

Endodontic Management of Mandibular First Molar with Radix Entomolaris and Weine Type II Root Configuration: A Case Report

Bernard Iskandar^{1*}, Dwi Nugroho Juanda¹

1. Faculty of Dentistry Trisakti University, Jakarta, Indonesia.

Abstract

Variation of root canal anatomy is always a challenge for diagnosis and successful endodontic treatment. Knowledge of common anatomic characteristics and their possible variations is essential for the clinician. Radix entomolaris (RE) is one such aberration where an extra root is present on the distolingual aspect of the mandibular first molar. Also, the mesial canal has the variation of Weine type II, where mesiobuccal canal joint with mesiolingual with one foramen. This paper aims to present a case of a mandibular first molar with an additional distolingual root [radix entomolaris (RE)] and Weine type II on a mesial canal. In this case, opening access for entering the root canal in the RE required a modification of the opening in a distolingual direction. Glide path was made in all canal. Accept the mesial canal. After careful observation, this canal was joint with one foramen. With mesiolingual canal become the main canal. Final preparation at size 25 taper .06. After irrigation all canals were dried and obturated with warm vertical compaction technique. Radiographic was taken to confirm obturation.

Case report (J Int Dent Med Res 2020; 13(1): 355-358)

Keywords: Radix entomolaris, Weine type II, Endodontic treatment

Received date: 08 June 2019

Accept date: 27 July 2019

Introduction

Knowing variations from the root canal is very important and essential in endodontic treatment. Inadequate instrumentation, cleaning and irrigation of the root canal results in failure of endodontic treatment.¹

Supernumerary roots or canals occurs in all type of teeth, but canal configurations is much higher in premolars and molars. The number of roots in mandibular first permanent molars in various races differs significantly and often had variations and anomalies. In its usual form, the mandibular first permanent molars have two roots: mesial and distal roots. However, one variety of the mandibular first permanent molars is to have an additional third root. If this extra root is located mesiobuccally, it is called radix paramolaris (RP), and additional root at distolingually, it is called radix entomolaris (RE)

In previous studies, in the European population, RE was reported in mandibular first permanent molars with a maximum frequency of

3.4-4.2%.^{2,3} But in Mongoloid populations traits, such as Chinese, Inuit, and Indian American. The occurrence of RE is 5% to more than 40%.^{4,5} It is considered to be a normal morphological variant in these population and can be seen as an Asiatic trait. Radix paramolaris is very rare and occurs with a prevalence of <0.5%.⁶

Regardless of the prevalence of RE has a racial bias. Optimal identification of RE and RP, instrumentation, cleaning and irrigation is essential to achieving successful endodontic treatment. In this article will discuss the clinical approach from diagnosis to treatment of first permanent molars with Radix entomolaris Weine type II classification.

Case Report

A 56-year-old man was came to our clinic for endodontic/restorative treatment of right mandibular first permanent molars. The medical history was non-contributory. Clinical examination of tooth 46 showed a substantial occlusal composite restoration. The chief complains on tooth 46 was pain and swelling. On palpation test, there was a swelling on the buccal area on tooth 46 with mobility in normal limit. Percussion test was positive with mild pain, and

*Corresponding author:

Bernard Iskandar
Faculty of Dentistry Trisakti University, Jakarta, Indonesia.
Email: endo_bernard@yahoo.com

at the periapical X-ray, there was a calcification at pulp chamber, with radiolucency on the apex of distal root tooth 46.



Figure 1. Tooth 46 with swelling on the buccal side.

After isolation using a dental dam, the extensive composite restoration was mainly removed using round bur and access opening using endo access bur, and using an ultrasonic device to locate orifice of the canal. The trapezoidal opening cavity was performed. Four orifices were found (MV, ML, DV and DL). The location of DL orifice was more to the lingual site, an extraordinary location and defying the symmetrical law.



Figure 2. The access opening tooth 46.

Canal exploration and secure glide path with #8 K-file. The length of these canals was measured using apex locator and confirmed the working length using radiograph. In periapical

radiograph, showed that lingual root was separated, this indicates this canal morphology as RE.



Figure 3. RE canal exploration on tooth 46.

After working length and glide path have determined, canals were prepared using RECIPROC Blue File (VDW, Munich, Germany) with reciprocating movement and finished at file R25 taper .06. Irrigation protocol during canal preparation using sodium hypochlorite solution (5,25%) and activated with EDDY Sonic Tip (VDW, Munich, Germany)

During the preparation of the mesial root canal. We find that those canal confluence. To confirm it, gutta-percha point inserted in on the mesiobuccal canal and #8 K-file on the mesiolingual canal. Indentation on the gutta-percha point indicates this is Weine type II mesial root canal. (Figure 4.)



Figure 4. Periapical radiograph shows Weine type II configuration on mesial root.

