

Endodontic Management of Missed Canal in Two Rooted Mandibular Canine with Two Canal Diagnosed Using CBCT: A Rare Case Report

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ABSTRACT

Background: To address the importance of a permanent lower canine with two roots for dental identification considering the internal and external morphology of the canine roots. The knowledge of root canal system of different human teeth is a “road map” for the successful root canal treatment. 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. In majority of cases, mandibular canines have one root and one root canal, although 15% may have two canals. Literature report shows incidence of two-rooted canine as low as 1.7%. This article reports a clinical case of endodontic treatment of mandibular canine with two roots and two canals. The clinicians must always suspect anatomical varieties and use all the available tools to diagnose and manage their cases.

Keywords: Anatomic variation, CBCT, Mandibular canine, Two roots.

INTRODUCTION

Successful root canal therapy requires a thorough knowledge of tooth anatomy and root canal morphology.¹ The aim of endodontic treatment is the elimination of infection from the root canal system and the prevention of reinfection. Morphologic features of tooth may also adversely affect endodontic procedures. Many clinicians have the perception that a given tooth will contain a specific number of roots and/or canals. Careful evaluation of research material has shown that variations in tooth morphology are common.² Numerous studies done by various authors 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%.^{3,4} The following clinical

case report illustrate the nonsurgical endodontic management of mandibular canine with two roots and two root canals.

CASE REPORT

A 32-year-old female patient reported to Department of Conservative Dentistry and Endodontics with a chief complaint of pain in lower right front region from last 3 months. Patient was underwent endodontic treatment 2 years before. Diagnostic radiograph revealed tooth with two roots and two roots canals, only one canal of tooth was obturated (Fig. 1). Thermal and electric pulp tests showed delayed response. Patient was diagnosed with irreversible pulpitis. Cone-beam computed tomography (CBCT) was performed to confirm two separate roots and root canals (Fig. 2).

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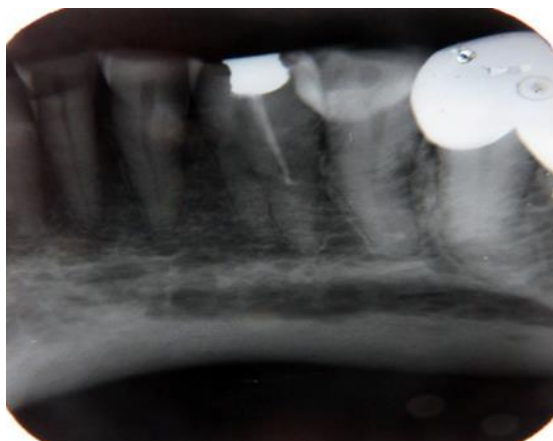


Fig 1: Preoperative radiograph.

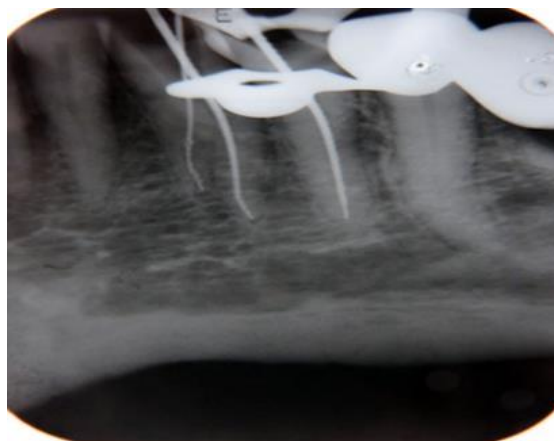


Fig 4: Working Length IOPA.

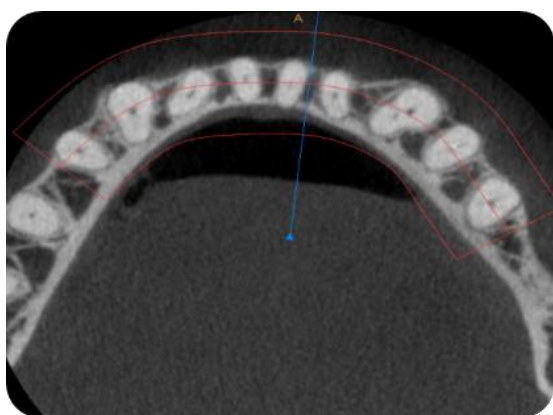


Fig 2: CBCT Showing Two Canals.



