

UNRAVELING THE COMPLEXITY: A CASE REPORT ON THE MANAGEMENT OF MANDIBULAR LEFT SECOND PREMOLAR WITH TWO ROOTS

Dr. Seema V. Bansode

Associate Professor, Department of Conservative Dentistry and Endodontics, GDC & Hospital, Aurangabad/MUHS, India

Abstract: This case report presents a rare and intriguing clinical scenario involving the management of a mandibular left second premolar with two distinct roots. The patient, a 38-year-old female, sought dental treatment due to persistent pain and discomfort in the affected tooth. Radiographic examination revealed the presence of two separate roots, which presented a unique challenge in terms of diagnosis and treatment planning. The case details the comprehensive clinical evaluation, diagnostic imaging, and the subsequent endodontic therapy performed to address the complex root anatomy successfully. Through a combination of advanced imaging techniques and meticulous root canal instrumentation, the tooth was effectively salvaged, preserving its functionality and aesthetics. This report underscores the importance of recognizing and addressing atypical root canal morphologies, emphasizing the significance of individualized treatment approaches for optimal patient outcomes.

Keywords: Mandibular left second premolar, two roots, root canal morphology, endodontic therapy, diagnostic imaging, case report, dental treatment, root canal instrumentation, clinical evaluation, treatment planning.

INTRODUCTION

The human dentition's anatomical variations have fascinated dental practitioners and researchers alike for decades. Among these variations, the presence of additional roots in teeth represents a relatively rare occurrence, particularly in mandibular premolars. Such atypical root morphologies pose significant challenges for accurate diagnosis and successful management, often requiring specialized treatment approaches. This case report aims to document a unique clinical case involving a mandibular left second premolar with two distinct roots, presenting an opportunity to explore the intricacies associated with diagnosing and managing this dental anomaly. By shedding light on this complex scenario, we hope to contribute to the existing literature and enhance clinicians' understanding of endodontic management in cases of atypical root canal anatomy.

METHOD

The present case report follows a systematic and comprehensive approach in documenting the management of the mandibular left second premolar with two roots. Ethical approval was obtained from the Institutional Review Board before initiating the study, and informed consent was obtained from the patient for the publication of her case details and radiographic images.

The patient, a 38-year-old female, presented to the dental clinic with complaints of persistent pain and discomfort in the mandibular left second premolar region. A thorough clinical examination was performed, including evaluation of the patient's medical history, dental charting, and periodontal assessment. Radiographic evaluation, utilizing periapical and panoramic radiographs, was carried out to assess the tooth's root morphology and potential periapical pathologies.

To enhance the diagnostic accuracy, advanced imaging techniques such as cone-beam computed tomography (CBCT) were employed to visualize the internal root canal anatomy in three dimensions. The CBCT images allowed precise identification and characterization of the additional roots, providing critical information for devising an appropriate treatment plan.

After establishing the diagnosis of a mandibular left second premolar with two roots, the patient underwent endodontic therapy. The root canals were accessed using a dental operating microscope and ultrasonic instrumentation to ensure conservative and precise access cavity preparation. The canals were meticulously negotiated and thoroughly cleaned using a combination of hand files and rotary instrumentation. Sodium hypochlorite and ethylenediaminetetraacetic acid (EDTA) were used as irrigants to disinfect and debride the root canal system thoroughly.

Following root canal preparation, the canals were obturated using a warm vertical compaction technique with a biocompatible sealer and gutta-percha cones. The access cavity was sealed with a composite restoration to prevent coronal leakage and potential reinfection.

Postoperative radiographs and clinical photographs were taken to assess the quality of root canal fillings and restoration. The patient was scheduled for regular follow-ups to monitor the treatment's long-term success and overall tooth health.

The successful management of this complex case highlights the significance of utilizing advanced diagnostic imaging and tailored treatment approaches in handling atypical dental anatomies effectively. The findings of this report add to the body of knowledge concerning endodontic management and encourage a cautious and meticulous approach when addressing such intricate clinical situations.

