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Endodontically managed mandibular second molars with a single root and root canal: A case report

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Abstract

The variability of root canal system morphology of multirooted teeth represents a challenge to endodontic diagnosis and therapeutics. Variations of root canal systems need not only be in the form of extra canals. Clinicians should be aware that there is also a possibility of existence of lesser number of roots and root canals than the normal root canal anatomy. The aim of this article is to present the case of endodontically managed mandibular second molars with a single root and root canal.

Keywords: Root canal morphology, single canal, single root

1. Introduction

Confidence Clinicians should be aware that main root canals in a tooth may only provide access to the complexities of the root canal system and must be cleaned thoroughly of all microorganisms [1]. Effective debridement, and obturation is impossible unless and until the practitioner is familiar with the morphology of the roots of all teeth, and the associated intricate root canal anatomy. As long ago as 1925, it became clear that teeth had complicated root canal systems rather than the simplified canals [2]. Routine periapical radiographs helps us to assess the number, length, curvature, and aberration of the canal system of the tooth. Weine [3] categorized the root canal systems into four basic types. Vertucci *et al.* [4] found a much more complex canal system and identified eight pulp space configurations. General anatomical configuration of mandibular second molar is two roots, mesial and distal. The mesial canals lie much closer together, and the incidence of two canals distally is much less. Occasionally, the root canals may join in a buccal fin giving a “C-shaped” canal [5]. C-shaped canal system is common in mandibular molars, especially in Asian population [6]. Walker [7] determined that Asians have different percentages of canal configurations than those reported in Caucasians and Africans. A recent study conducted on Iranian population reported prevalence of 7.2% of C-shaped canals among second mandibular molars and these configurations were mostly seen among single rooted mandibular.[8] Cimilli *et al.* reported 1.3% of mandibular second molars had single canal configuration.[9] This case report presents a case of a single-rooted mandibular second molar with a single canal which is quite rare.

2. Case report

A 45-year-old male reported to the dental clinic with pain in relation to her mandibular left second molar, whose medical history was not significant. On oral examination, tooth revealed a deep caries and responded positively to percussion but not on palpation. Intraoral periapical radiograph revealed radiolucency in the crown involving the enamel, dentin and pulp suggestive of a pulpal involvement [Fig 1]. The root canal morphology confirmed the single root with a single linear canal, constricting toward the apex. Slight periradicular changes were seen. Tooth was isolated and under adequate anesthesia, an access cavity was prepared. Only a single round orifice was made in the middle portion of the floor of the pulp chamber. Pulp was extirpated and working length was determined [Fig 2] and confirmed using apex locator (Propex, Dentsply). Cleaning and shaping was done by crown down technique using ProTaper files. A thorough irrigation with sodium hypochlorite and saline was done. Gutta-percha (GP) Pro-Taper was selected as a master cone obtain an apical tug back [Fig 3]. Lateral condensation with GP points was done for a good obturation. The obturation was further confirmed with a radiograph [Fig 4] and postobturation restoration was done with light cure composite.

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Fig 1: Pre-operative RVG

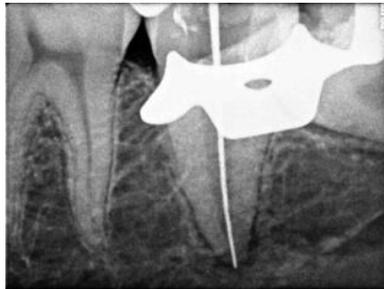


Fig 2: Determination of working length



Fig 3: Master cone RV



Fig 4: Post obturation RVG

3. Discussion

The study of root anatomy of teeth has an endodontic significance. Mandibular second molars usually have two roots and three root canals but variations in the number of roots as well as canal morphology are not rare. In 1979, first description of the term C-shaped root canal was done.^[10] C-shaped canals are mostly seen in permanent mandibular second molars but they can also be found in maxillary first molars, maxillary second molars, and mandibular first and second premolars, third molars, as well as in mandibular first molars.^[10] In a recent study,^[11] a 30% prevalence of C-shaped canals in the Hong Kong population was seen which was lower than that reported by Walker^[7] (52%) and Yang *et al.*^[12] (32%) A study of Iranian population reported prevalence of 7.2% of C-shaped canals in second mandibular molars, which were mostly among single rooted mandibular teeth while another study reported type I canals,^[13] but very few mention of single canal with a round or oval orifice in a

second mandibular molars.^{[14],[15]} In the present case, initial evaluations of the periapical radiographs suggested the presence of single root with a wide canal space suggesting that there may be C-shaped configuration of canals. After access cavity preparation, on observation of pulpal floor, only one canal with a round orifice was located, suggestive of the presence of a single canal only. Further exploration of the pulpal floor did not revealed presence of any other orifice opening. The canals of these teeth were wide and tapering biomechanical preparation and copious irrigation was done to ensure complete removal of debris from the canal system. The canal was obturated with GP point and resin based sealer using lateral condensation technique. Here, we used ProTaper GP as master cone and normal GP points for lateral compact obturation. A postobturation radiograph showed a well obturated canal.

4. Conclusion

A thorough understanding of the complexity of the root canal system is essential for understanding the principles and problems of shaping and cleaning, for determining the apical limits and dimensions of canal preparations, and for performing successful root canal treatment.

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