IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 16, Issue 10 Ver. XII (Oct. 2017), PP 59-61
www.iosrjournals.org

Endodontic Management of Mandibular Second Molar with Single Root and Single Canal: Report of Two Cases

*Muhammed Abdul Rahman TV[1], Nadira K Rahman[2], Jayasree S[3]
Gokul Raj R[4], Jamshina K[5], Nimmy S Mukundan[6]
[1,2,3,4,5,6]*(Department of Conservative Dentistry and Endodontics, Govt. Dental College, Calicut, India)*
*Corresponding Author: *Muhammed Abdul Rahman TV*

Abstract: *Mandibular second molars commonly have two roots and three canals. Several variations of root canal anatomy of mandibular second molar have been in numerous studies. This can be either extra canals, lesser number of canals or abnormal configurations. Clinician should be aware of all these variations for a successful endodontic therapy. Thus the aim of this article is to report endodontic management of two mandibular second molars with a single conical root and single canal.*

Keywords: *mandibular second molar, single root, single canal*

Date of Submission: 14 -10-2017 Date of acceptance: 27-10-2017

I. Introduction

A thorough knowledge of root canal anatomy and its variation is necessary to achieve appropriate cleaning and shaping of the root canal system and ensure 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 canal. Variations in the form, number of root canals and configuration in mandibular second molars have been discussed extensively in the literature [2,3]. This include four roots and root canals[4], c shaped canalconfigurations[5], entomolaris and paramolaris[6]. Abnormal root canal anatomy can occur in any racial groups depending on various factors like age, sex and ethnicity. Although extra canals are more common, one should be aware of the fact that, there is a possibility of fewer canals than the normally presumed. Multiple angled radiographs aid in the diagnosis of canal abnormalities. Thus the purpose of this case series is to report 2 cases of mandibular second molars that required endodontic therapy.

II. Case Reports

2.1 Case I

A 42 year old male patient reported to the department of conservative dentistry and endodontics with the complaint of pain on lower right back teeth region. The medical history was non contributory. Intra oral examination revealed amalgam filling with a deep caries on distal side of crown of 47.the tooth was tender to percussion. Intra oral periapical radiograph (fig. 1a) revealed radiolucency involving pulp without any periapical changes. A detailed examination of the radiograph revealed a single root with a wide canal and a radioopacity within pulp chamber. Based on these findings a C shaped canal configuration was anticipated. After local anesthesia, access opening of the involved tooth is done under rubber dam isolation. A calcified mass was observed in the centre of pulp chamber which got dislodged (fig. 1b) on exploring with an endodontic explorer. This revealed a single round orifice at the centre of pulp chamber. Working length was determined using electronic apex locator and confirmed by radiograph (fig. 1c). Root canals were cleaned and shaped using K-File.. After each instrumentation the canal was irrigated with 2.5% NaOCl solution. The smear layer was removed with 17% EDTA solution and final irrigation was done with saline. After tooth canal instrumentation the root was dried with sterile paper points and obturation was done using cold lateral compaction of gutta-perch and AH Plus resin sealer (fig. 1d)

