CASE REPORT

Endodontic Therapy of Mandibular Canines with Two Canals in a Single Root

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ABSTRACT:
Mandibular canines have less anatomical diversities than other teeth.Mandibular canine is generally asingle rooted tooth with one wide root canal.This case describes the root canal treatment of a mandibular canine with two completely separate root canals in a single root. Clinical and radiographic examination revealed a mandibular canine with carious lesion and pulp exposure, tender to percussion.The precise understanding of the dental endocanalicular system's anatomy is critical in the success of the root canal management.
Keywords: Mandibular canine,Endodontics, Two canals, Anatomical variations

INTRODUCTION:

The objective of endodontic therapy is the eradication of infection from the root canal and the prevention of reinfection.[1]Abnormal root and root canal morphology can be found associated with any tooth with varying degree and frequency and affects endodontic management.[2] Knowledge of the root canal anatomy is the basic pre-requisite for successful completion and outcome of endodontic treatment.[3] Mandibular canines'anatomy usually presents just one wide canal associated with a single root.[2]In mandibular canine, the occurrence of two roots and more than two root canals is rare, ranging from 1% to 5%.Most of the lower canines'studies(98.3%) presented a single root, with three internal variations, one canal and one foramen(92.2%), two canals and one foramen(4.9%), two canals and two foramina (1.2%).This paper reports the case of a patient with mandibular canines with a single root and two entirely separated root canals.

CASE REPORT:

A 47-year-old woman patient reported to Department of Operative and Endodontics of Bahria Dental College with the chief complaint of pain in lower left anterio region for the last one week.The clinical examination revealed that the mandibular left canine had proximal caries involving pulp. Periapical radiograph showed pulp exposure and patient was diagnosed with irreversible pulpitis.Any unusual medical histories were not revealed. Informed consent was obtained and root canal procedure was started after administrating local anesthesia,2% lidocaine.Rubber dam was placed and endodontic access cavity was created through the center area of the lingual surface using a long-shank, round bur on a high-speed handpieceand an Endo Z tapered safe-end bur. Only one root canal orifice was found in the center of the tooth after access cavity opening.The pulp was extirpated completely using a K-hand filesize No. 10 and 15.After removal of infected pulp, another canal toward labial side was visible (Figure1a) The pulp was removed from this canal by using a K-hand file size No. 10 and 15.Working length of both canals was taken with electronic apex locator.The length of the buccal canal was 22 mm and the lingual was also 22 mm and No. 25 K-files wereplaced in both canals (Figure 1b) and radiograph was taken at two different angulations to confirm the presence of extra canals (Figure 2a). Radiograph revealed the presence of two canals and one root. In the next stage, the mechanical treatment was performed.The canals were prepared,using a step back instrumentation techniquewith a hand file with master apical filling up to No. 30.Rinsing of the endodontic space with done with plenty of antiseptic solution, using a 2.5% of sodium hypochlorite as irrigant, at every change of instruments.The canals were dried with sterile paper points.

The root canals were filled with intra-canal medicament with the help of Lentulo-spiral and cavity was sealed with temporary filling material and analgesic was given.After a week, patient was recalled for obturation, she had no pain.Temporary filling was removed, and canals were irrigated with normal saline and dried with sterile paper points. The canals were filled with gutta-percha cones and root canal sealer (Figure 2b).

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Received: 13-12-2015
Revised: 05-01-2016
Accepted: 07-01-2016

Figure: 1a
Two canals in left lower mandibular canine
(one Lingual and Labial)

