Case Report

International Journal of Dental and Health Sciences
Volume 02, Issue 04

ENDODONTIC MANAGEMENT OF COMPLEX ANATOMY ASSOCIATED WITH MANDIBULAR THIRD MOLAR PRESENTING FOUR ROOTS AND CANALS: A CASE REPORT

Vinaya R Kashid[1]
1.MDS,Conservative Dentistry and Endodontics

ABSTRACT:

Anatomic variations with third molars is a commonly occuring phenomenon. Four-rooted mandibular first molars and second molar have been observed on a few occasions in the literature, to the best of our knowledge, four-rooted third molars have been very rarely reported. Present case report is presented to illustrate the serendipitous discovery and successful non-surgical endodontic management of complicated canal systems in mandibular third molar.

Key Words: Root canal anatomy,mandibular third molar, four roots, four canals, endodontic treatment

INTRODUCTION:

The rationale of saving third molar as these teeth act as judicious abutment and fully functioning mandibular third molar in an arch that has adequate space for full eruption and oral hygiene. The anatomy of third molars has been described as unpredictable.[1]

The idea of endodontic treatment is shaping and cleaning of root canals and removal of necrotic tissues followed by obturation with an inert material to achieve hermetic seal. The main reasons for endodontic failure are apical percolation, incomplete canal obturation, and the presence of untreated canals [2].therefore sound knowledge of root and root canal morphology and morphological variations will help to reduce endodontic failure caused by incomplete debridement and obturation.

Since radiographic images only provide a two-dimensional evaluation of the teeth and the third di-mentioncannotbe exactly assessed with conventional radiographic techniques including shifting the X-ray beam, some anatomic characteristics of the teeth may not be diagnosed.[3,4] On the other hand, previous studies have shown that the root canal anatomy of all teeth including third molars is often extremely complex and highly variable.[5-7] These anatomic variations may be a result of ethnic background, age, and gender.[8-10]

CASE DETAIL:

A 38 year old female patient reported to the Department of Endodontics with pain

*Corresponding Author Address: Dr. Vinaya Ramkrishna Kashid. Email: vinayakashid233@gmail.com

with tooth # 38. She had a history of spontaneous pain which was referred to ear and also the tooth was tender to percussion.clinical examination showed deep occlusal caries. The patient had no systemic disorder.

Intraoral periapical radiograph revealed deep occlusal caries involving pulp and widening of periodontal ligament space. Also, as radiographic finding showed, a possible anatomic tooth variation was suspected.so endodontic treatment was planned.

After anesthesia with Lignox 2% A (Lignocaine 2% plus adrenaline 1:80000; Indico remedies ltd India), tooth was isolated with a rubber dam and an access cavity was prepared. Two mesial and one distal canal were found and with the extension of access cavity, one more distal canal was found which was buccally placed. As the size of buccal orifice was slightly larger, extension of orifice was carried out using a low speed round bur no 1(Dentsply maillefer Switzerland). By exploring the extended buccal orifice with a DG 16 explorer buccal canal was detected.

With the help of apex locator(Root zx mini) working length for each canal was determined using no 20 k file .all the four canals were prepared using rotary protaper next file system (Dentsplymaillefer Switzerland) upto size X2 in distobuccal and distolingual canals and X1 in mesiobuccal and mesiolingual canals with copious irrigation with 5.25% sodium hypochlorite and 17% EDTA.and final flush with normal saline.

The canals were dried with paper points and obturation was done with the corresponding pro taper cones using AH plus sealer.**(Figure 1 a – d)**