Fig. 1a. Pre operative radiograph

Fig. 1b. Calcified pulp tissue

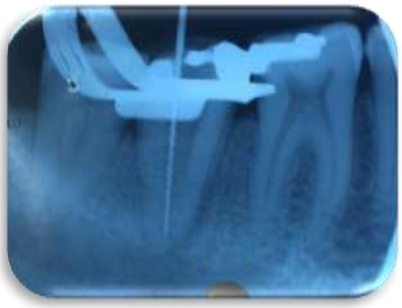

Fig 1c. Working length

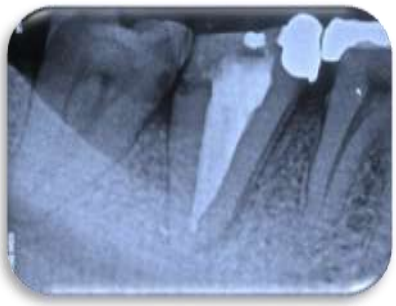

Fig 1d. Post obturation radiograph

2.2 Case II

A 45–yr-old female patient was reported to the department of conservative dentistry and endodontics with a chief complaint of pain in relation to the right mandibular posterior region, since 1 week .Medical history was non contributory. Intraoral examination revealed deep caries in 47. The tooth was tender on percussion. Intraoral periapical radiograph revealed deep caries approximating the pulp without any associated periapical changes. (Figure. 2a) Vitality test for heat and cold were positive. A detailed examination of the radiograph revealed the presence of a single root with a wide canal. .Based on clinical and radiographic finding the condition was diagnosed as irreversible pulpits. Endodontic therapy was decided.

The tooth was anaesthetized by inferior alveolar nerve block using a 2% solution of lignocaine hydrochloride containing 1:80000 adrenaline (Lignox 2% A, Warren, Indoco). The tooth was isolated with a rubber dam. Endodontic access cavity preparation was made with a round diamond bur in a high speed airotor handpiece. The pulp chamber was inspected with the help of a dental operating microscope. Examination of the pulpal floor revealed only a single round shaped orifice located in the middle portion of the floor of the pulp chamber (fig. 2b) and any other canal orifices could not be located. A sharp DG 16 explorer was used to locate the canal orifice. Working length was determined (Fig. 2c) and cleaning and shaping completed by step back method and irrigation with 5.25% sodium hypochlorite solution. A snugly fitting master cone was selected and conformed by a radiograph. The canals were dried and the tooth was temporized. After 1week, the canals were obturated with cold, lateral condensation of gutta percha cones (Dentsply) and zinc oxide eugenol sealer. Post endodontic restoration was given with silver amalgam. A post obturation radiograph was taken. (Fig. 2d).

