International Journal of Applied Dental Sciences 2018; 4(4): 77-78

ISSN Print: 2394-7489
ISSN Online: 2394-7497
IJADS 2018; 4(4): 77-78

www.oraljournal.com
Received: 09-08-2018
Accepted: 13-09-2018

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Management of mandibular second molar with single root and single canal: A rare occurrence

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Abstract
Philosophy on the root canal anatomy is essential for a successful root canal therapy. This case report presents a rare anatomy of root canal system in a mandibular second molar. Access cavities displayed only one round /oval canal orifice which is very unique. A clinican thus requires to have passable knowledge about root morphology and its variation.

Keywords: mandibular second molar, single root, single canal

Introduction
Although philosophy of the root canal anatomy is necessary to achieve appropriate chemomechanical therapy of the root canal system and ensure for the success of endodontic treatment [1] Typically, the mandibular second molar presents with 2 well-defined roots: a mesial root with two canals and a distal root with one or two canals. Variations in the form, configuration, and number of root canals in mandibular molars have been discussed extensively in endodontic literature [2, 3]. A different morphological variation of the root and the root canal system among the mandibular molar provides a constant challenge for the diagnosis and root canal treatment point of view [4]. Vertucci type I canals were most frequently seen in these C-shaped molars [5]. A study by Weine *et al* reported 1.3% of mandibular second molars had Single Canal Configuration [6]. The purpose of this case report is to report occurrence of single canal in single rooted mandibular second molars that required endodontic therapy [1].

Case report
A 42-year-old male reported to the dental OPD of endodontic department with pain in relation to his mandibular left second molar, whose medical history was non-contributory. The tooth on examination revealed a deep caries. The patient had pain on percussion. Intraoral periapical radiograph revealed radiolucency in the crown involving the pulp suggestive of a pulpal involvement [Figure 1]. The root canal morphology confirmed the presence of a single root with a linear canal, constricting toward the apex. Slight periradicular changes were appreciable. Local anaesthesia was administered, and the tooth was isolated by a rubber dam, an access cavity was prepared. Only a single round orifice was located in the middle portion of the floor of the pulp chamber. After pulp extirpation, working length was determined using a 10no. k file electronically with an apex locator and confirmed by periapical radiography (Figure 2). The root canals were shaped with 6% Pro Taper rotary instruments.5.25% sodium hypochlorite and saline were used during cleaning and shaping procedure. Following cleaning, shaping, and final irrigation with saline, the canals were dried with absorbing paper points Gutta-percha (GP) Pro Taper was selected as a master apical cone to obtain an apical tug back [Figure 3]. Root canals were obturated using the lateral condensation technique The obturation was further confirmed with a radiograph [Figure 4]. Postobturation restoration was done with light cure composite.

Fig 1: Preoperative radiograph showing radiolucency involving pulp of a single rooted left mandibular second molar.

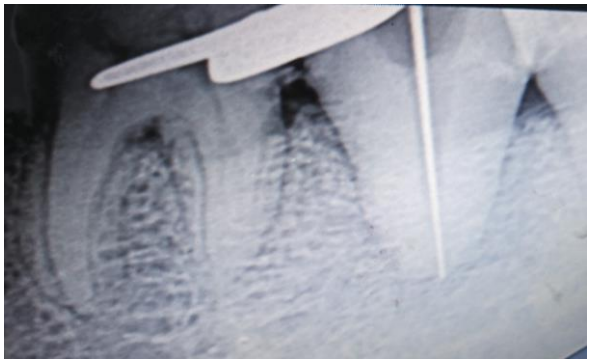

Fig 2: Working length determination radiograph showing single canal.

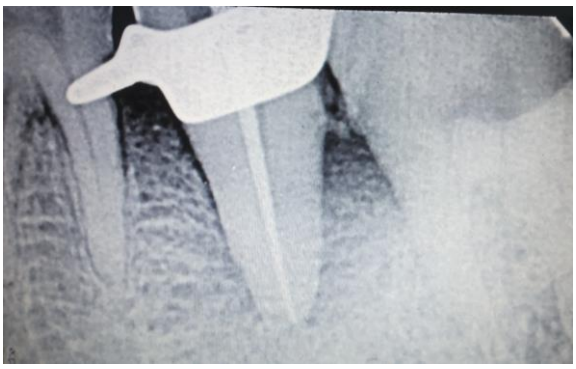

Fig 3: shows mastercone GP (6%protaper) selection radiograph

Fig 4: Shows post obturation radiograph

Discussion

The study of root anatomy of teeth has an endodontic as well as anthropological significance [7]. 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 uncommon [8]. C-shaped canals are commonly found 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 [9]. In the present case, initial evaluations of the radiographs suggested the presence of single root with a wide canal space suggesting that there may be C-shaped configuration of canals [1]. After access cavity preparation, on observation of the pulpal floor, only one canal with a round orifice was located, suggestive of the presence of a single canal [1]. Further exploration of the pulpal floor did not reveal presence of any additional orifice opening. The canals of these teeth were wide and tapering biomechanical preparation and copies irrigation was done to ensure complete removal of debris. The canal was obturated with GP point and resin based sealer using lateral condensation technique. Here, we used 6% Pro Taper GP as master cone. A postobturation radiograph showed a well obturated canal.

Conclusion

Knowledge and recognization of canal configuration can facilitate more effective canal identification and unnecessary removal of healthy tooth structure in an attempt to search for missing canals. The anomalies in the root canal morphology need not always be extra canals. It can also be in the form of fused or fewer canals. From a clinical standpoint, when an unusual anatomic form is encountered, multiple angled radiographs and careful inspection of the will reveal more details of the anatomy of the root canal system.

Cinical significance

Clinicians ought to be aware of complex root canal structures, of cross-sectional dimensions and of iatrogenic alterations of canal anatomy. Careful interpretation of angled radiographs, proper access preparation, and a detailed exploration of the interior of the tooth are essential prerequisites for a successful treatment outcome.

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