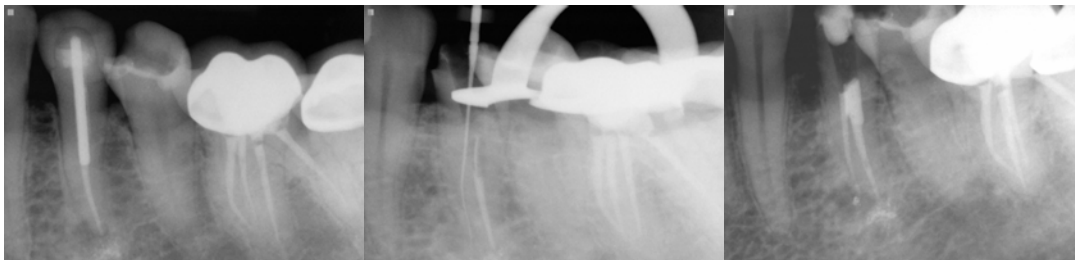


Root Canal Morphology of the Mandibular First Premolar

The success of nonsurgical root canal therapy is dependent on a thorough knowledge of external and internal root canal morphology in order to locate all canals and properly clean, shape, and obturate the spaces in three dimensions. Mandibular first premolars frequently present radiographically as conical – single rooted teeth, especially when observed from the standard radiographic bucco-lingual view (first image below). Furthermore, the textbook description is typically that of a single rooted tooth. The reality is, mandibular first premolars can have the most challenging internal anatomy of all teeth.

RETREATMENT OF TOOTH #21 ILLUSTRATING COMPLEX ANATOMY



A single apical foramen may be found in mandibular first premolars in 4 of 5 cases, but two or more foramina may occur over 20% of the time. Tactile sense with a fine curved stainless steel file in a skilled operator’s hand is often the best guide to the detection of accessory canal systems. However, use of the surgical operating microscope is best used for direct visualization of canal systems branching off the main canal or dividing in the mid-radicular area. (middle image). Obturation with surgical operating microscope magnification (right image) shows the completed retreatment. The deep-bifid root space division was anticipated and visualized for complete debridement. Additionally, a post was not required for restoration since there was more than adequate coronal tooth structure for core retention and ferrule effect.



The figure on the left shows the distal proximal view of a similar tooth. When the tooth is viewed radiographically from the buccal, the bifid apical area cannot be appreciated. Also, an instrument placed into the access will likely only enter the buccal canal. Without proper visualization and tactile exploration, the lingual space would not be instrumented.

The root and root canal morphology of the human mandibular first premolar: A literature review. Cleghorn BM, Christie WH, Dong CCS. JEndodon 2007;33:509-516.