



Case Report

Endodontic management of radix entomolaris : Case reports

Nileena Mary Cherian^{1,*}, Deep Shah¹, KC Ponnappa², TN Girish³, MC Ponappa³¹Post graduate student, Department of Conservative Dentistry and Endodontics, Coorg Institute of Dental Sciences, Virajpet, Karnataka²Professor & HOD, Department of Conservative Dentistry and Endodontics, Coorg Institute of Dental Sciences, Virajpet, Karnataka, India³Professor, Department of Conservative Dentistry and Endodontics, Coorg Institute of Dental Sciences, Virajpet, Karnataka, India

ARTICLE INFO

Article history:

Received 30-05-2020

Accepted 28-06-2020

Published 31-08-2020

* Corresponding author.

Nileena Mary Cherian

nileenacherian@gmail.com

[https://doi.org/](https://doi.org/10.38138/JMDR/v6i1.1)

10.38138/JMDR/v6i1.1

ABSTRACT

The clinician's knowledge and familiarity with the root canal anatomy plays a crucial role in the identification of variations in the anatomy like extra canals and roots. Inability to recognize and negotiate these variants lead to failures. The mandibular first molar is reported to be involved in root canal procedure more often, as it is one of the initial permanent posterior teeth to erupt. This tooth type exhibit reasonable variations in the number of canals and roots. One such variation is an extra root in the lingual termed the Radix Entomolaris. This article is a report of two cases describing the management of the first mandibular molars with Radix Entomolaris.

Keywords: Radix Entomolaris; Extra root; Anatomical variation; Mandibular molar; Endodontic treatment; Root canal treatment

1 INTRODUCTION

The optimal requirements for the success of root canal therapy are meticulous cleaning and shaping followed by proper filling and sealing of the root canal system⁽¹⁾. The clinician's knowledge and familiarity with the variations in root canal anatomy plays a crucial role in its identification and management. Inability to recognize and negotiate these variants lead to failures.

The mandibular first molar is reported to be involved in root canal procedure more often, as it is one of the initial permanent posterior teeth to erupt. This tooth type exhibit reasonable variations in the number of canals and roots.

The presence of an additional third root in the mandibular molar; a supernumerary root which can be found lingually or mesiobuccally, are termed Radix Entomolaris and Radix Paramolaris respectively⁽²⁾.

Radix Entomolaris was first mentioned in the literature by Carabelli in 1844.

Various literature suggests that this supernumerary root can be distinct or partly fused to other roots. It is generally smaller, with variable curvature and requires additional consideration in its management⁽¹⁾. Various studies have reported the prevalence of Radix Entomolaris in the Asian population ranging from 5.8% to more than 30%. According to Wang et al. preoperative radiographs in different horizontal angulations were adequate for the detection of multi-rooted teeth⁽³⁾. Proper diagnosis and management of these variations will lead to the long-term survival of teeth^(4,5).

CASE REPORT 1

An 18-year-old female reported to the Department of Conservative Dentistry and Endodontics with a complaint of pain in the right and left side of the jaw. On clinical examination deep occlusal caries were noticed in the right and left mandibular first molars (Tooth no: 36 and 46). The teeth were tender to percussion.

On radiographic examination radiolucency involving the pulp with periapical changes were noted in 36 and 46. Radiograph also revealed a radiopaque line around the root, suggesting the presence of an additional root. An additional radiograph in a different angulation was taken to confirm the presence of an additional root. Pulp sensibility tests were performed (Cold test and EPT) which showed negative results. A diagnosis of pulp necrosis with apical periodontitis was made. The patient was advised to undergo root canal treatment followed by prosthetic rehabilitation with respect to both 36 and 46.

