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Clinical Management of Radix Entomolaris in Mandibular Molars: A Case Series

Dr. Sagar Katariya[1], Dr. Kamal Bagda[2], Dr. Mihir Pandya[3], Dr. Akash Azad[4] , Dr. Priyanka Jagirdar[5]

Postgraduate Resident[1], Professor and Head[2], Professor[3], Associate Professor[4,] Postgraduate Resident[5]
Department of Conservative Dentistry and Endodontics,
Goenka Research Institute of Dental Science, Gandhinagar, Gujarat

***Corresponding Author:**
Dr. Sagar Katariya
Postgraduate Resident, Department of Conservative Dentistry and Endodontics,
Goenka Research Institute of Dental Science, Gandhinagar, Gujarat.

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Abstract

Radix entomolaris (RE) is an anatomical variation characterized by the presence of an additional distolingual root in mandibular molars. Failure to identify this variation may lead to missed canals and subsequent endodontic failure. Therefore, thorough knowledge of root canal anatomy and careful radiographic evaluation are essential for successful treatment outcomes.

This case series presents three clinical cases of mandibular molars exhibiting radix entomolaris, managed successfully with nonsurgical root canal treatment. In all cases, preoperative radiographs with altered angulations aided in the identification of the extra root. Access cavity preparation was modified to a trapezoidal form to facilitate proper location of the additional canal. Cleaning and shaping were performed using standard endodontic protocols, followed by obturation using appropriate techniques.

All cases showed satisfactory clinical and radiographic outcomes, with no postoperative complications observed during follow-up. The presence of radix entomolaris poses a significant challenge to clinicians; however, early diagnosis and appropriate modification in access cavity design can ensure effective management.

This case series emphasizes the importance of recognizing anatomical variations and adapting endodontic techniques accordingly to achieve predictable success.

Keywords: Access Cavity Modification; Anatomical Variation; Endodontic Treatment; Mandibular Molars; Radix Entomolaris; Root Canal Anatomy

Introduction

Successful endodontic treatment depends on a thorough understanding of root canal anatomy and its variations. Mandibular molars typically present with two roots; however, anatomical variations such as the presence of an additional root may complicate diagnosis and treatment. One such variation is Radix Entomolaris, characterized by the presence of an extra root located distolingually. [1]

The prevalence of radix entomolaris varies widely among different populations. Studies have reported a global prevalence ranging from approximately 0% to 12%, with an overall prevalence of around 3% in mandibular first molars.[2] In the Indian population, the incidence has been reported to be relatively low, approximately 2.5%, emphasizing the importance of careful diagnosis in routine clinical practice. [3]

Failure to identify this additional root can result in missed canals, leading to persistent infection and eventual endodontic failure. Advanced imaging techniques such as cone-beam computed tomography

(CBCT) and angled radiographs have been shown to significantly improve detection of such anatomical variations.[4] Furthermore, the presence of radix entomolaris often presents with increased root curvature, posing additional challenges during instrumentation and obturation. [5]

Management of teeth with radix entomolaris requires modification of the conventional access cavity design, typically to a trapezoidal or rectangular outline, to facilitate proper location and negotiation of the additional canal. Awareness of such variations and appropriate modification of endodontic techniques are essential to ensure successful treatment outcomes. [5]

This case series aims to present three clinical cases of mandibular molars with radix entomolaris and to highlight the importance of its identification and appropriate endodontic management.

Case Series:

CASE 1 ***(Figure 1)***

A 22-year-old male presented with pain in the lower left posterior region. Tooth #36 showed deep caries and tenderness on percussion, and was diagnosed with chronic irreversible pulpitis. Preoperative radiographs with altered angulation suggested the presence of an additional distolingual root consistent with Radix Entomolaris.

Following local anesthesia and rubber dam isolation, access cavity was modified to a trapezoidal form. An additional distolingual canal was located along with the main canals. Cleaning and shaping were performed using rotary instrumentation and copious irrigation. Obturation was completed using gutta-percha and sealer, followed by permanent restoration.

CASE 2 ***(Figure 2)***

A 28-year-old female reported with pain in the lower left posterior region. Tooth #46 was diagnosed with chronic irreversible pulpitis. Radiographic evaluation revealed an extra distolingual root suggestive of radix entomolaris.

Access cavity modification enabled identification of the additional canal. Biomechanical preparation was performed using standard protocols, and obturation was carried out using gutta-percha and sealer. The patient remained asymptomatic postoperatively.

CASE 3 ***(Figure 3)***

A 45-year-old female presented with pain in the lower right posterior region. Tooth #36 was diagnosed with chronic irreversible pulpitis. Radiographic examination confirmed the presence of an additional distolingual root.

Endodontic treatment was performed with modified access cavity preparation to locate the extra canal. Cleaning, shaping, and obturation were completed using conventional techniques. The patient showed satisfactory clinical outcome.