Fig 5: Access Cavity Showing 2 Canals.



Fig 3: Radiograph after Gutta-Percha Removal.



Fig 6: Master Cone Selection.

Endodontic treatment was initiated after administering local anesthesia. Rubber dam was placed and endodontic access was performed with a round diamond point bur. The access cavity was carried out, and the outline extended bucco-lingually to accommodate the buccal and lingual

root canal. Old gutta percha was removed from the canal and working length was established radiographically for both canals (Fig. 3 and 4). Chemo mechanical preparation was performed using Self Adjusting File system. The instrument was used with a manual in-and-out motion to the

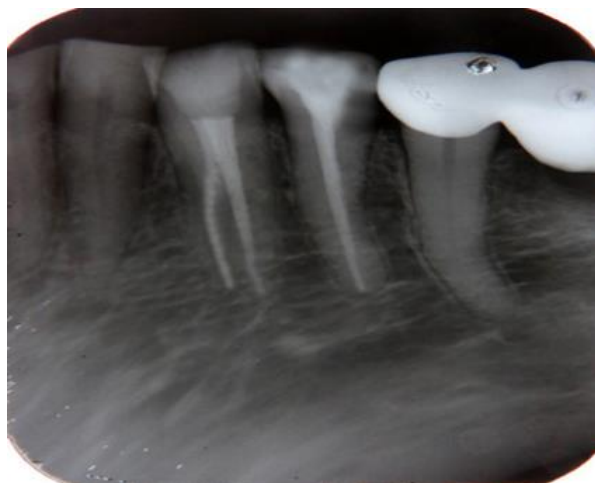


Fig 7: IOPA after Obturation.

working length. A 3% solution of sodium hypochlorite and 17% ethylenediaminetetraacetic acid were used alternatively as irrigants at every change of instrument and endoactivator was used for irrigation. Before obturation, the root canals which were dried by paper point (Fig. 5), master cone were selected and the obturation was achieved by using thermoplasticized gutta purcha and E and Q system by the help of AH-Plus Sealer (Fig. 6). After 1 week, patient reported asymptotically and final restoration was performed. Post-obturation radiograph was recorded (Fig. 7).

DISCUSSION

Proper diagnosis and identification of the number of roots and root canals are key factors for effective endodontic treatment.⁵ Good quality radiographs taken at different angulations some with file in place are very helpful in finding and locating extra canals.⁶ In case of additional root canals if not detected are major reason for failure of endodontic treatment.⁷

Mandibular canines having one root with single canal are common, however, two root canals and in some extraordinary cases, there may be one or two roots with three root canals have been reported. In a study conducted on internal anatomy of mandibular canines, analysis showed that 98.3% had only one root, 4.9% two canals and one foramen, 1.2% two canals and two foramen. Two canals and two roots were present in 1.7% of cases.⁸

More recently, CBCT has become a boom in the field of endodontics to identify the variations in tooth

from norm, curvature, bifurcation and determining accurate length of the tooth in both sagittal and axial planes compared to conventional radiographs to obtain optimal success in conventional root canal therapy.⁹ In the present case, Self-Adjusting file system were used for instrumentation and root canal space was filled by thermoplasticized gutta-purcha technique. Endodontists should always search for two canals in mandibular canines during endodontic treatment, even in single-rooted teeth. Green observed two canals in a single root in 13 out of 100 mandibular canines examined. This is consistent with the findings of Hess, who observed two canals in 15% of the cases. Vertucci reported the presence of two canals in 18% of the mandibular canines. Mandibular canines with two separated canals also demonstrated in a recent case report. 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.³ This paper also presents successful management of mandibular canine with two roots and two separate canals

CONCLUSION

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. Careful interpretation of conventional radiographs with different angulations and use of advanced radiographic tools such as CBCT is helpful to evaluate complex root canal anatomy.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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