

**Management of mandibular first molar with Radix Entomolaris: 2 Case Reports**Dr. Sonia Preshma D'souza<sup>1\*</sup>, Prof. Dr. Shishir Shetty<sup>2</sup>, Prof. Dr. Mithra N.Hegde<sup>3</sup><sup>1</sup>PG student, Department of Conservative Dentistry and Endodontics, A.B.Shetty Memorial Institute of Dental Sciences, Mangaluru, Karnataka, India<sup>2</sup>Professor, Department of Conservative Dentistry and Endodontics, A.B.Shetty Memorial Institute of Dental Sciences, Mangaluru, Karnataka, India<sup>3</sup>Vice principal, Head of the Department, Department of Conservative Dentistry and Endodontics, A.B.Shetty Memorial Institute of Dental Sciences, Mangaluru, Karnataka, India**Case Report****\*Corresponding author**Dr. Sonia Preshma  
D'souza**Article History**

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**Abstract:** The success of endodontic treatment depends on the eradication of microbes from the root-canal system and prevention of re-infection. Clinicians should have awareness and understanding of the unusual root and its root canal morphology. This case report describes successful endodontic treatment of two mandibular first molar with radix entomolaris. Identification of this variation was done through clinical examination along with the aid of multiangled radiographs.**Keywords:** Root canal treatment, Anatomical variations, radix entomolaris, extra root.**INTRODUCTION**

The success of endodontic treatment depends on the eradication of microbes from the root-canal system and prevention of re-infection [1]. The awareness of roots and their anatomy is essential for accurate diagnosis and to prevent errors or mishaps.

Mandibular first molar displays significant anatomical variations in the number of roots, root canals and morphology. The most common variation in the mandibular first molar is the presence of supernumerary root. If the supernumerary root is located distolingually to the mandibular molars it is called Radix entomolaris. It was first mentioned in the literature by Carabelli in 1844[2].

If a supernumerary root is on the mesiobuccal side it is called radix paramolaris.

**CLASSIFICATION**Carlsen & Alexandersen<sup>3</sup> classified radix entomolaris (RE) into four different types based on the location of its cervical part;

TYPE A: The RE is located lingually to the distal root complex which has two cone-shaped macrostructures.

TYPE B: The RE is located lingually to the distal root complex which has one cone-shaped macrostructures.

TYPE C: The RE is located lingually to the mesial root complex.

TYPE AC: The RE is located lingually between the mesial and distal root complexes

De Moor *et al.*, classified radix entomolaris based on the curvature of the root or root canal:

TYPE 1: A straight root or root canal

TYPE 2: A curved coronal third which becomes straighter in the middle and apical third

TYPE 3: An initial curve in the coronal third with a second buccally oriented curve which begins in the middle or apical third

Song JS *et al.*, 2010 [4] added two more variants

Small type: Length shorter than half of the length of the distobuccal root

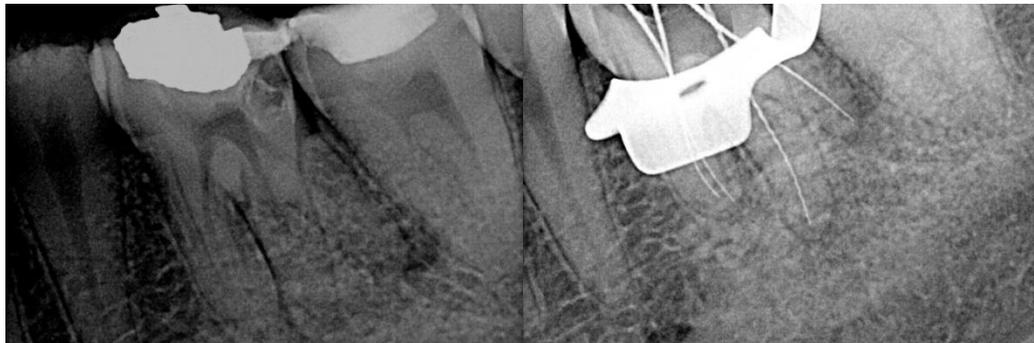
Conical type: Smaller than the small type and having no root canal within it.

