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IP Indian Journal of Conservative and Endodontics

Journal homepage: https://www.ijce.in/

Case Report

Management of mandibular central incisor with two canals

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ARTICLE INFO

Article history:
Received 31-01-2023
Accepted 06-04-2023
Available online 25-05-2023

Keywords:
Mandibular Central Incisor
Morphology
Computed tomography
Root canal treatment

ABSTRACT

The dentist lacks the necessary knowledge and understanding of root canal morphology or lacks the experience and ability to navigate the canal, they frequently fail to notice the presence of a canal and leave it untreated. This case report emphasize on necessary knowledge of tooth morphology a clinician should have to avoid endodontic failure in patients who have two canals in mandibular incisor.

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1. Introduction

Inadequate understanding of the anatomical variations in root canals is the primary cause of endodontic failure. Because the dentist lacks the necessary knowledge and understanding of root canal morphology or lacks the experience and ability to navigate the canal, they frequently fail to notice the presence of a canal and leave it untreated. Before beginning endodontic treatment, the dentist must be well-versed in root canal morphology. The entire root canal anatomy should be investigated, properly cleaned, and filled to ensure a positive prognosis after root canal therapy. Because of this, practitioners need to be conversant with the many root canal layouts.[1]

Radiographic examination, root sectioning, staining and cleaning techniques, direct microscope observation, sectioning and macroscopic observation, stereomicroscopy, spiral computed tomography, and cone beam computed tomography have all been used to analyse root canals. Vertucci examined the root canal morphology in removed mandibular anterior teeth using the clearing procedure. It has been claimed that staining and cleaning make it possible to see the intricate features of the root canal system. Additionally, this procedure eliminates need for instrument canal negotiation, preserving the canals' original shape and relationship, and offering a three-dimensional picture of canals.[2,3]

The mandibular incisors treated in this case study have two distinct canals that combine into one canal before leaving the tooth through one apical foramen.

According to research on mandibular incisors, 11–68% of these teeth have two canals, albeit in many of these instances and they tends to join into one in apical 1-3 mm of the root.[4–8]

2. Case

A 51-year-old male patient who was experiencing discomfort and pus discharge around his lower front tooth from five days visited the department of conservative dentistry and endodontics. Also disclosed was the patient's history of hypertension.

After receiving the patient's signed agreement and explaining the entire situation, his clinical evaluation was carried out which shows generalised, severe attrition in mandibular anteriors. A pinpoint spot with pus draining

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https://doi.org/10.18231/j.ijce.2023.022
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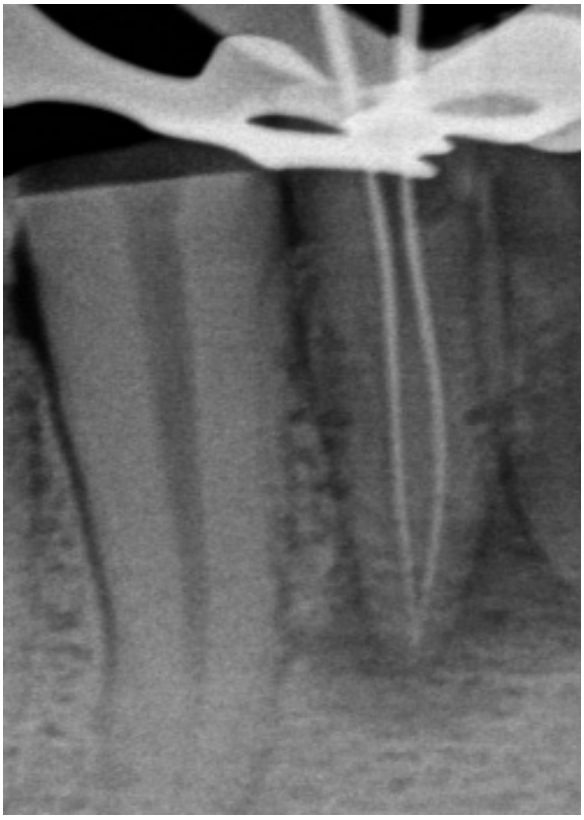

