Mandibular second molar with single root and single canal: A case report

Kamal Krishan Singh[1]*, Akansha Garg[2], Isha Tomar[3], Shashit Shetty B.[4]
BDS, Post Graduate Student[1, 2, 3]
Department of Conservative Dentistry and Endodontics[1, 2, 3, 4]
K. D. Dental College and Hospital, Mathura[1, 2, 3, 4]
kamalkrishan.3238@gmail.com[1]

***Abstract*— A successful endodontic therapy depends upon complete knowledge of the anatomy and the variations present in the human dentition. C-shaped canals with different configuration are common in single rooted mandibular second molars. This case report presents the successful endodontic management of mandibular second molar tooth with a single root and a single canal.**

Keywords*— *Endodontic therapy, C-shaped canals, Mandibular second molar tooth.

I. INTRODUCTION

A good knowledge of root canal anatomy is necessary to achieve appropriate cleaning and shaping of the root canal system and ensure success of endodontic treatment.[1] It has been emphasized that root canal morphology has limitless variability and clinicians must be aware that anatomic variations constitute a intimidating challenge to endodontic success.[2] Periapical radiographs help us to assess the number, length, curvature and aberration of the canal system of the tooth.[3]

Generally anatomical configuration of mandibular second molar is of two roots, mesial and distal.[4] It can also have fused canal to form single conical root with variations within the internal anatomy and often seen is C‑shaped canal.[5] C-shaped canal system is commonly found in mandibular molars especially in Asian population. The prevalence of C-shaped canals in single rooted second molars was 8% using spiral computed tomographic imaging has been reported.[4,6] Weine et al reported 1.3% of mandibular second molars had single canal configuration.[4,6,7]

The purpose of this case report is to present the successful endodontic treatment of a mandibular second molar with single root and a single canal.

II. CASE REPORT

A 25 year old female patient reported to the department with the chief complaint of spontaneous pain in the lower right posterior region since last 8 days. There were subjective symptoms of prolonged sensitivity to hot and cold stimulus. There was no contributory medical history with the same. On clinical examination, the right mandibular second molar had occlusal carious lesion and was tender on percussion. Thermal testing (heated gutta-percha and Endo-Frost) caused an intense lingering pain, whereas electric pulp testing (Parkel Electronics Division, Farmingdale, NY) showed pulpal vitality on tooth 47. A preoperative radiograph revealed radiolucency, with periodontal ligament space widening with single root and single canal (Figure 1).

Figure 1: Preoperative radiographic image

From the clinical and radiographic findings, a diagnosis of symptomatic irreversible pulpitis with symptomatic apical periodontitis was made and endodontic treatment was suggested to the patient. The tooth was anesthetized followed by rubber dam isolation. An endodontic access cavity was established and on examination of the pulpal floor revealed only a single round shaped orifice. The working length determination was done with the help of an apex locator

(Root ZX; Morita, Tokyo, Japan) and confirmed using radiographs (Figure 2).

Figure 2: Working length radiographic image

Cleaning and shaping completed by step back method and irrigation was done using normal saline, 2.5% sodium hypochlorite solution and 17% EDTA, 2% chlorhexidine digluconate was used as the final irrigant. The canals were obturated by cold lateral compaction of gutta-percha and AH Plus resin sealer (Maillefer, Dentsply, Konstanz, Germany) (Figure 3). The tooth was then restored using a posterior composite resin core (P60; 3M Dental Products, St Paul, MN).

Figure 3: Post obturation radiographic image

III. Discussion

This case report highlights the presence of an unusual anatomy in mandibular first molar that had a single root with a single canal. According to Vertucci FJ (1984) mandibular second molar is similar to first mandibular molar, except the roots of mandibular second molar is shorter and more curved compared to mandibular first molar.[8] It has been observed that the occurrence of abnormal anatomy can occur in any racial groups depending on various factors like age, sex and ethnicity that play a role in determining the pattern of the root canal. One of the commonest reported variations occurring in the mandibular second molar is the presence of C-shaped canals. Root fusion that becomes a single root, conical or C-shape form has an incidence of about 21.8 %. The other variations include the presence of two or four canals instead of the commonly occurring three canals, supernumerary roots, taurodontism, additional or lesser number of canals in one or more of the roots.[9]

Radiographic examination is an essential component in endodontic treatment. The use of multiple preoperative radiographs or an additional radiographic view with an angulation of 20 degree mesial or distal direction increases the chances of detecting unusual root canal morphology .[1]

In this case, initial evaluation of the radiographs suggested the presence of only one root with single C-shaped canal configuration. After the preparation of access cavity and on examining the pulpal floor, it was noticed that only one canal with a round orifice was present, suggestive of the presence of a single canal.

IV. Conclusion

Knowledge of canal anatomy and configuration can help in effective canal identification and prevent unnecessary removal of healthy tooth structure in an attempt to search for missing canals. When an unusual anatomic form is encountered, multiple angled radiographs of the tooth in concern will reveal more details of the anatomy of the root canal system.

References

1) Sooriaprakas C, Ballal S, Velmurugan N. Mandibular First Molar with a Single Root and Single Canal. Case Reports in Dentistry 2014;1-4.
2) Venugopal N, Saravanan P, Dasarathan D, Rajamani I. Second Molar with Single Root and Single Canal. Ind J Multidisci Dent 2010; 1(1): 37-39.
3) Sharma S. Single Rooted Mandibular Second Molars with Single Canal. Journalofdentofacialsciences 2013; 2(3): 27-30.
4) Shetty N, Singh V, Rijal S. Single rooted mandibular second molars with single canal: Rare occurance. Secretary's Message 2009; 4: 55-59.
5) Ingle JI, Bakland LK, Baumgartner JC. Ingle's Endodontics, 6th edition,BC Decker Inc 2008 : pg 209.
6) Sujith, R, Kiranmurthy D. Mandibular second molar with single root and single canal-A case report. Ind J Clin Dent 2011; 2(5):140-142.
7) Kathuria A, Chaudhry S, Talwar S, Verma M. Endodontic management of single rooted immature mandibular second molar with single canal using MTA and platelet-rich fibrin membrane barrier: A case report. J Clin Exp Dent 2011; 3(5): e 487-90.
8) Chaurasia VR, Masamatti VS, Uppin VM, Babaji P, Kumar LD, Kamble SS. Endodontic management of mandibular second molar with single root and canal. Univ Res J Dent 2014; 4: 123-5.

9) Roy A, Velmurugan N, Suresh N. Mandibular Second Molar with a Single Root and a Single Canal: Case Series. J Clin Dent Res 2013; 7(11): 2637-2638.