**CASE REPORT 1**

A 24 year female patient visited to department of conservative dentistry and endodontics A.B.Shetty memorial institute of dental sciences Mangaluru, for endodontic treatment of the permanent right mandibular molar. The tooth was symptomatic (Irreversible pulpitis). Radiographic examination showed radiolucency and widening of periodontal ligament wrt 46. The radiograph was taken at horizontal angulation - 20 degree mesial angulation using bisecting angle technique which confirmed the presence of an extra root. The pulp chamber was deroofed with endo access burs and the canals were located with DG 16

Endodontic Explorer (Dentsply United Kingdom) and explored with a No 10K file (Dentsply Maillefer, Ballaigues, Switzerland). Initially working length was triangular with location of three canal orifices later modified to trapezoidal. The access was refined using endo Z bur (Dentsply Maillefer, Ballaigues, Switzerland).The working length was measured using apex locator (Apex ID) .The root canals were shaped

with ProTaper rotary universal instruments (Dentsply Maillefer).5.25 % Sodium hypochlorite and 17%EDTA was used for disinfection followed by 2 % chlorhexidine irrigation. The root canals were filled with gutta-percha and AH plus sealer. The pulp chamber was sealed with Fuji IX (GC Corp., Tokyo, Japan) glass ionomer cement.



**A) Preoperative radiograph**

**B) working length radiograph**



**C) Master cone radiograph**



**D) Post-operative radiograph**



**E) Access cavity preparation**

**Fig-1:**

### **CASE REPORT 2**

A 20 year female patient visited the department of Conservative dentistry and endodontics A.B.Shetty memorial institute of dental sciences, Mangaluru complaining of pain in permanent left mandibular molar. Pain was moderate and intermittent in nature. Clinical examination revealed a deep carious lesion in the left permanent first mandibular molar. Radiograph reveals a carious lesion encroaching the pulp space and also indistinct root canal outline in

the distal root. Two radiographs with different horizontal angulations were recorded which showed the presence of an additional lingual root.

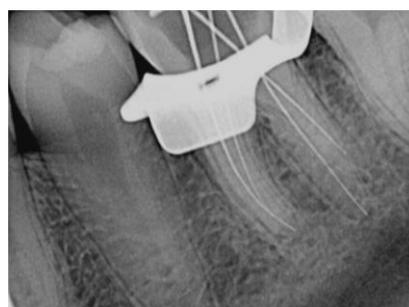
Tooth was symptomatic and diagnosis of irreversible pulpitis wrt 36 was made. Access opening was done following local anaesthesia and rubber dam placement. Four distinct canal orifices were located and root canals were negotiation with a K-file ISO 10. The lengths of these canals were measured electronically.

The canals were cleaned with sodium hypochlorite solution (5.25%) and EDTA and shaped with proTaper instruments. All canals were filled with gutta-percha

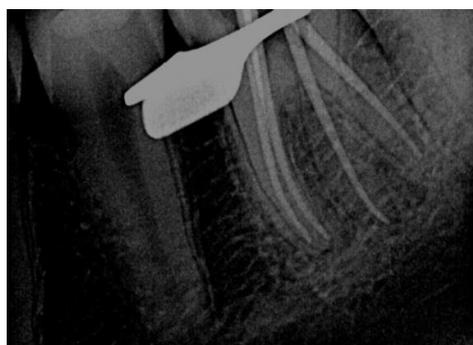
and AH plus sealer and the cavity was sealed with Fuji IX (GC Corp, Tokyo, Japan).