Access cavity preparation was performed in 36 and closer inspection of the pulpal floor confirmed the presence of two mesial and two distal canal orifices. The location of orifices was reconfirmed using an endodontic explorer [DG16, Hu-Friedy, Chicago]. Canals were negotiated using #08 and #10 size K-files [Dentsply Maillefer, Ballaigues, Switzerland]. The working length of the canals were determined using an electronic apex locator [Propex, Dentsply Maillefer] and later confirmed radiographically. Pulp space preparation was done using rotary Ni-Ti files [ProTaper, Dentsply-Maillefer] along with copious irrigation, using 2.5% sodium hypochlorite solution and 17% EDTA solution. Calcium hydroxide was used as intracanal medicament for canal disinfection. In the following visit, gutta-percha master cones [ProTaper, Dentsply Maillefer] were selected and obturation was completed.

Similar procedures were done with respect to 46 also. ([Figures 1 and 2](#))

Later 36 and 46 were reinforced with a PFM overlay and a PFM crown respectively.

CASE REPORT 2

A 20-year old male patient reported with a chief complaint of pain in the left lower back tooth region. On clinical examination deep caries was noted with respect to the left lower first molar (Tooth no: 36) and was tender on percussion.

On radiographic examination, radiolucency involving the pulp and PDL space widening around the root were noted. Radiograph also revealed a radiopaque line around the root, suggesting the presence of an additional root. An additional radiograph in a different angulation was taken to confirm the presence of an additional root.

Pulp sensibility test were performed (Cold test and EPT), delayed response was noted. A diagnosis of chronic irreversible pulpitis was made.

The patient was advised to undergo root canal treatment followed by post endodontic restoration in relation to 36.

Similar protocols as in Case I was followed for location of orifices, cleaning and shaping and obturation. ([Figure 3](#))

2 DISCUSSION

Proper diagnosis, dentist's knowledge of the root canal system and the clinical approach utilized, lead to the success of the treatment. An accurate diagnosis of Radix can avoid procedural complications like a missed canal which is a common reason for endodontic failure.

The definite cause of RE still remains obscure. The hypothesized causes for the occurrence of dysmorphic, supernumerary roots are due to disturbances during development or due to the penetrance of polygenetic system or an atavistic gene. Expression of certain racial genetic factors have a pronounced effect in the presence of eumorphic roots⁽⁶⁾.

Detection of Radix can be confirmed by correlating the findings of clinical examination, imaging techniques and other accessories⁽⁷⁾. Thus, in the present case report critical clinical evaluation followed by multiple radiographs in different angulation helped to confirm the presence of extra root. Saurabh et al. confirmed the prevalence of RE in the South Indian population to be 13.3%⁽¹⁾ and another study by Alpa et al showed the prevalence of RE in the North Indian population to be 13%⁽⁸⁾. Studies by Steelman R and Yew SC et al showed the bilateral prevalence of Radix Entomolaris in the range of 50-67%. In the present first case report, the bilateral presence of Radix Entomolaris was observed.

Thus, the clinician has to be vigilant in diagnosing these variations. Factors such as an extra cusp, cervical convexity, prominent distolingual lobe, complex external contour of the furcation can indicate the presence of a RE aside from the clinical understanding about the possible existence and the racial prevalence of Radix⁽⁷⁾. Careful inspection of the radiographs, can aid in locating "hidden" extra root in mandibular first molar which may be obscure due to the overlapping of the distal root. However, it may still be missed due to its thin proportions⁽⁹⁾. When in doubt, CBCT can help diagnose the presence of Radix.

After diagnosis, access cavity preparation plays a critical role in the location of the canal orifices.

Modification of access cavity preparation from triangular to trapezoidal can ease the location of distolingually placed orifice. Magnification aids and ultrasonic tips are useful in locating and treating Radix. Certain amount of curvature may be present in these cases. Therefore, establishing a glide path before preparation in conjunction with radiographic root canal length and curvature determination helps to prevent procedural errors⁽⁶⁾.

