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The Phantom Root: Clinical Resolution of a Radiographic Illusion in the Maxillary Posterior Region

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ABSTRACT

Background: Anatomical variations in maxillary third molars often complicate radiographic interpretation, especially in edentulous regions. This can lead to diagnostic challenges and potential overtreatment due to misidentification of structures.

Case Presentation:A 58-year-old male presented with intermittent pain in the upper right maxillary posterior region. Clinical examination revealed a grossly carious maxillary third molar and an absent second molar with no history of extraction. Periapical radiograph showed a radiopaque structure suggestive of a second molar root. Surgical exploration revealed that this image was due to an elongated, curved palatal root of the third molar mimicking the second molar root. No additional root structure was found.

Discussion: The case illustrates how anatomical deviations in third molar root morphology, combined with limitations of 2D imaging, can create illusions leading to misdiagnosis. Radiographic overlap and the absence of adjacent teeth further complicate interpretation. Awareness of such possibilities and use of 3D imaging like CBCT can prevent diagnostic errors.

Conclusion: Clinicians must maintain a high index of suspicion in cases of inconsistent clinical and radiographic findings. Knowledge of anatomical variations, corroborated with advanced imaging when needed, is essential to prevent unnecessary procedures.

Keywords: *Radiographic illusion, maxillary third molar, aberrant root morphology, misdiagnosis, CBCT, diagnostic imaging, edentulous maxilla*

1. INTRODUCTION

The upper third molars (wisdom teeth) are one of the teeth that show the highest degree of morphological variation among all permanent teeth. They have great anatomical variation because of the high number of roots that can be curved, fused, or directed in different ways, making clinical and radiographic evaluations difficult. Furthermore, this teeth tend to have a late eruption due to lack of space in the back of the upper jaw, leading to frequent impactions, an unusual positioning, and change

The radiographic interpretation in the region of the back maxilla is challenging since the maxillary sinus, zygomatic buttress, cranial pterygoid plates, and surrounding teeth all create overlapping anatomical image. Overlapping anatomy coupled with the defects of two-dimensional imaging can create artifacts and illusions that can simulate pathological conditions or anatomy. The absence of neighboring teeth, either as a result of prior dental treatment, congenital loss, or non-eruption, further eliminates landmarks for spatial orientation, increasing the risk of misinterpretation.

In particular, third molars with aberrant or excessively exaggerated root morphologies potentially can mimic adjacent teeth, or root remnants in conventional radiographs.

This case report illustrates a rare situation where an abnormally curved palatal root of a maxillary third molar produced a radiographic confusion of a maxillary second molar root within an edentulous area. This confusion could have readily resulted in misdiagnosis or overtreatment if not for the thorough clinical evaluation and intraoperative confirmation. The case is testament to the paramount significance of knowledge of anatomical variations and how they influence radiographic interpretation, particularly in the context of posterior maxillary imaging difficulties[1234]

2. CASE PRESENTATION

A 58-year-old male, Mr. Ravindra Kumar, reported with a chief complaint of intermittent pain in the upper right back tooth region for one week. His medical history was unremarkable. Intraoral examination revealed a grossly carious, maxillary right third molar. No maxillary second molar was present adjacent to this tooth, and the patient had history of extraction.

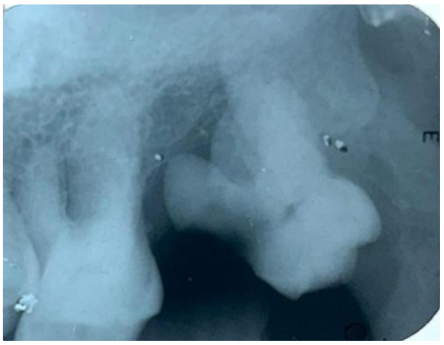

fig. 1
Radiograph(IOPA)

fig. 2
Extracted Tooth

A post-op intraoral periapical radiograph (Fig-1) was taken, which revealed a radiopaque structure resembling a root in the expected region of the maxillary second molar. The clinical and radiographic findings appeared discordant—raising the suspicion of a retained root of the second molar.However, upon extraction of the third molar (Fig-2), the mesio-buccal root was found to be elongated, curved mesially, and thickened, creating the radiographic illusion. No second molar root was retrieved, confirming that the overlapping radiopacity belonged solely to the third molar.

