

Endodontic Management of Mandibular Canine with Two Roots and Two Root Canals: A Case Report

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Abstract

Endodontic treatment may sometimes fail because morphological features of the tooth adversely affect the treatment procedures. Many investigators have reported the anatomical variations associated with mandibular canines. The majority of mandibular canines have one root and root canal, but 15% may have two canals, and a smaller number may have two distinct roots. The present case describes clinical case of mandibular canine with two roots and two canals.

Keywords: Canal configuration, endodontics, mandibular canine, two roots, and two canals.

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INTRODUCTION

The aim of endodontic treatment is the elimination of infection from the root canal and the prevention of re-infection [1]. However, root canal treatment may fail because of factors including persistent infection of the root canal, unsatisfactory intra-canal procedures that may lead to poor canal preparation, broken instruments and incomplete root canal fillings. Morphological features of the tooth may also adversely affect endodontic procedures [2]. Many clinicians have the perception that Lower canine teeth usually have a single root with one root canal, the exception being two canals in 4.5-22% of cases [3-8]. The following clinical report describes endodontic treatment of mandibular canine with two roots and two canals.

CASE REPORT

A 28-year-old female reported with severe pain in the left mandible front region. The intra-oral examination revealed that tooth # 33 had a deep carious lesion with exposed pulp. The tooth was tender on percussion. Pulp testing with an electric pulp tester (Parkell Inc. Edgewood, NY, USA) and thermal test using hot gutta-percha elicited non-responsiveness from the suspect tooth. The diagnostic radiograph showed a caries lesion approaching pulp in relation to the tooth # 33 and the presence of two roots (Fig-1A). Thus, the diagnosis of acute irreversible pulpitis was made. Following local anaesthesia, an endodontic access opening was made using an Endo-Access bur (DENTSPLY Maillefer, Switzerland), under isolation

with Rubber Dam and the pulp chamber was exposed clearly. Conventional access was prepared and patency was checked using a size10 K-file (Sybron Endo, Glendora, CA, USA). The working length was determined using electronic apex locator Root ZX (J. Morita, Kyoto, Japan). The electronically determined working length was confirmed radiographically using a size 15 K-file (Sybron Endo) (Fig-1B). The root canal was cleaned and shaped by rotary nickel-titanium Pro-Taper instruments (DENTSPLY Maillefer) using Glyde (DENTSPLY Maillefer) as a lubricant, according to the crown down technique. An X-Smart™ Dual endodontic motor (DENTSPLY Maillefer) was used to control the torque and the speed of the rotary files. During preparation, the canal was copiously irrigated with 5.2% sodium hypochlorite and 17% EDTA solution. Root canals were irrigated again with normal saline and dried using paper points. Before Obturation, master points were seated to test their suitability to canals and radiograph was taken (Fig-1C). The canals were obturated with selected master gutta-percha cone (variable taper) and AH-Plus sealer (DENTSPLY Maillefer Company, USA). The coronal gutta-percha cones were sheared off using heated instrument and vertical compaction was done using the heated pluggers at the individual canal orifices. A temporary restoration with IRM was placed and post Obturation radiograph taken (Fig-1D). The patient was recalled after 1 week for a permanent adhesive composite restoration (Clear Imajesty™, Kuraray America, Inc. NY, USA) of the access cavity. At the 6 months, 1 year follow-up examinations, the patient was comfortable without any symptoms.



Fig-1A: Pre-operative radiograph



Fig-1B: Working length radiograph showing files in both root canals

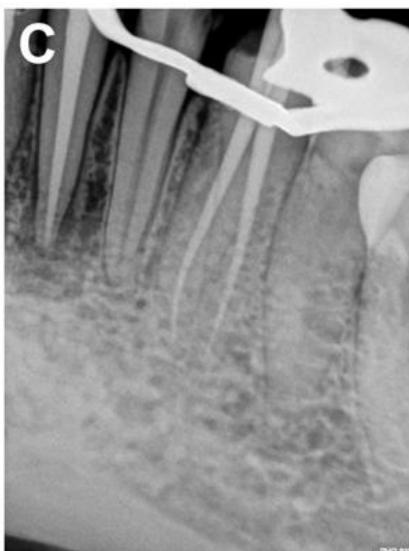


Fig-1C: Check in radiograph showing seated master gutta-percha cones in both canals



Fig-1D: Post- Obturation radiograph

DISCUSSION

The main objective of root canal therapy is thorough shaping and cleaning of all pulp spaces and its complete obturation with an inert filling material. The presence of an untreated canal may be a reason for failure. Knowledge of anatomic variations is essential because endodontic success is related to a thorough debridement of the root canal system. Mandibular canines are recognized as usually having one root and one root canal in the majority of cases [9]. Pineda & Kuttler [6], Green [5] and Vertucci [8] reported that 15% of mandibular canines presented with two canals with one or two foramina. In some uncommon cases, there may be two roots, and two or three root canals. Laurichesse *et al.*, [9] reported that 2% of mandibular canines presented with one root and two canals and that 1% had two roots and two canals [10]. It is extremely important that clinicians use all the armamentaria at their disposal to locate and treat the entire root canal system. It is humbling to be aware of the complexity of the spaces we are expected to access, shape, clean and fill. We can take comfort in knowing that even under the most difficult circumstances our current methods of root canal therapy result in an exceptionally high rate of success.

CONCLUSION

Together with diagnosis and treatment planning, knowledge of the canal morphology and its frequent variations is a basic requirement for endodontic success. Clinicians therefore should never assume that canal systems are simple. The majority of mandibular canines have one root and root canal, but 15% may have two canals, and a smaller number may have two distinct roots, both of which should be identified and managed.

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REFERENCES

1. Sjögren, U. L. F., Hägglund, B., Sundqvist, G., & Wing, K. (1990). Factors affecting the long-term results of endodontic treatment. *Journal of endodontics*, 16(10), 498-504.
2. Nair, P. R., Sjögren, U., Krey, G., Kahnberg, K. E., & Sundqvist, G. (1990). Intraradicular bacteria and fungi in root-filled, asymptomatic human teeth with therapy-resistant periapical lesions: a long-term study. *Journal of endodontics*, 16(10), 498-504.
3. Bellizzi, R., & Hartwell, G. (1983). Clinical investigation of in vivo endodontically treated mandibular anterior teeth. *Journal of endodontics*, 9(6), 246-248.
4. Ingle I. J., & Beveridge E. E. (1976). *Endodontics*. 2nd edn. Philadelphia: Lea & Febiger, 128-129.
5. Green, D. (1973). Double canals in single roots. *Oral Surgery, Oral Medicine, Oral Pathology*, 35(5), 689-696.
6. Pineda, F., & Kuttler, Y. (1972). Mesiodistal and buccolingual roentgenographic investigation of 7,275 root canals. *Oral Surgery, Oral Medicine, Oral Pathology*, 33(1), 101-110.
7. Kaffe, I., Kaufman, A., Littner, M. M., & Lazarson, A. (1985). Radiographic study of the root canal system of mandibular anterior teeth. *International Endodontic Journal*, 18(4), 253-259.
8. Vertucci, F. J. (1974). Root canal anatomy of the mandibular anterior teeth. *The Journal of the American Dental Association*, 89(2), 369-371.
9. Laurichesse, J. M., Maestroni, F., & Breillat, J. (1986). *Endodontie clinique*. Éditions CdP.
10. D'Arcangelo, C., Varvara, G., & De Fazio, P. (2001). Root canal treatment in mandibular canines with two roots: a report of two cases. *International Endodontic Journal*, 34(4), 331-334.