Considering the Radix paramolaris (RP), it is mostly associated with the presence of an additional cusp (tuberculum paramolare) buccally. Prominence in the cervical part of the tooth can also point to RP. In cases of RP, trapezoidal access cavity preparation extending mesially is a requisite. The orifice of the RP can be revealed after the removal of the dentinal shelf mesiobuccally⁽¹⁰⁾.



Fig. 1: Intraoral photograph's showing location of canal of 36 and 46

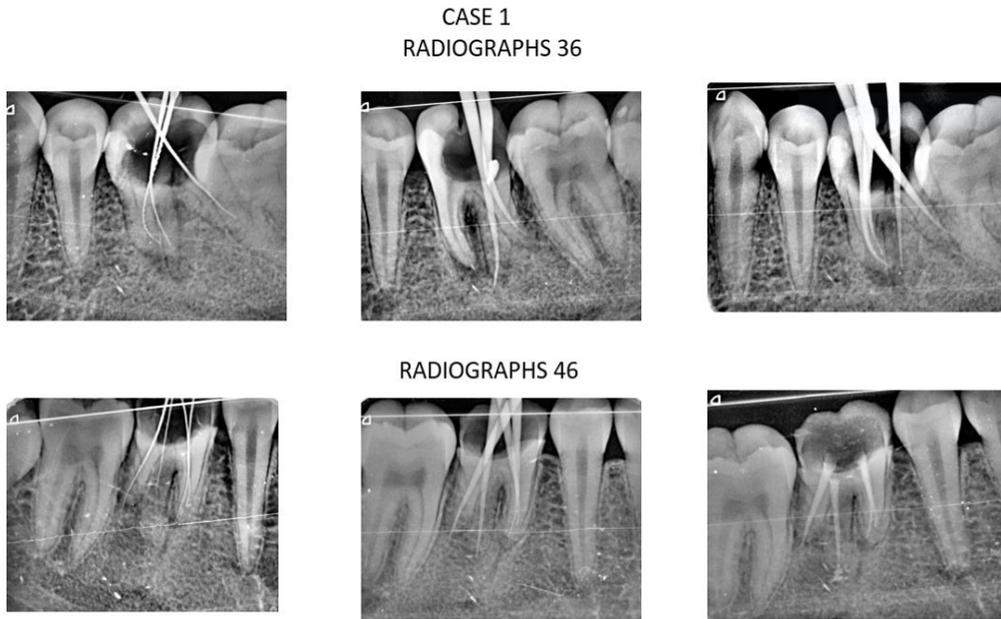


Fig. 2: (A) Radiographs of case 1 - tooth number 36 (B) Radiographs of case 2 - tooth number 46

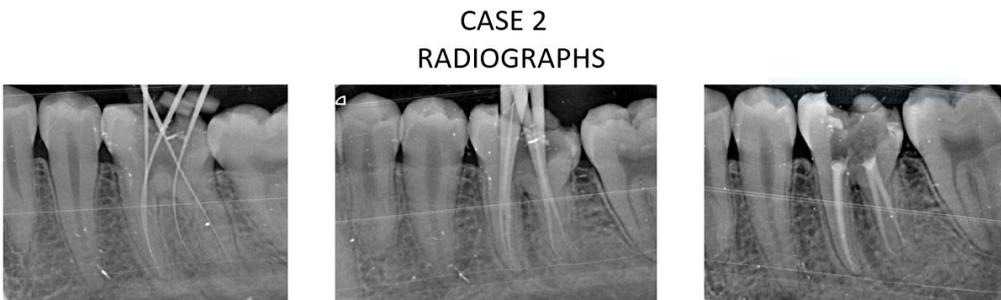


Fig. 3: Case -2, radiographs of tooth number 36

Therefore, the probability for the presence of an additional root should be considered and examined carefully.

Diligent diagnosis, management and proper post endodontic rehabilitation procedures will lead to the clinical success of such variables.