After all canal preparation was done, all canals were filled using Ca(OH)_2 for one week. After one week, the patient was recalled, from clinical observation, all the symptoms and the swelling nearby tooth 46 were gone.

Before obturation, all canal were irrigated using sodium hypochlorite solution (5,25%) and activated with EDDY Sonic Tip (VDW, Munich, Germany), then EDTA was used to remove the smear layer and activated with sonic tip, and one last rinse using sodium hypochlorite solution (5,25%), and dried with a paper point. All canals were obturated with warm vertical compaction using the corresponding GP and resin base sealer.



Figure 5. Obturations radiograph.

Discussion

Variations from the mandibular first permanent molars, starting from the extra root and extra canal. Often making it difficult for the operator to be able to determine the root canal in endodontic treatment, that can lead to inadequate cleaning and shaping, which fails endodontic treatment to be performed.⁷

De Moor, et al. has classified RE into three groups by the root/canal curve.⁸ Type I refers to a straight root canal, Type 2 refers to an initially curved entrance that continues as a

straight canal and Type III refers to an initially lingual curve in the coronal third of the root canal and a second buccal orientated curve beginning in the middle and continuing to the apical third. Type III is found more frequently than the other anatomical types.⁹ In this case, the tooth 46 was classified as De Moor's type 3 classification with Weine's type 2 classification.

All of these findings require good cleaning and shaping. Successful outcomes of endodontic treatment depend on the ability of the operator in canal exploring, assessment at the interpretation of the radiograph, getting straight access, and adequate shaping and irrigation. Usage of sonic activation (EDDY) in this case was also essential. EDDY capability to remove smear layer was significantly superior compared with manual irrigation.¹⁰ Canal preparation with taper .06 prevents ledge, zips, and root perforation.¹¹ When compared, rotary instruments with tapered more than .04 provide results that are more efficient than hand instruments.¹² Influence of the root canal taper on its clearness: a scanning electron microscopic study and allow to adequate obturation.

Conclusions

The Radix entomolaris is an odd, and unique anatomic variation in mandibular first molar. Clinicians knowledge and expertise are essential in this case. Identification RE that locates distolingually, cleaning, shaping and irrigation is necessary to avoid reinfection of the canal and to achieve successful endodontic treatment.

Declaration of Interest

The authors report no conflict of interest and the article is not funded or supported by any research grant.

References

1. Segura-Egea JJ, Jiménez-Pinzón A, Ríos-Santos J V. Endodontic therapy in a 3-rooted mandibular first molar: importance of a thorough radiographic examination. *J Can Dent Assoc.* 2002;68(9):541-4
2. Ferraz JA, Pécora JD. Three-rooted mandibular molars in patients of Mongolian, Caucasian and Negro origin. *Braz Dent J.* 1993; 3(2):113-7
3. Ahmed HA, Abu-Bakr NH, Yahia NA, Ibrahim YE. Root and canal morphology of permanent mandibular molars in a Sudanese population. *Int Endod J.* 2007; 40(10):766-71

4. Turner CG. Three-rooted mandibular first permanent molars and the question of American Indian Origins. *Am J Phys Anthropol.* 1971; 34(2):229-41
5. Steelman R. Incidence of an accessory distal root on mandibular first permanent molars in Hispanic children. *ASDC J Dent Child.* 1986; 53(2):122-3
6. Carlsen O, Alexandersen V. Radix mesiolingualis and radix distolingualis in a collection of permanent maxillary molars. *Acta Odontol Scand.* 2000; 58(5):229-36
7. S Cohen RCB (Eds. . Orofacial dental pain emergencies: endodontic diagnoses and management. In: *Pathways of the pulp* (8th ed). 2002. p. 31–75.
8. De Moor RJG, Deroose CAJG, Calberson FLG. The radix entomolaris in mandibular first molars: An endodontic challenge. *International Endodontic Journal.* 2004; 37(11):789-99
9. Wang Q, Yu G, Zhou XD, Peters OA, Zheng QH, Huang DM. Evaluation of X-ray projection angulation for successful radix entomolaris diagnosis in mandibular first molars in vitro. *J Endod.* 2011; 37(8):1063-8
10. Urban K, Donnermeyer D, Schäfer E, Bürklein S. Canal cleanliness using different irrigation activation systems: a SEM evaluation. *Clin Oral Investig.* 2017; 21(9):2681-2687
11. Arvaniti IS, Khabbaz MG. Influence of root canal taper on its cleanliness: A scanning electron microscopic study. *J Endod.* 2011; 37(6):871-4
12. Stavileci M, Hoxha V, Görduysus MÖ, Laperre K, Tatar I, Hoxha R. Effect of endodontic instrumentation technique on root canal geometry. *J Int Dent Med Res.* 2017;10(3):952–7.