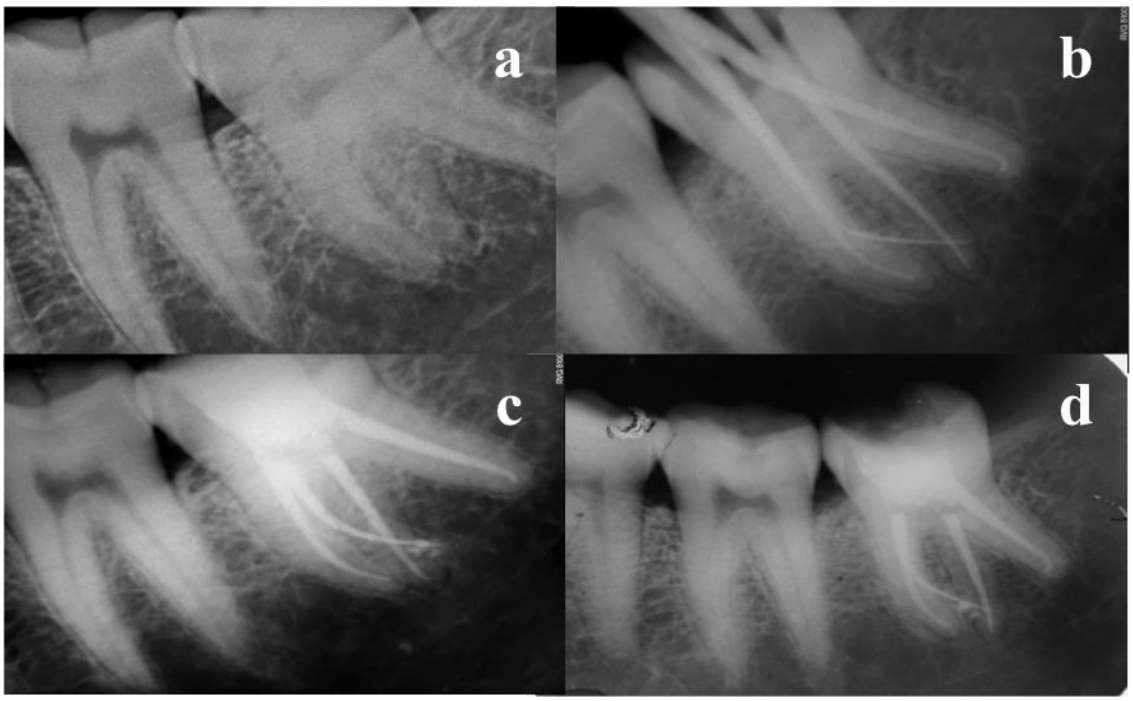

Figure 1 a – d a. Pre-operative RVG of tooth # 38. b. Mastercone RVG. c. Post Obturation RVG and d. Six-months follow up.

DISCUSSION:

Figure 2: Types I–VIII (from left to right) of Vertucci's classification for root canal anatomy of teeth.

Although four-rooted mandibular first molars and second molar have been observed on a few occasions in the literature.[11,12,13], to the best of our knowledge, four-rooted third molars have not been reported to date. Therefore, the four-rooted third molar observed in the present case seems to be a rare developmental anomaly of the molar root form.

According to Carlsen, [14] the primary elements of the rootcomplex are root cones and supernumerary radicular structures. For consistency with other publications,[15] we used the term "radical" rather than "cone" to refer to unseparated root-like divisions. When a root has two or more radicals, the individual root elements may be completely or incompletely divided. In completely separated roots, radicals are completely divided by an interradicular process at some point along the total length of a root, and the result is two or more separate roots. When radicals are incompletely divided owing to only minimal penetration of the interradicular processes, superficial development of grooves delimits the boundaries of the radicals. , [14] However, complete division of radicals is not common in mandibular molars.[14]Thus, the four-rooted third molar observed in this report suggests that there can be rare instances when root radicals are completely separated by the root bifurcation.

Therefore clinician should bear in mind the variations in the root and root canal number and morphology of the mandibular third molar.

CONCLUSION:

Success and failure of endodontic treatment depend on the thorough understanding of normal root canal anatomy and its variations. Not only the clinical examination but also radiographs with different angulations are necessary to rule out any variation in the anatomy. Tracing of periodontal ligament space also helps in diagnosing the presence of ancillary root.

REFERENCES:

1. Hargreaves KM, Cohen S. *Pathways of the Pulp*, 10th ed. Missouri: Mosby; 2011:215.
2. Ingle JI, Beveridge EE, Glick DH, Weichman JA. Modern endodontic therapy. In: Ingle JI, Beveridge EE, editors. Endodontics. 2nd ed. Philadelphia: Lea & Febiger; 1976. p. 1–57.
3. Olson AK, Goerig AC. The ability of radiograph to determine the location of the apical foramen. *Int Endod J* 1991;24:28-35.
4. Jafarzadeh H, Wu NY. The c-shaped root canal configura-tion: a review. *J Endod* 2007;33:517-23.
5. Rahimi S, Shahi S, Lotfi M, Zand V. Root canal configura-tion and the prevalence of C-shaped canals in mandibular second molars in an Iranian population. *J Oral Sci* 2008;50:9-13.
6. Walton R, Torabinejad M. *Principles and Practice of Endo-dontics*, 2nd ed. Philadelphia: W. B. Saunders; 1996:177-8.
7. Ash M, Nelson S. *Wheeler's Dental Anatomy, Physiology and Occlusion*, 8th ed. Philadelphia: WB. Saunders; 2003:125.
8. Wein FS, Hayami S. Canal configuration of the mesiobuccal root of the maxillary first molars of a Japanese sub-population. *Int Endod J* 1999;32:79-87.
9. Neaverth EJ, Kuttler LM. Clinical investigation (*in vivo*) of endodontically treated maxillary first molars. *J Endod* 1987;13:506-12.
10. Fogel H, Peikof MD. Canal configuration in the mesiobuccal root of the maxillary first molar: a clinical study. *J Endod* 1994;20:135-7.
11. Friedman S, Moshonou J, Staholz A. Five root canals in a mandibular first molar. Endod Dent Traumatol 1986;2:226–8.
12. Morita M. Morphological studies on the root of lower first molar in Japanese (in Japanese). Shika Gakuho (Dent Sci Rep) 1990;90:837–54.
13. Roshan P · Nilmini P Mandibular permanent second molar with four roots and root canals: Odontology (2009) 97:51–53.
14. Carlsen O. Dental morphology. 1st ed. Copenhagen: Munksgaard;1987.
15. Scott GR, Turner II CG. The anthropology of modern human teeth. Cambridge, UK: Cambridge University Press; 2000.