3. DISCUSSION

Radiographic misinterpretation based on anatomical variations or technical constraints continues to be a major challenge in dental diagnosis. In the posterior maxilla, convergence of several bony landmarks and soft tissue shadows tends to blur root anatomy clarity, especially with conventional intraoral periapical radiographs. The current case illustrates how an exaggeratedly curved palatal root, without a second molar, replicated the structure of a root belonging to the nearby tooth—creating an interesting optical illusion.

The illusion was caused by the position of the deviant root in relation to the bone and its overlap with the region of edentulism where the second molar would normally be. This radiopaque entity very much resembled a second root of a molar and might have been mistaken for a retained root, unerupted or impacted tooth, or radiopaque lesion. Other similar diagnostic mistakes have been reported in the conditions of atypical root dilacerations and ectopic placement of teeth, where superimposition on radiographs simulated pathological features[5].

White and Pharoah have stressed that a skewed or superimposed anatomical feature in 2D radiographs is one of the most common reasons for misdiagnosis in dental practice[1]. For such situations, CBCT imaging can act as an extremely helpful adjunct by providing three-dimensional images of the dental structures, thereby avoiding superimpositions and improving the diagnostic accuracy[6]. This should be used judiciously with radiation dose and clinical need.

Clinical experience continues to play a dominant role in resolving such inconsistencies. Here, a lack of a second molar in the clinical examination, in addition to patient history for no previous extraction, increased suspicion regarding the radiographic information. Surgical exploration revealed the anomalous third molar root as the only structure, without discovering any other root or tooth. This highlights the importance of a multifaceted diagnostic process involving clinical, radiographic, and surgical aspects.

Though the majority of practitioners use imaging extensively for diagnosis, this case highlights the shortcomings of 2D imaging and the importance of clinical correlation. Literature also indicates that unexpected morphologies of the roots are more frequent in maxillary third molars than other teeth, and such variations should be expected in radiographic assessment[3],[4].

Finally, timely identification and comprehension of such anatomical variations may be able to prevent misdiagnosis, avoid unjustified investigations, and mistargeted therapy. Better awareness, facilitated by evidence-based application of adjunct imaging and interprofessional collaboration, guarantees precise diagnosis and best outcome for the patients[1],[6].

4. CONCLUSION

Aberrant root morphology of maxillary third molars may lead to false-positive radiographic findings, especially in the absence of adjacent teeth. This case underscores the need for careful integration of clinical examination and radiographic interpretation. When in doubt, additional imaging such as CBCT may aid in ruling out misleading anatomical artifacts and prevent unnecessary surgical interventions.

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6. CONFLICT OF INTEREST

None

REFERENCES

[1] White SC, Pharoah MJ. Oral Radiology: Principles and Interpretation. 8th ed. Elsevier; 2018.

[2] Peterson LJ, Ellis E, Hupp JR, Tucker MR. Contemporary Oral and Maxillofacial Surgery. 7th ed. Elsevier; 2018.

[3] Neville BW, Damm DD, Allen CM, Chi AC. Oral and Maxillofacial Pathology. 4th ed. Elsevier; 2015.

[4] Gagnier JJ, et al. The CARE guidelines: consensus-based clinical case reporting guideline development. J Clin Epidemiol. 2014;67(1):46–51.

[5] Araki M, Matsumoto N, Seki K, Okano T. Diagnostic image quality of limited cone-beam computed tomography for evaluation of impacted teeth. Angle Orthod. 2006;76(5):773–779.

[6] Patel S, Dawood A, Ford TP, Whaites E. The potential applications of cone beam computed tomography in the management of endodontic problems. Int Endod J. 2007;40(10):818–830.