

# ENDODONTIC MANAGEMENT OF MANDIBULAR CANINE WITH TWO ROOTS AND TWO ROOT CANALS: TWO CASE REPORTS

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## ABSTRACT:

The success of endodontic treatment depends on dentist's knowledge about root canal morphology and its possible anatomic variations. Various literature reports indicate majority of mandibular canines have one root and one root canal, but 15% may have two canals, and a smaller number of 1.7% may have two distinct roots.

This paper reports two cases of mandibular canines with two roots and two root canals.

**Key words:** Two rooted mandibular canine, Aberrant root canal anatomy, Two root canal

## INTRODUCTION:

The successful outcome endodontic treatment depends on the thorough knowledge about root canal morphology and its possible anatomic variations. The anatomy of the root canal system determines the parameters under which the endodontic treatment will be accomplished and directly affects the success of the root canal treatment. Many investigators have reported the anatomical variations associated with mandibular canines. In most cases, the mandibular canines present only one root (1-3). The occurrence of two roots and even more two root canals is rare, ranging from 1% (2) to 5% (3). Mandibular canines are recognized as usually having one root and

one root canal in most cases, although approximately 15% may have two canals or sometimes two roots (4). An in Vitro study of permanent human mandibular canines show variation in canal configuration as Type I -70%, Type I I-4-12%, Type III-4-6%, Type I V-4-10%, Type V-2%, straight canals in 53.84-60.71%, curved canals in 46-39%, apical foramen located centrally in 34.61-57.14%, & apical foramen located laterally in 65.38-42.85% of cases (5).

This paper reports two cases of patients with mandibular canines with two roots and two root canals.

## CASE DETAILS:

### CASE 1

A 50-year-old male presented with severe pain in the left mandible. Clinical examination revealed that tooth 33 had deep cervical caries, and a thermal test with ethyl chloride, and percussion test produced severe, long-lasting pain. A diagnosis of irreversible pulpitis was established. A diagnostic radiograph did not demonstrate periapical pathology but did indicate two roots (Fig. 4). Rubber dam (Hygenic Dental Dam, Colte'ne Whaledent, Langenau, Germany) was placed and an endodontic access cavity was prepared using a round Endo access bur (No.2) and an Endo Z tapered safe-end bur (Dentsply Maillefer, Ballaigues, Switzerland). The pulp chamber was opened extensively to facilitate the location of the buccal and lingual canals. Root canal length was determined radiographically and confirmed with an electronic apex locator (Root ZX; J Morita Co, Kyoto, Japan). Both canals were instrumented with a size 10 and 15 K-file (Dentsply Maillefer, Ballaigues, Switzerland) to obtain a manual glide path. Coronal flaring of the root canals was carried out using X1 and SX ProTaper next rotary instruments (Dentsply Maillefer, Ballaigues, Switzerland) with X-Smart endodontic motor (Dentsply Maillefer, Ballaigues, Switzerland). Instrumentation was completed using series of ProTaper (Dentsply Maillefer, Ballaigues, Switzerland) nickel titanium (NiTi) rotary instruments with X-Smart endodontic motor with master cone

selected as finishing file F2 and was radiographically checked to the correct working length. During instrumentation, the root canals were flushed with copious amounts of 3% sodium hypochlorite (NaOCl). After root canal preparation, a final irrigation was performed alternating 17% ethylenediaminetetraacetic acid (EDTA) and 5.2% NaOCl solution for the effective removal of the smear layer. The root canals were then washed with sterile saline and dried with sterile paper points. Both the canals were then obturated with protaper Gutta-percha points (No. F2) and AH plus sealer. The final radiographs showed two well obturated canals ending at the radiographic apex. The access cavity was filled with composite restoration to avoid leakage.

