

CASE REPORT

The Radix paramolaris: Clinical approach to a rare case of root aberrancy

Rupankar Dey¹, Laboni Ghorai²; Paromita Mazumder³; Saikat Chatterjee⁴

^{1,4}Postgraduate Student, ³Professor & Head of Department, Department of Conservative Dentistry and Endodontics, Guru Nanak Institute of Dental Sciences and Research, Kolkata, India,

²MDS, Senior Consultant, Oral Medicine and Radiology, Avinash Dental Laboratories and Research Institute Pvt. Ltd, Kolkata, India

ABSTRACT:

Permanent mandibular first molars usually have two roots with three root canals. However, the number of roots and canals may vary. The variation in the number of roots is called Radix. The presence of an additional third root or a supernumerary root located distolingually is known as Radix entomolaris and if present buccally, it is called Radix paramolaris. The occurrence of Radix paramolaris is less frequent compared to Radix entomolaris and is considered rare in Indian population. Awareness and understanding of this aberrant third root and its canal morphology can minimize the chances of a missed canal which in turn will contribute to the successful outcome of root canal treatment. This article reports successful endodontic treatment of a rare case of permanent mandibular first molar with Radix paramolaris in Indian population.

Key words: Aberrant third root, Endodontic treatment, Permanent mandibular first molar, Radix entomolaris, Radix paramolaris

Received: 14 February, 2019

Revised: 28 February, 2019

Accepted: 3 March, 2019

Corresponding author: Dr. Rupankar Dey, Postgraduate Student, Department of Conservative Dentistry and Endodontics, Guru Nanak Institute of Dental Sciences and Research, Kolkata, India

This article may be cited as: Dey R, Ghorai L, Mazumder P, Chatterjee S. The Radix paramolaris: Clinical approach to a rare case of root aberrancy. Int J Res Health Allied Sci 2019; 5(2):4-6.

INTRODUCTION

The success of root canal treatment depends on eradication of endodontic pathology through a thorough chemo-mechanical preparation of the canal system before a tri-dimensional root canal filling with a hermetic seal. Therefore, the clinicians should have an integral knowledge of the root canal anatomy as well as its variations [1]. Anatomical variations in terms of an accessory canal or a supernumerary root may contribute to endodontic failure because of a "missed" canal or incomplete root canal preparation and obturation [2]. In this respect, mandibular first molars have a significantly lower success rate compared with other teeth, according to Swartz, Skidmore and Griffen [3]. Permanent mandibular first molars are usually two-rooted with two mesial and one distal canal. But, variations in the number of roots and in canal morphology are not uncommon. However, a survey by Tratman (1938) has reported the prevalence of three rooted mandibular molar to be only 0.2% [4]. The presence of this additional third root on the distolingual side of mandibular molar is

known as Radix entomolaris (RE) and that on the mesiobuccal side is known as Radix paramolaris (RP), the occurrence of which is less frequent than Radix entomolaris in Indian population [5].

This article highlights a rare case report which illustrates about the radiographic identification and endodontic management of permanent mandibular first molar with Radix paramolaris in Indian population.

CASE REPORT

A 30 years old female patient was referred to the Department of Conservative Dentistry and Endodontics with a chief complaint of pain in the right lower back tooth region since 2 days. The pain was sudden in onset, severe in intensity, intermittent and non-radiating in nature, which aggravated on chewing food. The patient reported a history of similar episodes of pain 3 months back, which had subsided with medications. Her medical history was non-contributory. Intraoral examination revealed a deep carious lesion on the occlusal aspect of the crown of tooth 46 and the tooth was tender on vertical

percussion. Electric pulp test was negative irt 46. Intraoral periapical radiographic examination [Figure 1] revealed an ill-defined coronal radiolucency approaching the pulp and periapically there was an ill-defined radiolucency irt both mesial and distal roots of 46. Further, on close inspection of the radiograph, there appeared to be an additional root on the mesiobuccal aspect of 46. Another radiograph was taken with SLOB technique which suggested of RP. Based on the clinical and radiographic findings, the tooth was diagnosed with phoenix abscess and hence, endodontic management was planned.

In the first visit, local anaesthesia was administered using 2% lidocaine (LOX 2%, Neon Laboratories Ltd. Mumbai, India) for inferior alveolar nerve block and the tooth was isolated under rubber dam. Access preparation was done with an endo access bur no.1 (Dentsply, Maillefer, Ballaigues, Switzerland) and the canal orifices were located. Coronal enlargement of the canals were performed with the nickel-titanium ProTaper orifice shaper (Dentsply, Maillefer). The canals were then negotiated with K-file ISO 10 (Mani, Japan) to create initial glide path and length determination was done with

an electronic apex locator (Canal Pro, ColteneWhaledent) and confirmed radiographically [Figure 2]. Root canal instrumentation was performed with ProTaper Gold Ni-Ti rotary files (Dentsply, Maillefer) in a crown-down technique upto F2 size for the mesial and distal canals, using Glyde (10% carbamide peroxide & 15% EDTA, Dentsply, Maillefer) as lubricant. After each instrumentation, the root canals were adequately irrigated with 2.5% sodium hypochlorite solution. Final irrigation was done using 2% chlorhexidine (RC-Chlor, Deor, Azure laboratories, Kochi, India). Calcium hydroxide intracanal medicament was placed and access cavity was restored with zinc oxide eugenol cement. In the follow-up visit after one week, when the tooth was asymptomatic, master cone radiograph [Figure 3] was taken. The canals were dried using paper points and obturated with corresponding ProTaper gutta-percha points (Dentsply, Maillefer) using AH plus resin sealer (Dentsply, Maillefer). A postoperative intraoral periapical radiograph [Figure 4] was taken and subsequently the access cavity was sealed with permanent coronal composite resin restoration.