A) Preoperative radiograph



B) working length radiograph



C) Master cone radiograph



D) Post operative radiograph

Fig-2

## DISCUSSION

Variations in the root configuration can impose problems during endodontic treatment. RE is often not diagnosable because of overlapping of distal root with radiographs. A thorough examination of the preoperative radiographs and the presence of any questionable differences in the radiographs may suggest RE. Cone beam computed tomography may be an ideal diagnostic aid in the management of RE as it provides a three-dimensional view of the extra root, length, and location [5].

The location of the additional canal orifice may be difficult because of overhanging dentine. If the orifice is not found, the root canal remains untreated and infected, or necrotic tissue remnants may remain in the root canal, leading to endodontic failure. With the distolingually located orifice of RE, a modification of the classical triangular access cavity to a trapezoidal form, so as to better locate and access the root canal, is essential.

### Guidelines for the management of radix entomolaris

The incidence of RE in the South Asian and Indian population is quite higher compared to populations of other ethnic groups. The maximum frequency of 3.4%–4.2% has been reported in the European population [6, 7]. In Indians and Eurasians it was reported <5% [5]. This mandates the endodontist to

compare various angulations of the radiographs to confirm the presence or absence of RE.

A detailed inspection of the pre-operative radiograph and interpretation of particular marks or characteristics, such as an outline of the distal root or the root canal, can indicate the presence of a 'hidden' RE [8].

Thorough clinical examination of the tooth crown, periodontal probing, and use of instruments like an endodontic explorer, JW-17 explorer, pathfinder and micro-opener helps in locating RE. A test using sodium hypochlorite in the pulp chamber produces "champagne effect" if pulp tissue is present in the canal. Sometimes an additional cusp (tuberculin paramolaris) or a dark line on the pulp chamber floor may hint an extra root [9]. Extending the triangular access cavity to a rectangular or trapezoidal form along with the complete removal of roof of pulp chamber help in finding the distolingual orifice. Visual aids such as a loupe, intraoral camera or dental microscope can also be useful [10].

## CONCLUSION

Knowledge of root canal morphology and anatomy is essential to obtain favourable outcome of root canal therapy. Use of loupes and dental operating microscope aids in the location of the root canal orifice. Proper mesial and distal angulation and

interpretation of radiographs help to identify supernumerary roots.

#### REFERENCES

1. Haapasalo M, Shen Y, Qian W, Gao Y. Irrigation in endodontics. *Dental Clinics*. 2010 Apr 1;54(2):291-312.
2. Carabelli G. *Systematisches Handbuch Der Zahnheilkunde*. 2nd ed. Vienna: Braumuller and Seidel; 1844. p. 114.
3. Carlsen O, Alexandersen V. Radix entomolaris: Identification and morphology. *Scand J Dent Res* 1990;98: 363-73.
4. Song JS, Choi HJ, Jung IY, Jung HS, Kim SO. The prevalence and morphologic classification of distolingual roots in the mandibular molars in a Korean population. *J Endod* 2010;36:653-7
5. Tu MG, Huang HL, Hsue SS, Hsu JT, Chen SY, Jou MJ, Tsai CC. Detection of permanent three-rooted mandibular first molars by cone-beam computed tomography imaging in Taiwanese individuals. *Journal of Endodontics*. 2009 Apr 1;35(4):503-7.
6. Steelman R. Incidence of an accessory distal root on mandibular first permanent molars in Hispanic children. *ASDC journal of dentistry for children*. 1986;53(2):122-3.
7. Pecora JD. Three-rooted mandibular molars in patients of Mongolian, Caucasian and Negro origin. *Braz Dent J*. 1992;3(2):113-7.
8. Calberson FL, De Moor RJ, Deroose CA. The radix entomolaris and paramolaris: clinical approach in endodontics. *Journal of endodontics*. 2007 Jan 1; 33(1):58-63.
9. Ingle JI, Bakland LK, Baumgartner JC. *Ingle's Endodontics Six*. PMPH-USA. 2008.
10. Nishat F, Paul R, Nagpal A. Endodontic management of radix entomolaris. *Guident*. 2016 Apr 1;9(5).