Fig. 1: Radiograph depicting working length of right mandibular central incisor

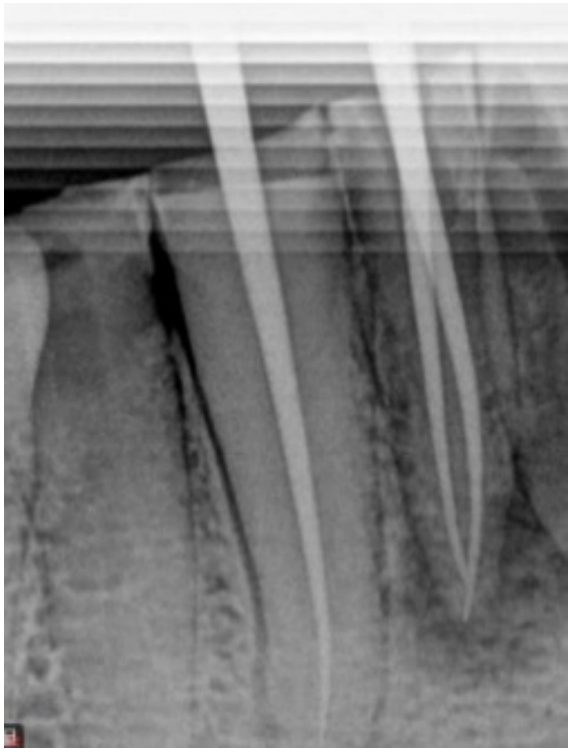

Fig. 2: Master cone radiograph of right mandibular central incisor

from it on pressing was noticed. Therefore, sinus tract was observed in relation to the right central incisor of the mandible.

The patient was made aware of the need for a root canal for that particular tooth. Local anesthesia of lidocaine was administered and followed by further treatment procedure under rubber dam isolation. The working length was checked with an apex locater, verified by an intraoral periapical radiograph, and an access cavity was created using a rubber dam under adequate isolation. In the digital radiograph taken while working length was being recorded, a second canal was seen. Presence of additional canal that is lingual canal was then discovered and access cavity of 41 was expanded buccolingually, and into the cingulum gingivally (Figure 1). Using a no. 10 k file, the patency was examined and via digital radiography, 15 no. K file and a 20 no. K file were inserted into the buccal and lingual canals, respectively, to determine the working length. Using various angulations, the existence of distinct canals was proven. Using standard hand tools, biomechanical preparation was completed. The irrigation solution consisted of 17% EDTA and 2.5% sodium hypochlorite. After every instrument change, the canals were washed with regular saline. The discomfort and tenderness had lessened by the time the patient was summoned back after five days. The tooth was asymptomatic on the following visits and mastercone radiograph was taken. Both the canals were meeting at the apex and periapical lesion also started to heal because of calcium hydroxide dressing. Further, obturation was done.

3. Discussion

A successful endodontic procedure depends on an access preparation that is thoroughly well defined. Without sufficient access, it becomes challenging to handle tools and materials correctly in highly complicated & challenging root canal systems. When cavities are properly prepared, healthy tooth structure is also preserved, making it possible to directly access apical foramina or, at very least, the early curve of the canal. Due to their small size and interior structure, mandibular incisors may have the hardest access cavities to prepare. Because such teeth frequently contain two canals and are buccolingually orientated and lingual canal is mostly ignored, complete excision of the lingual shoulder is essential. The clinician needs to extend the access opening well into the cingulum gingivally, so that if it is present, then will be placed right underneath it & to prevent missing lingual canal. The buccal canal is easier to find when there are two canals, and it is typically straight as compared to lingual canal, which mostly hidden by lingual shelf. The mandibular incisors' missing lingual canals were discovered in this instance after the access aperture was extended lingually beneath the cingulum. Therefore, it is crucial to thoroughly assess the radiographic features obtained from various angles prior to initiating endodontic

therapy. One must be cautious when opening the access, enlarge the mandibular incisors buccolingually, and stretch the gingiva below the cingulum in order to find another canal lingually.

4. Conclusion

The primary reason that root canal treatment of the mandibular incisor failed was, failure in locating and treating second canal, usually a lingual canal. This necessitates careful examination of radiographs obtained from diverse perspectives. It's best to extend the access cavity bucco-lingually & gingivally beneath the cingulum if each mandibular incisor has more than one lingual canal.

5. Conflicts of Interests

The authors have no financial interests or conflicts of interests.

6. Source of Funding

None.

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Cite this article: Joon A, Arya A, Grewal MS, Thapak G. Management of mandibular central incisor with two canals. *IP Indian J Conserv Endod* 2023;8(2):115-117.