

Mandibular Incisor with Two Canals: A Case Report

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ABSTRACT

Mandibular incisors may present as a tooth with two root canals which is a variation in the normally encountered root canal morphology of the tooth. Such variation may be a reason for repeated visits to dentists even after complete debridement and obturation of the main canal. The following case report presents a case where the patient had two canals in all of his mandibular anteriors requiring root canal treatment in one of the tooth which was timely identified and treated adequately.

Key Words: Mandibular incisors, Two canals, Variation

INTRODUCTION

The morphology of mandibular incisors that we routinely encounter is single rooted with three pulp horns and a single root canal. But many authors have warned us regarding incidence of high number of variation in these tooth in the form of an extra root canal which further complicates not only the anatomy but also treatment protocol. Knowledge of tooth morphology along with its variations is a prerequisite for success of any root canal treatment.[1-3] If the operator is unaware of the fact that this tooth may present with an extra canal it may lead to non-healing of the lesion and subsequently to the failure of the treatment besides following all the protocols for a good endodontic treatment.[4]

This extra canal when present may be encountered as a bifurcation of the main canal that splits into two separate canals or as a separate canal. Literatures suggest that more than 40% of mandibular incisors have two canals and more than 1% have two separate apical foramina.[5] In another study authors found out that 41.4% of the 364 mandibular incisors clinically examined had two separate canals.[6] Funato et. al reported a case where there was inadequate treatment of mandibular incisor with two canals which subsequently lead to the failure of the root canal treatment in the patient.[7] The present case signifies the importance of adequate exploration of the canal system prior to commencement of root canal therapy for additional canals that may be present in mandibular incisors.

We present here a relatively rare case where the patient had two canals in all of his mandibular incisors although all of them did not require root canal therapy.[8] Here adequate root canal treatment of the offending tooth was done which had two canals that merged before exiting from a single apical foramen.

CASE DESCRIPTION

A 42 year old male visited the Department of Conservative Dentistry and Endodontics with the chief complaint of pain in his lower front tooth since 10 days. On examination the tooth was attrited and tender to percussion. Diagnostic radiograph revealed two canals in all the anterior teeth with widening of periodontal ligament space of mandibular right central incisor.(Fig 1) Access cavity was prepared well into the cingulum after complete removal of the lingual shoulder. (Fig 5) Careful probing with number 10 k file confirmed the presence of two canals. Working length was determined (Fig 2.) and the canals were cleaned, shaped and obturated (Fig 3.)(Fig 4.) adhering to the protocol after which composite restoration was done in the tooth. The patient was asymptomatic in the subsequent follow up visits.



Figure 1: Diagnostic Radiograph showing two canals in all the mandibular anteriors

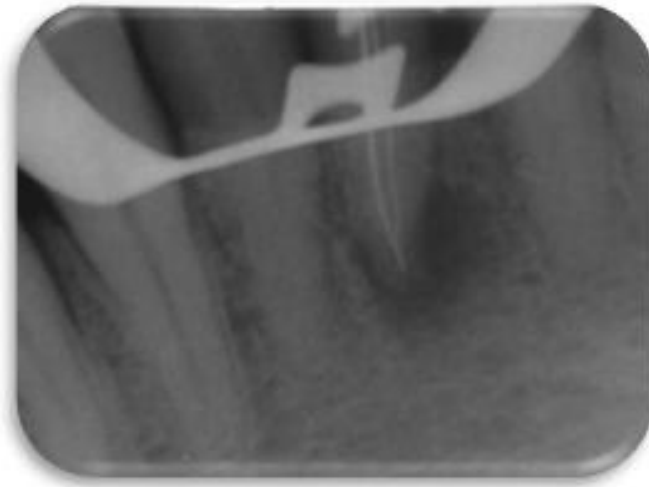


Figure 2: Determination of working length



Figure 3: Verification of the fit of master cones



Figure 4: Post obturation radiograph showing both the canals



Figure 5: Access cavity in mandibular incisor showing two canal orifices

DISCUSSION

Endodontic treatment is a challenging procedure considering the fact that no two canals are same. There is a lot of variation in canal anatomy and with it increases the degree of difficulty that an operator has to face. The case reported here illustrates some difficulties that a clinician may have to face during treatment of mandibular incisors. A frequent reason for unsuccessful treatment of such teeth is failure to recognize and treat these tooth with two canals which leads to subsequent retreatment or surgical interventions which otherwise would not have been necessary. As the presence of two canals may not be readily visible in the radiographs clinicians should be very careful while interpreting the diagnostic radiographs and look for signs that may suggest presence of such variation radiographically as well as clinically. If there is continuous bleeding from the access cavity, eccentric location of file in the canal, inconsistent apex locator readings or persistent pain even after debridement of canals then the presence of two canals should be suspected and a second periapical radiograph with a different horizontal angulation should be taken to confirm it.

One of the major reasons for inability to identify a second canal is inadequate access cavity preparation which leaves a lingual shelf of dentine over the second (usually the lingual) canal thus many researches recommend that mandibular incisors should be treated as tooth with two canals unless otherwise confirmed.[5] It is recommended that the access cavity be extended well into cingulum of the incisor and proper removal of the lingual shoulder should be performed before coming to conclusion of single or two canal entity. Not only identification of canals but preparation and obturation of canals should also be done meticulously in such cases. Whenever two canals are present that merge to form one, literatures suggest that lingual canal is the one with direct access to the apex and only this canal should be cleaned and shaped till apex with cleaning and shaping of the other canal only till the bifurcation as failure to do so may give rise to hour glass appearance of the canal. Same method should be applied during the obturation of canals as well. Adhering to the same protocol the present case was treated and the patient was asymptomatic on subsequent recall visits.

CONCLUSION

The only consistent property of canal morphology is its inconsistency and unpredictability. As an operator we should always keep our eyes and mind open for possible variations in canal morphology and take the help of necessary aids as and when required in order to provide favorable outcome of the root canal treatment.

REFERENCES

1. Reid JS, Saunders WP, MacDonald DG. Maxillary permanent incisors with two root canals: a report of two cases. *IntEndod J* 1993; 26: 246–50.
2. Low D, Chan AWK. Unusual maxillary lateral incisors: case reports. *AustEndod J* 2004; 30: 1–5.
3. Iqbal MK, Gartenberg J, Kratchman SI, Karabucak B, Bui B. The clinical significance and management of apical accessory canals in maxillary central incisors. *J Am Dent Assoc* 2005; 136: 331–5.
4. Katral N, Yanikoglu FÇ. Root canal morphology of mandibular incisors. *J Endod* 1992; 18: 562–4.
5. Carrotte P. Endodontics: Part 4. Morphology of the root canal system. *Br Dent J* 2004; 197: 289–367.
6. Benjamin KA, Dowson J. Incidence of two root canals in human mandibular incisor teeth. *Oral Surg* 1974; 38:122–6.
7. Funato A, Funato H, Matsumoto K. Mandibular central incisor with two root canals. *Endod Dent Traumatol* 1998; 14: 285–6.
8. Al Fouzan K. S, Almanee A, Jan J, Al-Rejaje M, “Incidence of two canals in extracted mandibular incisor teeth of Saudi Arabian samples,” *Saudi-Endodontic Journal*, vol. 2, no. 2, pp. 65–69, 2012.