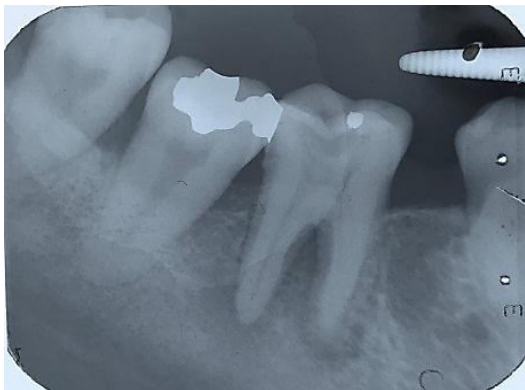


Figure 1: Preoperative IOPA



Figure 2: Working length determination



Figure 3: IOPA of mater cone



Figure 4: Post Obturation IOPA

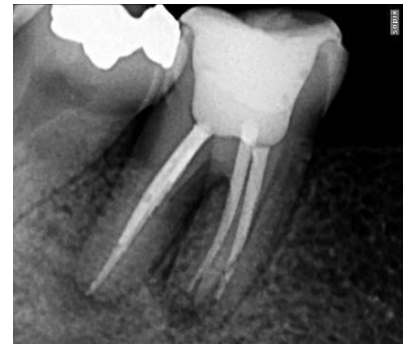


Figure 5: IOPA after access cavity restoration

Prevalence: Bolk reported the occurrence of radix paramolaris. Radix paramolaris is very rare and occurs less frequently than radix entomolaris [5]. Visser reported the prevalence of radix paramolaris to be 0% for mandibular first molars, 0.5% for second molars and 2% for third molars [6].

Aetiology: The exact cause of such variation is still not known. Authors say that it may be due to disturbance during odontogenesis or may be due to an atavistic gene [7].

Classification: Carlsen & Alexandersen (1991) classified radix paramolaris (RP) into two different types [8]:

1. Type A: cervical part is located on the mesial root complex.
2. Type B: cervical part is located centrally, between the mesial and distal root complexes.

Morphology: The radix paramolaris (RP) is located mesiobuccally. The dimensions of RP may vary from short conical extension to a mature root which can be separate or fuse [8].

Clinical Implications: The presence of radix has clinical implications in root canal treatment. Accurate clinical and radiographic diagnosis can avoid failure of root canal treatment because of missed canal. To achieve a correct diagnosis, a minimum of two diagnostic radiographs are necessary using buccal object rule (30°) [7]. Even the presence of an extra cusp may sometimes indicate presence of additional root and canals [9]. Following Access preparation, advanced diagnostic aids may help in the better identification and visualization of all the canals [7].

Complications: The common complications encountered during the endodontic treatment include difficulty in radiographic interpretation, problems with canal localisation, modification in access cavity preparation, confusion in working length determination and iatrogenic errors committed by clinicians such as straightening of a

root canal resulting in loss of working length, ledge formation, zipping, canal transportation or even perforation [10].

CONCLUSION

“The eyes see only what the mind is prepared to comprehend”- Robertson Davies.

The root canal anatomy is complex and variations can occur, which tend to pose as a challenge to the clinicians. Hence, thorough knowledge of root morphology and awareness of these variations make the endodontic treatment more successful and if one exhibits proper skill, these variations can be handled with ease.

REFERENCES

1. Davini, F., Cunha, RS., Fontana, CE., Silveira, CF. and Bueno, CE. 2012. Radix entomolaris – A case report. RSBO, 9(3): 340-344.
2. Segura-Egea, JJ., Jimenez-Pinzon, A. and Rios-Santos, JV. 2002. Endodontic therapy in a 3-rooted mandibular first molar: Importance of a thorough radiographic examination. J Can. Dent. Assoc., 68(9): 541-544.
3. Swartz, DB., Skidmore, A. and Griffin, J. 1983. Twenty years of endodontic success and failure. J Endod., 9(5):198-202.
4. Tratman, EK. Three-rooted lower molars in man and their racial distribution. 1938. Br. Dent. J, 64:264-274.
5. Bolk L (1914) Welcher Gebirgsgehörten die Molaren an? Z Morphol Anthropol 17: 83-116.
6. Visser JB (1948) Beitrag zur Kenntnis der menschlichen Zahnwurzelformen. Hilversum: Rotting. 49-72.
7. Calberson FL, De Moor RJ, Deroose CA. The radix entomolaris and paramolaris: Clinical approach in endodontics. J Endod 2007;33:58-63.
8. Carlsen O, Alexandersen V (1991) Radix paramolaris in permanent mandibular molars: identification and morphology. Scand J Dent Res 99:189-195.
9. Brabant H, Klees L, Werelds RJ. Anomalies, Mutilations et Tumeurs des Dents Humaines. Paris. France: Editions Julien Prelat; 1958.
10. Bolla, N., Naik, BD., Kavuri, SR. and Sriram, SK. 2010. Radix Entomolaris: A Case Report. J Orofac. Sci., 2(1): 43-45.