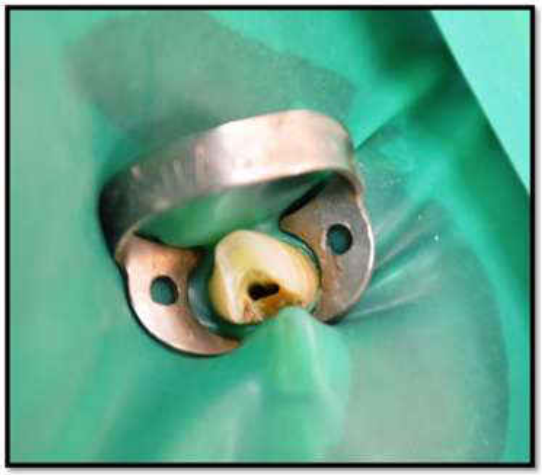

Figure : 1b
Left lower mandibular canine with two K-file No. 25 in both canals

Figure: 2a
Radiograph of working length of left lower mandibular canine with two K-file No. 25 in both canals

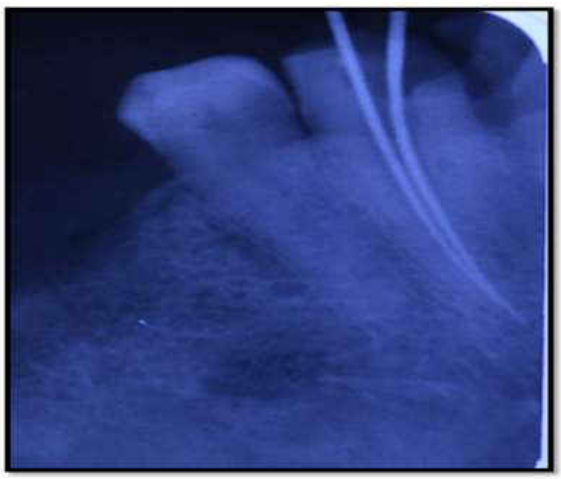

Figure: 2b
Obturation of both canals
(filled with GuttaPurcha points)

DISCUSSION:

Knowledge of anatomic variations is essential because endodontic success is related to a thorough debridement of the root canal system.[2]The mandibular canine is the second longest tooth in dentition.[5] It is only 1-2 mm shorter than the upper canine.[6]

On studying the literature it becomes seeming clear that there is disagreement of opinion as to the structure of root canal of human permanent teeth. The occurrence of two canals in single rooted tooth has been reported to be as low as 0.0% and as high as 6.25%[7]. Incidence of one root with two canals in mandibular canines was detected by several authors.[5,6,7] Hess in 1921, Barrett in 1925, Pucci and Rei in 1944, Madeira in 1973, De Deuss in 1982, all have demonstrated the case of single root and two canals.[6,7,8]In 1972, Pineda F and Kuttler Y found that 18.5% of the mandibular canines had two canals through a study on 187 radiological images.[9] Green D reported 13% in 1973 following the analysis of 100 teeth.[10]Hession reported 11% in 1977.[11]Similar results were obtained by Kaffe I et al. in 1985, in a radiological study on 400 mandibular canines, in vivo, which showed a percentage of 13.75%.[12]Laurichesse et al in 1986 informed that 2% of mandibular canines presented with single root and two canals and 1% had two roots and two canals.[13]Our case report demonstrated two canals in a single root. In 2006, Bakianian studied 100 canines by using the stereomicroscope; he noticed the occurrence of two radicular canals in 12% of the cases.[14]Another study conducted on internal anatomy of mandibular canine, showed that 4.9% had two canals and one foramen, 1.2% had two canals and two foramina.[15] According to Vertucci, in single-rooted mandibular canines, type II and type III configurations may be found in 14% and 3% of the cases, respectively.[16]

Other researchers have performed in-vitro studies using sectioning[9] or radiographic[10] techniques: they also reported that about 15% of single-rooted lower caninesshowed two canals with one or two foramina.The anatomy of root canal system dictate the condition under which root

canal therapy is carried out and can directly affect this prognosis.[16] Extra root or rootcanals if not detected, remain a major reason for failure of treatment.Incomplete removal of all the irritants from the pulp space may increase the possibility of treatment failure.

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.

Conflicts of interest: The authors have no conflicts of interest relevant to this article.

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