RESULT

The clinical evaluation and radiographic examination revealed the presence of a mandibular left second premolar with two distinct roots, an extremely rare anatomical variation. The tooth exhibited signs of

Published Date: - 03-12-2017**E-ISSN:** 2454-4191**P-ISSN:** 2455-0779

pulpal and periapical pathology, explaining the patient's chief complaint of pain and discomfort. Advanced imaging with cone-beam computed tomography (CBCT) provided detailed three-dimensional visualization, confirming the presence of two separate and fully formed roots.

The endodontic therapy proceeded successfully, employing a combination of meticulous root canal instrumentation and advanced operating techniques. The canals were thoroughly cleaned, shaped, and obturated using a warm vertical compaction technique. The postoperative radiographs and clinical photographs demonstrated a well-sealed root canal system and a stable composite restoration.

DISCUSSION

The identification and management of atypical root canal anatomy represent critical challenges for endodontic practitioners. In this case, the presence of two roots in the mandibular left second premolar deviated from the conventional single-rooted morphology. This complexity could have been easily overlooked without the aid of advanced imaging modalities like CBCT. The ability of CBCT to provide detailed three-dimensional images played a pivotal role in accurately diagnosing and comprehensively planning the endodontic therapy for this case.

The successful treatment outcome can be attributed to several factors. First, the use of a dental operating microscope facilitated precise visualization and conservative access cavity preparation, preserving the tooth's structural integrity. Second, the ultrasonic instrumentation allowed efficient and conservative shaping of the root canals, reducing the risk of iatrogenic errors. Third, the irrigation protocol with sodium hypochlorite and EDTA effectively disinfected and debrided the complex root canal system.

CONCLUSION

This case report documents a unique and rare clinical scenario involving the management of a mandibular left second premolar with two roots. The successful endodontic therapy, guided by advanced diagnostic imaging and meticulous treatment techniques, highlights the significance of personalized approaches to address atypical root canal morphologies. The integration of cone-beam computed tomography (CBCT) in the diagnostic process proved instrumental in accurate treatment planning and successful execution.

This report underscores the importance of awareness and recognition of atypical root canal anatomy, urging dental practitioners to consider advanced imaging techniques when faced with complex dental cases. By presenting this case, we aim to contribute to the growing body of knowledge in endodontics, encouraging a cautious and patient-centric approach to ensure optimal treatment outcomes in similar clinical scenarios.

REFERENCES

1. Krasner P, Rankow HJ. Anatomy of the pulp-chamber floor. J Endod2004;30:5-16.

Published Date: - 03-12-2017

E-ISSN: 2454-4191

P-ISSN: 2455-0779

2. Rödiger T, Hülsmann M. Diagnosis and root canal treatment of a mandibular second premolar with three root canals. *Int Endod J* 2003;36:912-9.,
3. Amos ER. Incidence of bifurcated root canals in mandibular bicuspid. *J Am Dent Assoc* 1955;50:70-1.
4. Cleghorn BM, Christie WH, Dong CC. The root and root canal morphology of the human mandibular second premolar: A literature review. *J Endod* 2007;33:1031-7.
5. Llena C, Fernandez J, Ortolani PS, Forner L. Cone-beam computed tomography analysis of root and canal morphology of mandibular premolars in a Spanish population. *Imaging Sci Dent* 2014;44:221-7.
6. Vertucci FJ. Root canal morphology of mandibular premolars. *J Am Dent Assoc* 1978;97:47-50.
7. Zillich R, Dowson J. Root canal morphology of mandibular first and second premolars. *Oral Surg Oral Med Oral Pathol* 1973;36:738-44.
8. Singh S, Pawar M. Root canal morphology of South Asian Indian mandibular premolar teeth. *J Endod* 2014;40:1338-41.
9. Molander A, Reit C, Dahlen G, Kvist T. Microbiological status of root filled teeth with apical periodontitis. *Int Endod J* 1998;31:1-7.