### CASE 2:

An 23 year old female patient was referred to our outpatient clinic for endodontic treatment of the mandibular canine. Intraoral examination revealed dental caries with pulp exposure in relation to 33. Periapical radiograph showed the presence of two roots in left mandibular canine (Figure 1). Endodontic treatment was started, after administering local anesthesia and under Rubber dam isolation endodontic access was performed with a #1014 round diamond bur (KG Sorensen, São Paulo, SP, Brazil) and an Endo Z tapered safe-end bur (Dentsply, Maillefer, Ballaigues, Switzerland). Location and negotiation of root canals were done with a size 10 K-file (Maillefer, Ballaigues, Switzerland). The cervical and middle thirds were prepared

with a SX file of the ProTaper® system (Dentsply/Maillefer). Root canal length was determined radiographically and confirmed with an electronic apex locator (Root ZX; J Morita Co, Kyoto, Japan). Chemomechanical preparation was performed with ProTaper next® system (Dentsply/Maillefer) and irrigation with 5.25% sodium hypochlorite at each change of file. The instrumented root canals were filled with gutta-percha cones (size F2) and AH plus sealer.

## DISCUSSION:

The complex nature of root canal morphology of canines should be thoroughly understood. 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. In mandibular canines, bifurcation at these sites has been shown to occur in 43.1% of the situations.<sup>(6,7)</sup>

Presence of single root with two canals in mandibular canines was observed by many authors <sup>(6-8)</sup>. However, the presence of two roots in mandibular canines is rarely observed. Quillet described the occurrence of two roots and two canals in mandibular canines in only 5% of all analyzed teeth <sup>(3)</sup>. Laurichesse *et al.* described the second root of mandibular canines in only 1% of cases <sup>(2)</sup>. 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 <sup>(9)</sup>.

Endodontists should always search for two canals in mandibular canines during endodontic treatment, even in single-rooted teeth. Manual exploration of root canal system with an endodontic file or explorer is a reliable way to identify the exact configuration of root canal, especially the number of foramina. Care should be taken at access opening because exploration and location of canal orifices helps to navigate the canal. Practice of extension of access cavity bucco-lingually, is mandatory to find extra and hidden canals. Efforts should be made to locate the point where the root or the canals divide. The more apically a root canal divides, the more difficult is the case <sup>(2)</sup>. In the present cases, identification of the second root was evident. In case 1, root canals were divided immediately below the pulp chamber, so, it became easy to carry out further treatment. In case 2 the roots bifurcated near the middle third of the length which made it a more difficult case to treat.

## CONCLUSION:

Successful and predictable endodontic treatment requires knowledge of biology, physiology and root canal anatomy. 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. It also requires proper instruments and the knowledge of use these instruments effectively.. This report

highlights the importance of having detailed knowledge of all possible root and root canal aberrations.

#### REFERENCES:

1. Pineda F, Kuttler Y. Mesiodistal and buccolingual. Roentgenographic investigation of 7275 root canals. *Oral Surg, Oral Med and Oral Pathol* 1972;33:101-110.
2. Laurichesse JM, Maestroni J, Breillat J. *Endodontie Clinique*. 1<sup>st</sup> ed. Paris, France: CdP;1986:64-66.
3. Ouellet R. Mandibular permanent cuspids with two roots. *J Can Dent Assoc* 1995;61:159-61.
4. D'Arcangelo C, Varvara G, De Fazio P. Root canal treatment in mandibular canines with two roots: a report of two cases. *International Endodontic Journal* 2001;34(4):331-4.
5. Sikri V, Kumar V. Permanent Human Canines: Configuration And Deviations Of Root Canals: An In-Vitro Study. *Journal of Conservative Dentistry* 2003;6(4):151-2.
6. Victorino FR, Bernardes RA, Baldi JV, Moraes IG, Bernardinelli N, Garcia RB, et al. Bilateral mandibular canines with two roots and two separate canals: case report. *Brazilian Dental Journal*. 2009;20(1):84-6.
7. Shanna R, Pécora JD, Lumley P, Walmsley A. The external and internal anatomy of human mandibular canine teeth with two roots. *Dental Traumatology*. 1998;14(2):88-92.
8. Green D. Morphology of the pulp cavity of the permanent teeth. *Oral surgery, oral medicine, and oral pathology*. 1955;8(7):743-59.
9. Pécora JD, Sousa Neto M, Saquy PC. Internal anatomy, direction and number of roots and size of human mandibular canines. *Braz dent J*. 1993;4(1):53-7.