

## Case Report

### Endodontic treatment of mandibular molar with Radix Entomolaris: A case report

Dr. Mehak Jindal<sup>1</sup>, Dr. Namita Singh<sup>2</sup>, Dr. Winnie Sharma<sup>3</sup>, Dr. Arushi Sharma<sup>4</sup>

<sup>1</sup>, <sup>4</sup>MDS 3<sup>rd</sup> Year, <sup>2</sup>Principal, Professor and Head, <sup>3</sup>Senior Resident, Department of Pediatric and Preventive Dentistry, Baba Jaswant Singh dental college & hospital, Ludhiana, Punjab

#### ABSTRACT:

Mandibular molars often exhibit variations in root morphology, one such variation is the presence of additional roots, the radix entomolaris (RE) or radix paramolaris. Understanding these anatomical variations is crucial for successful endodontic treatment outcomes. This report presents the endodontic treatment of a mandibular molar with RE, discussing its prevalence, external morphological variations, and internal anatomy.

**Key Messages:** In this case report, we present a case of RE. Correct diagnosis of RE and understanding the RE's root inclination and root canal curvature is essential, as it requires a careful and tailored clinical approach to prevent or address procedural errors during endodontic therapy.

**Key words:** Anatomical variations, Endodontic Treatment, Mandibular Molar, Radix Entomolaris, Radix Paramolaris

Received: 20 July, 2024

Accepted: 31 July, 2024

**Corresponding Author:** Dr. Mehak Jindal, MDS 3rd Year, Department of Pediatric and Preventive Dentistry, Baba Jaswant Singh dental college & hospital, Ludhiana, Punjab

**This article may be cited as:** Jindal M, Singh N, Sharma W, Sharma A. Endodontic treatment of mandibular molar with Radix Entomolaris: A case report. Int J Res Health Allied Sci 2024; 10(4): 57- 59

#### INTRODUCTION

Successful healing of endodontic pathology hinges upon a comprehensive understanding of root morphology.<sup>[1]</sup> Mandibular first molars, renowned for their anatomical diversity, exhibit numerous variations.<sup>[2]</sup> In most instances, the mesial root has two root canals, terminating either in two separate apical foramina or merging into one at the apex. Conversely, the distal root commonly features a single kidney-shaped root canal, although a second distal canal may be present.<sup>[3],[4]</sup>

The number of roots can also vary, with the possibility of an additional third root termed the radix entomolaris (RE), which may be located lingually or buccally.<sup>[5]</sup>

#### CASE HISTORY:

A 9-year-old patient reported to the Department of Pediatric and Preventive Dentistry with the complaint of night pain in lower right back region of mouth. During clinical examination, the decayed tooth #46 exhibited signs of irreversible pulpitis. Radiographic assessment revealed presence of a

third root between mesial and distal roots (Figure 1).

Following anaesthesia, access preparation was done under rubber dam using a round bur and an Endo-Z bur. Initial negotiation of root canals was confirmed using a K-file size 10. A fourth canal (distolingual) was identified between the mesial and distal root canal orifices, closer to the distal orifices. The canal lengths was determined radiographically with K- and H- file ISO 15 size (Figure 2).

Irrigation was done using normal saline, 3% sodium hypochlorite and EDTA. Canals were shaped using the HyFlex EDM Rotary files (Coltene), following which master cone Intra-oral Periapical Radiograph (IOPAR) was obtained (Figure 3).

All canals were filled with gutta-percha, and the access cavity was sealed using Type IX glass ionomer cement (GIC).

Following obturation (Figure 4) the tooth was crowned (Figure 5).



Figure 1- PREOPERATIVE PHOTOGRAPH #46



Figure 2- WORKING LENGTH TAKEN USING IOPAR



Figure 3- SNUGLY FITTING MASTER CONES



Figure 4- OBTURATION DONE #46 AND SEALED WITH GIC

**DISCUSSION:**

According to literature, the prevalence of RE varies among different populations. In African populations, the frequency reaches a maximum of 3%, while in Eurasian and Indian populations, it is less than 5%.<sup>[2]</sup> On the other hand, in Mongoloid populations such as Chinese, Eskimo, and American Indians, the frequency ranges from 5% to more than 40%.<sup>[2]</sup> However, in Caucasians, RE is less common, with a maximum frequency of only 3.4% to 4.2%.<sup>[2]</sup>



Figure 5- SSC CROWN PLACED #46

The exact etiology behind formation of RE remains unclear. Curzon suggested that the 'three-rooted molar' trait demonstrates significant genetic penetrance, evident from its prevalence similarity in both pure Eskimo and Eskimo/Caucasian mixes.<sup>[6]</sup>