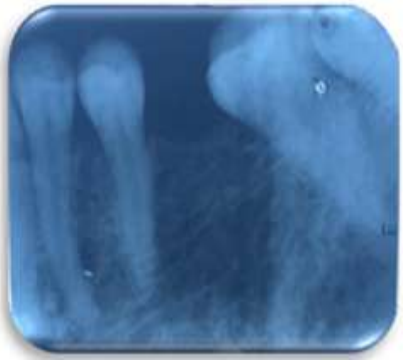

Fig. 2a. Pre operative radiograph

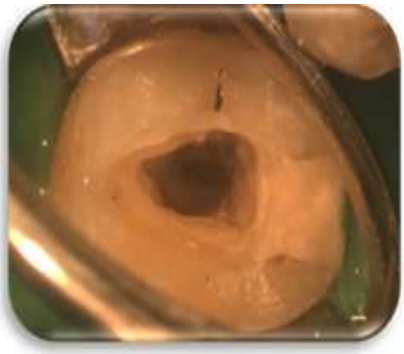

Fig .2b. Microscopic view of pulp chamber

Fig. 2c. Working length radiograph

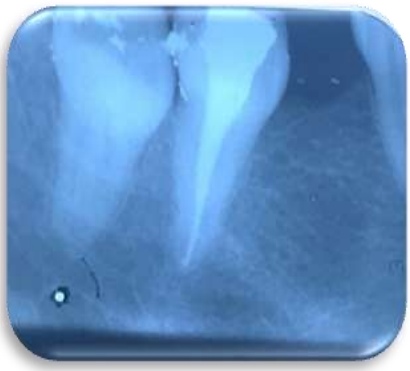

Fig. 2d. Post-obturation radiograph

II. Discussion

A number of anatomical variations have been described in the mandibular second molar and perhaps more variants than any other molars[7]. Proper pre-operative radiograph is an essential tool to recognize fusion, germination and other anatomical anomalies. In this particular case, multiple radiographs in different horizontal angulations clearly identified the presence of single root and single canal. A study by Weine et al reported 1.3% of mandibular second molars had single canal configuration [3]. A recent CBCT study in a Turkish Cypriot population found that95.7% had 2 roots, .47% had 3 roots, .23% had 4 roots and 3.31 % had one root. But only 1.6% had single root and single canal [8]. Saeed Rahimi et in their in vitro study by canal clearing method found that 86.3% had 2 roots 9.3% had one root and 6.3 % were 4 rooted but only 5.7 % had single root and single canal.in this study,they also found that c shaped canal system is more commonly seen in single rooted teeth[7]. Radiographically C shaped canal system appears as a fused root with longitudinal groove in the middle[9]. In the case I, the pretreatment radiograph appeared like C shaped canal system but it was calcified pulp tissue which was remove dwith an endodontic explorer. On removing the calcified mass there appeared a large pulp chamber with single tapering canal. In the case II also a large wide pulpchamber was revealed after access opening. And there were no additional canals on further examination under dental operating microscope. This case series enhances the fact that the variation in canal anatomy can also be in the form of lesser number of canals. Gopi Krishna et al. reported a case of maxillary first molar with a single root and single root canal which was identified using spiral CT [10]. Ioannidis et al. reported a case of endodontic management and cone-beam CT evaluation of seven maxillary and mandibular molars with single roots and single canals in a patient [11]. So the clinician should be aware of these variations with lesser number of canals so as to minimize iatrogenic errors during access cavity preparations, especially during the search of additional or missed canals.

III. Conclusion

Anomalies in root canal system can occur in number, shape and configuration. Knowledge of normal root canal anatomy along with its variations enhances success of endodontic treatment. Multiple angled radiographs along with dental operating microscope greatly help in diagnosis and better treatment of these anomalies.

References

[1]. J. I. Ingle, L. K. Bakland, and J. C. Baumgartner, Endodontics, B C Decker, Hamilton, Canada, 6th edition, 2008.
[2]. F. J. Vertucci, "Root canal anatomy of the human permanent teeth," Oral Surgery Oral Medicine and Oral Pathology, vol. 58, no. 5, pp. 589–599, 1984.
[3]. Franklin S.Weine, Richard A.Pasiewicz, R.Ted Rice. Canal Configuration Of The Mandibular Second Molar Using A Clinically Oriented In Vitro Method. J Endod 1988;14:207-213.
[4]. Peiris R, Ohzeki S, Igarashi Y, Satake T. Mandibular permanent second molar with four roots and root canals: a case report. Odontology 2009;97:51—3.
[5]. Jafarzadeh H, Wu Y. The C-shaped root canal configuration: a review. J Endod 2007;33:517—23
[6]. Calberson F, De Moor R, Deroose C. The radix entomolaris and paramolaris: clinical approach in endodontics. J Endod 2007;33: 58—63.
[7]. Saeed Rahimi,Shahriar Shahi,Mehrdad Lotfi,Vahid Zand,Majid Abdolrahimi,Reza Es haghi. Root canal configuration and prevalence of C-shaped canals inMandibular second molars in an Iranian population.Journal of oral science 2008;50:9-13.
[8]. Berkan Celiktenet al. Cone beam CT evaluation of mandibular molar root canal morphology in a Turkish Cypriot population. Clin Oral Invest 2016
[9]. Fan B, Cheung GSP, Fan M, Gutmann JL, Fan W: C-shaped canal system in mandibular second molars. II. Radiographic.features, J Endod 30:904, 2004.
[10]. Gopikrishna V, Bhargavi N, Kandaswamy D. Endodontic management of a maxillary first molar with a single root and a single canal diagnosed with the aid of spiral CT : a case report. J Endod. 2006; 32(7): 687-91.
[11]. Ioannidis K, Lambrianidis T, Beltes P, Besi E, Malliari M. Endodontic management and cone-beam computed tomography evaluation of seven maxillary and mandibular molars with single roots and single canals in a patient. J Endod 2011;37:103-9.

x*Muhammed Abdul Rahman TV. "Endodontic Management of Mandibular Second Molar with Single Root and Single Canal: Repot of Two Cases." IOSR Journal of Dental and Medical Sciences (IOSR-JDMS) , vol. 16, no. 10, 2017, pp. 59–61.