Mandibular Canines with Two Roots and Two Canals - A Case Report
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Abstract
Mandibular canines are single rooted tooth with one root canal in general. Various literature reports that approximately 15% may have two canals or sometimes two roots. This paper reports a clinical case of mandibular canine with two roots and two canals.

Key Words: Mandibular Canine; Two Root; Two root canal

Introduction
Anomalous root and root canal morphology can be found associated with any tooth with varying degree and incidence.(1-4) Knowledge of the root canal anatomy is the basic pre requisite for successful completion and outcome of endodontic treatment.(5) Numerous studies done by various others revealed a wide variation in the number of roots and canal pattern in mandibular canines. The occurrence of two roots and even more two root canals is rare, ranging from 1% to 5%. (6, 7) This paper reports the case of a patient with mandibular canines with two roots and two root canals.

Case Report
An 18 year old female patient was referred to our outpatient clinic for endodontic treatment of the mandibular anteriors before prosthetic rehabilitation. Intraoral examination revealed dental caries with pulp exposure in relation to 43. Periapical radiograph showed the presence of two roots in right mandibular canine (Figure 1).

Endodontic treatment was started, after administering local anesthesia. Rubber dam was placed and endodontic access was performed with a #1014 round diamond bur and an Endo Z tapered safe-end bur. On attempt to negotiate the canal we found file going in different direction on every attempt, which gave a suspicion of presence of two canals. Hence size No. 10 and No. 8 K-file were placed in canal and radiograph was taken at two different angulations to confirm the presence of extra canals (Figure 2). Radiograph revealed the presence of two canals and two roots. Then the case was attempted under microscope to confirm the presence of two canals. On viewing under microscope at 3 X and 5X we found the presence of two canals one buccal and one lingual and furcation was found to be at middle thirds (Figure 3).

The cervical and middle thirds were prepared with a hand file with master apical filling up to No. 30. Root canal length was determined radiographically and confirmed with an electronic apex locator. Chemo-mechanical preparation was performed with hand files and irrigation with 5.25% sodium hypochlorite and 17% EDTA at each change of file. The instrumented root canals were filled with gutta-percha cones and an epoxy resin-based root canal sealer. The final radiographs showed two well-obturated canals ending at the electronically located apexes (figure 4).

Discussion
Diagnosis and identification of the total number of roots and root canals present in a tooth preoperatively were the key factors for endodontic treatment success. The initial radiograph is extremely important because it allows for the identification multiple roots, root canals and anatomical variations.

Figure 1. Preoperative radiograph of 43, Figure 2. Access under microscope 5X magnification, Figure 3. working length files have been with two roots placed in the two canals, Figure 4. Final obturation of the root canals with gutta percha.
Radiographs in different angulations reveal the anatomy of roots and root canal. Hence, it’s mandatory to take additional radiographs. Bifurcations in the cervical and middle thirds may be observed radiographically when the x-ray incidence angle does not cause superimposition of images. In mandibular canines, bifurcation at these sites has been shown to occur in 43.1% of the situations. In the present case, identification of the second root was evident. However, it does not always occur. Identification of the second root is even more difficult in the presence of tooth crowding. Therefore, the radiographic image should be carefully analyzed in order to interpret and identify details that may suggest the presence of bifurcations or trifurcations, such as sudden root canal discontinuity.

Presence of single root with two canals in mandibular canines was observed by many authors. However, the presence of two roots in mandibular canines is rarely observed. Quellet described the occurrence of two roots and two canals in mandibular canines in only 5% of all analyzed teeth. Laurichesse et al. described the second root of mandibular canines in only 1% of cases. A previous study that investigated the internal anatomy, direction and number of roots and size of 830 extracted human mandibular canines found only 1.7% of the teeth with two roots and separate two canals. D’Arcangelo et al. reported two cases of endodontic treatment of mandibular canines with two roots. A case report of two roots in mandibular canine was also presented by Heling et al. Yet the tooth exhibited three root canals.

Conclusions
Clinicians should be aware of anatomical variations in the teeth they are managing, and should never assume that canal systems are simple. Even though the most common anatomy of mandibular canines comprises a single root and a single root canal, clinicians should consider the possible variations and always search for the second root canal in teeth with either one or two roots.

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