A RE is typically associated with the first and third mandibular molars, with rare occurrence on the second molar.<sup>[7]</sup> When present, it is often located distolingually, with its coronal third either fully or partially fused to the distal root. Its dimensions range from a short conical extension to a fully developed root with normal length and root canal.<sup>[7]</sup> Carlsen and Alexandersen classified RE into: A, B, C, and AC.<sup>[8]</sup> Type A: distally located with two normal distal roots; Type B: one normal distal root; Type C: mesially located; Type AC: central. This helps differentiate separate and non-separate RE. De Moor et al. proposed a classification system for RE based on its curvature, comprising three types [9]:

- Type I: a straight root/root canal.
- Type II: initially curved entrance that continues as a straight root/root canal.
- Type III: initial curve in the coronal third of the root canal, with a second curve beginning in the middle and extending to the apical third.

The overlapping of the RE and distobuccal roots on preoperative radiographs can result in diagnostic inaccuracies, potentially leading to missed canals. Such oversights may compromise the fundamental goal of endodontic therapy, which is to alleviate pain. Thorough examination of radiograph is a must. If uncertain, take another radiograph from a

different angle (about 30 degrees mesially or distally).

In addition to radiographic diagnosis, clinical examination of the tooth crown and analysis of the cervical morphology of the roots through periodontal probing can aid in identifying an additional root. An extra cusp or a prominent occlusal distal or distolingual lobe, along with a cervical prominence or convexity, may also suggest presence of an additional root.

The orifice of the RE can typically be found disto to mesiolingually from the main canal or canals in the distal root. Extending the triangular opening cavity to the (disto) lingual surface may result in a more rectangular or trapezoidal outline form. If the RE canal entrance is not clearly visible after removal of the pulp chamber roof, a more thorough inspection of the pulp chamber floor and wall, particularly in the distolingual region, becomes necessary. Visual aids such as a loupe, intraoral camera, or dental microscope can also be helpful in locating the RE canal orifice.<sup>[10]</sup>

The presence of a dark line in the pulp chamber floor indicates the RE canal orifice location. Exploring distal and lingual walls with an angled probe reveals overlying dentin or remnants of the pulp roof. Calcifications above the orifice should be removed for better visibility. Initially relocating the orifice to the lingual side is advised for straight-line access, but caution is needed to avoid excessive dentin removal on the lingual side, preventing perforation or stripping in severely curved roots.<sup>[10]</sup>

Severe root inclination or canal curvature, especially in the apical third (Type III RE), can cause shaping issues like straightening or ledging. Flexible nickel-titanium rotary files can help create a centered preparation shape, limiting coronal enlargement and relocating the orifice. However, in

cases with severe curvature or narrow canals, there's a higher risk of instrument separation. To minimize errors: start with small files (size 10 or less), use radiographs to assess length and curvature, establish a glide path before preparation.<sup>[1]</sup>

Correct diagnosis of RE and understanding the RE's root inclination and root canal curvature is essential, as it requires a careful and tailored clinical approach to prevent or address procedural errors during endodontic therapy.

#### REFERENCES:

1. Vertucci FJ. Root canal morphology and its relationship to endodontic procedures. *Endodontic Topics*. 2005.
2. Ballullaya SV, Vemuri S, Kumar PR. Variable permanent mandibular first molar: Review of literature. *J Conserv Dent*. 2013.
3. Thoden Van Velzen SK, Wesselink PR, De Cleen MJH. *Endodontologie*, 2nd ed. Bohn Stafleu Van Loghum, Houtem/ Diegem, 1995.
4. Fabra-Campos H. Unusual root anatomy of mandibular first molars. *J Endod* 1985
5. Carlsen O, Alexandersen V. Radix entomolaris: identification and morphology. *Scan J Dent Res* 1990.
6. Curzon ME. Miscegenation and the prevalence of three-rooted mandibular first molars in the Baffin Eskimo. *Community Dent Oral Epidemiol* 1974.
7. Nayak GB, Mali S, Jain A, et al. Three-rooted Mandibular Molars—An Endodontic Enigma: A Case Series. *CODS J Dent* 2019.
8. Carlsen O, Alexandersen V. Radix entomolaris: identification and morphology. *Scan J Dent Res* 1990.
9. De Moor RJ, Deroose CA, Calberson FL. The radix entomolaris in mandibular first molars: an endodontic challenge. *Int Endod J* 2004.
10. Ingle JJ, Bakland LK, Baumgartner JC. *Ingle's Endodontics Six*. PMPH-USA. 2008.