Discussion:

A comprehensive understanding of root canal anatomy and its variations is critical for the success of endodontic therapy. The presence of Radix Entomolaris represents an important anatomical variation that may complicate diagnosis and treatment if not identified preoperatively.[6]

The prevalence of radix entomolaris shows considerable variation among different ethnic groups, with a higher occurrence reported in populations of Mongoloid origin and a relatively lower incidence in Indian populations.[7] Despite its low frequency, the clinical significance remains high, as missed additional roots are a major cause of endodontic failure. [8]

Accurate diagnosis of radix entomolaris relies heavily on careful radiographic interpretation. Conventional intraoral periapical radiographs taken at different horizontal angulations can improve detection, while advanced imaging techniques such as cone-beam computed tomography (CBCT) provide superior visualization of root canal morphology.[9]

From a clinical perspective, the presence of an additional distolingual root necessitates modification of the conventional access cavity design. A trapezoidal or rectangular access cavity allows better localization and negotiation of the extra canal. [10] Furthermore, radix entomolaris is often associated with pronounced root curvature, which increases the risk of procedural complications such as instrument separation and canal transportation. [11]

In the present case series, all cases were successfully managed through careful radiographic evaluation and appropriate modification of access cavity design, enabling effective biomechanical preparation and obturation.

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These findings emphasize the importance of clinician awareness, early diagnosis, and adaptation of endodontic techniques in managing such anatomical variations to achieve predictable treatment outcomes.

Conclusion:

The presence of Radix Entomolaris represents a significant anatomical variation that can influence the outcome of endodontic treatment if not properly identified. Careful radiographic evaluation and a thorough understanding of root canal anatomy are essential for its diagnosis.

Modification of the access cavity design and adherence to proper endodontic protocols facilitate effective management of such cases. Clinician awareness and attention to anatomical variations play a crucial role in preventing missed canals and ensuring successful treatment outcomes.

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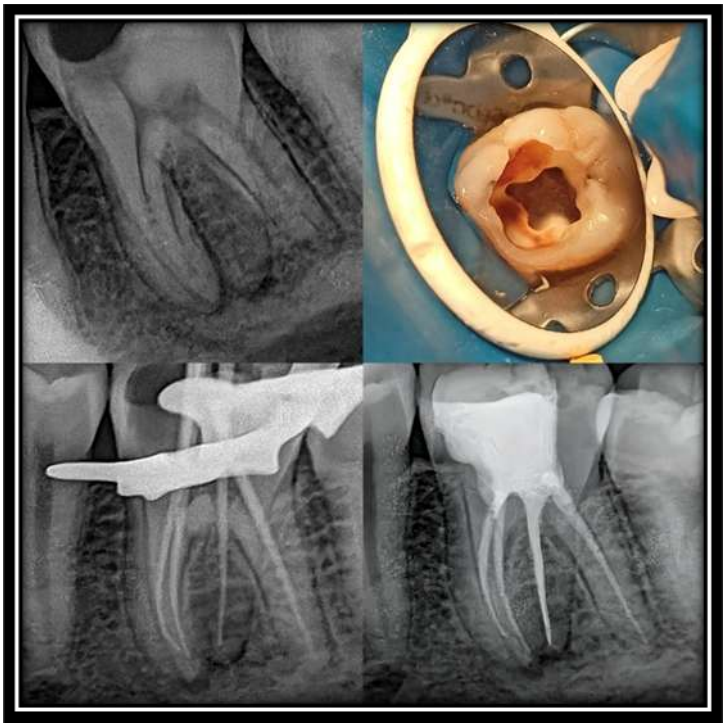
(Figure 1: Case 1)



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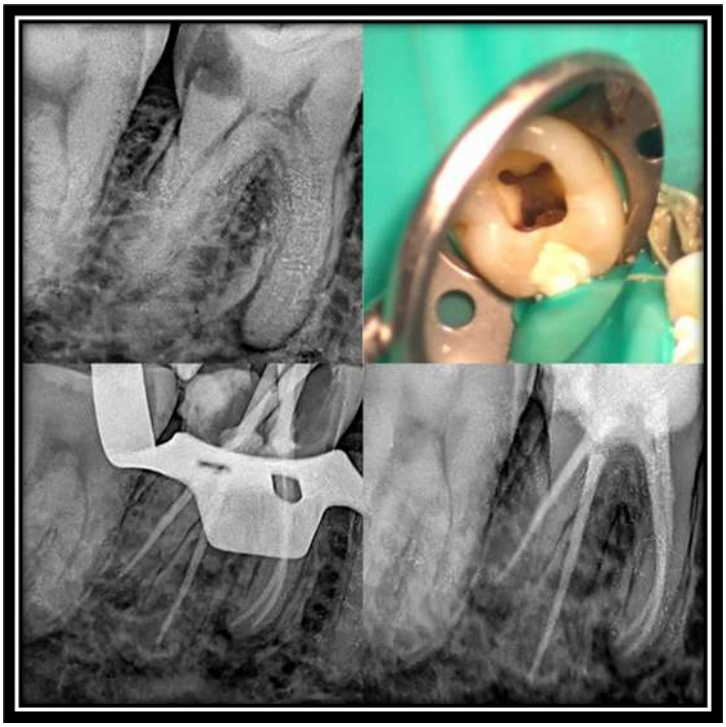
(Figure 2: Case 2)



(Figure 3: Case 3)

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