3 CONCLUSION

Alterations in the dental anatomy can be challenging to the dentist. Improper diagnosis, inappropriate clinical aids and lack of clinical expertise can lead to the failure of such cases. Thus, initial diagnosis, proper management and rehabilitation of the tooth with presence of extra root, will lead to the long-term success of tooth.

4 SUMMARY

Radix entomolaris has been reported to occur in a frequency ranging from 0.2% to 32% in various population. The management of a Radix Entomolaris require thorough clinical knowledge, proper diagnostic tools and endodontic skills. In this article, two case reports of Radix Entomolaris has been discussed. The first case report showed bilateral presence of Radix Entomolaris with respect to 36 and 46, whereas the second case showed a unilateral presence with respect to 36. After making a proper diagnosis, modified trapezoidal access cavity preparation was done in order to better locate and access the distolingually located orifice of the additional root. Canals were negotiated using #08 and #10 size K-files. Cleaning and shaping were done using rotary NiTi files after determining the working length. Obturation was done using single cone technique, followed by post endodontic restoration.

Improper diagnosis, inappropriate clinical aids and lack of clinical expertise can lead to the failure of such cases. Thus,

initial diagnosis, proper management and rehabilitation of the tooth with presence of extra root, will lead to the long-term success of tooth.

REFERENCES

- 1) Chandra SS, Chandra S, Shankar P, Indira R. Prevalence of radix entomolaris in mandibular permanent first molars: a study in a South Indian population. *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology*. 2011;112:e77–e82. Available from: <https://dx.doi.org/10.1016/j.tripleo.2011.02.016>.
- 2) Moor RJGD, Deroose CAJG, Calberson FLG. The radix entomolaris in mandibular first molars: an endodontic challenge. *International Endodontic Journal*. 2004;37(11):789–799. Available from: <https://dx.doi.org/10.1111/j.1365-2591.2004.00870.x>.
- 3) Wang Q, Yu G, Zhou X, Peters OA, Zheng Q, Huang D. Evaluation of X-Ray Projection Angulation for Successful Radix Entomolaris Diagnosis in Mandibular First Molars In Vitro. *Journal of Endodontics*. 2011;37(8):1063–1071.
- 4) Thomas BJ, Nishad A, Paulaian B, Sam JE. Case reports and clinical guidelines for managing radix entomolaris. *Journal of Pharmacy and Bioallied Sciences*. 2016;8:160–163.
- 5) Gupta S, Raisingani D. The Radix Entomolaris and Paramolaris: A Case Report. *Journal of International Oral Health*. 2011;p. 1–7.
- 6) Calberson FL, Moor RJD, Deroose CA. The Radix Entomolaris and Paramolaris: Clinical Approach in Endodontics. *Journal of Endodontics*. 2007;33(1):58–63. Available from: <https://dx.doi.org/10.1016/j.joen.2006.05.007>.
- 7) Pai ARV, Colaco A, Jain R. Detection and endodontic management of radix entomolaris: Report of case series. *Saudi Endodontic Journal*. 2014;4(2):77–82. Available from: <https://dx.doi.org/10.4103/1658-5984.132723>.
- 8) Duhan J, Gupta A, Wadhwa J. Prevalence of three rooted permanent mandibular first molars in Haryana (North Indian) population. *Contemporary Clinical Dentistry*. 2017;8:38–41. Available from: https://dx.doi.org/10.4103/ccd.ccd_699_16.
- 9) Attam K, Nawal RR, Utneja S, Talwar S. Radix Entomolaris in Mandibular First Molars in Indian Population: A Review and Case Reports. *Case Reports in Dentistry*. 2012;2012:1–7. Available from: <https://dx.doi.org/10.1155/2012/595494>.
- 10) Mastoras K, Ioannidis K, Beltes P. Presence and clinical significance of radix entomolaris and radix paramolaris. *Balkan Journal of Stomatology*. 2010;14(1):16–22.