

A variation anatomy of mandibular canine with successful endodontic management

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ABSTRACT

Knowledge of development of the teeth and their natural anatomy is applicable to clinical practice, especially during root canal therapy. Although endodontic treatment of mandibular canine generally offers no difficulties, it is advisable to always be aware of the possibility of variations in its internal anatomy. Mandibular canines are recognized as usually monoradicular i.e., single rooted, in most of the cases although approximately 15% may have two canals. Further the incidences of two rooted canine with two root canals is as low as 1.7%. This article presents a case of mandibular canine having two roots with two canals and its successful endodontic management.

Key words: Mandibular canine, anatomical variations, two roots, two canals, endodontics

Introduction

A successful endodontic treatment depends mainly on the ability to completely clean and seals the root canal system. [1] Therefore, it is mandatory for the clinician to have through knowledge about the canal configuration of the teeth. Ignorance of internal anatomy leads to the failure of endodontic treatment. [2]

The internal anatomy of the radicular canals does not always indicate the outer shape of the tooth. [3] From a morphological standpoint; mandibular canine is usually a single rooted tooth with single canal. [4, 5] The occurrence of two canals and even more two roots is rare,

ranging from 1% to 5%. [6] Although the prevalence is low, the clinicians should consider all the possible variations in the number of roots and canals for complete treatment. The following case report describes endodontic treatment of mandibular canine with two roots and two canals.

Case Report

A 39 years old female patient reported to the department of Conservative Dentistry and Endodontics, JSS Dental College and Hospital, Mysore, India, with a chief complaint of pain in lower left canine since a week. Clinical examination revealed

discolored 33. It was tender to percussion with evidence of intraoral sinus. Pre-operative radiographic examination revealed 33 with two roots and two root canals with diffuse periapical radiolucency. (Fig 1)

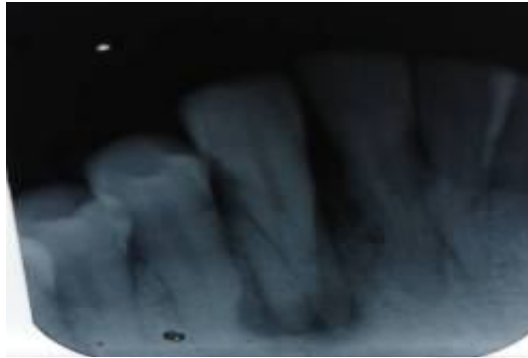


Fig. 1 Pre-Operative radiograph showing two canals with two roots

Prior to the initiation of root canal treatment, patient was explained about the aberrant root canal morphology. Rubber dam was placed and access cavity was prepared with round diamond point and Endo-Z tapered safe end bur (Dentsply Maillefer, Switzerland). The orifices of labial and lingual roots were located using DG-16 endodontic explorer (Hu-Friedy, Chicago, IL, USA). Canals were negotiated using #10 K file (DENTSPLY Maillefer, Switzerland). For straight line access, Galaxy files™ (Plastic Endo, Lincolnshire, USA) were used with crown down method to enlarge the orifice. Working length was established with the help of electronic apex locator (Root ZX, DENTSPLY, Switzerland) and confirmed with radiograph (Fig 2) followed by cleaning and shaping by step back instrumentation technique. Alternative irrigation was done using 5.25% sodium hypochlorite and normal saline. Canals were dried with paper points and calcium hydroxide dressing was placed for 15 days.

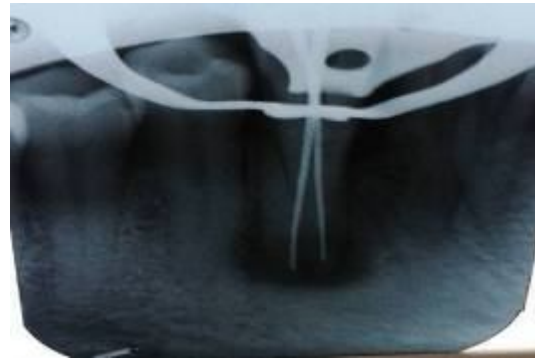


Fig. 2 Working Length Determination

On the second visit, tooth was asymptomatic, and sinus tract had healed. Temporary restoration and calcium hydroxide dressing was removed. Both canals were then obturated with combination of lateral and vertical condensation using Gutta percha and AH Plus sealer (DENTSPLY Maillefer, Switzerland) (Fig. 3)



Fig. 3 Post Obturation Radiograph

Discussion

This case is unusual as it has two roots and two canals. As many of the literature shows percentage of the single root and single canal is 95.8%. Hence this case report stands out from the normal routine case. The vast majority of the problem that occurs during the root canal treatment is due to the insufficient knowledge of the anatomy of the endodontic space. [7] The anatomy of root canal system dictates the condition under which root canal therapy is

carried out and can directly affect the prognosis. Extra root or root canal if not detected is a major reasons for failure of the treatment. Incomplete removal of all the irritants from the pulp space may increase the possibility of treatment failure.^[3]

The initial diagnostic radiograph is extremely important because it allows for the identification or suspicion of root and root canal anatomical variations.^[8] An ideal scout radiograph provides information about the mesio- distal root canal orientation and a subsequent IOPA radiograph with mesial or distal angulations will provide information about the facio-lingual root canal orientation.^[9]

Also, pre- operative radiographs should be observed with careful attention. A sudden change in the radiographic density of the pulp space usually indicates an additional canal, whereas a sudden narrowing of or even disappearance of the root canal space indicates a bi or tri furcation of root. In case of post –operative radiograph, if obturating material is not centered within the root, it may be a sign of a missing canal.^[10]

Intracanal medicament is an antimicrobial agent that is placed in the canal between the appointments. Calcium hydroxide is utilized to reduce pain, helps in eliminating apical exudates and prevent contamination between appointment.^[11] Calcium hydroxide is used because the ph at the periapical region in the infected canal will be acidic which gets converted into basic ph by calcium hydroxide.^[12]

Successful endodontic management of the involved tooth starts with good pre-operative radiographs, a proper access cavity preparation, and optimum obturation of all the root canal system. An adequate

armamentarium is required, namely recent diagnostic techniques like RVG, dental operating microscope, CBCT which help complete diagnosis and plan appropriate treatment.

Conclusion

The variability of symptoms and diagnostics and therapeutic difficulties make the treatment of missed anatomy a challenge for the endodontist; consequently, treatment of these difficult cases should be managed with advanced training.

Even though the most common anatomy of mandibular canine comprises a single root and a single 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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