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RESEARCH ARTICLE

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UNUSUALLY LONG ROOT OF MAXILLARY LATERAL INCISOR: A RARE CASE REPORT WITH ADJACENT CENTRAL INCISOR ROOT CANAL TREATMENT

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ABSTRACT

The Successful root canal treatment depends on meticulous biomechanical preparation of canal, followed by proper obturation and prompt coronal restoration. To achieve this the clinician must possess a comprehensive understanding of both internal and external tooth morphology, including possible anatomical variations. At times, treatment may be required in root canal systems that deviate from the typical anatomical descriptions found in textbooks. This report highlights the endodontic procedure of unusually elongated maxillary lateral incisors. **Case Presentation:** A 23-year-old male patient was referred to clinic for endodontic treatment of left maxillary lateral incisor, presenting with a chief complaint of spacing that affected his dental aesthetics. During the procedure, the tooth was observed to have an unusually long canal, with a working length of 29mm. Root canal treatment was completed successfully, and the patient remained asymptomatic on follow-up. **Conclusion:** Though the patient presents a left maxillary lateral incisor with canal length in the upper limit of some reported cases, it is unusual in our environment.

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INTRODUCTION

Detailed knowledge of the internal and external morphology of teeth plays a vital role in achieving predictable outcomes in endodontic treatment. Human dentition exhibits a range of anatomical and morphological differences. Nonetheless, the documented occurrences of these variations in the maxillary lateral incisors are quite limited. The maxillary lateral incisor typically features one root and one canal; however, recent literature has documented several instances of dual-rooted maxillary lateral incisors. Maxillary lateral incisors exhibit variations in root length, with an average reported length of 20-24mm. In 1976, Weine⁹ released data on average tooth lengths in North Americans, which were derived from the working lengths of his patients through the radiographic technique. In a 1986 in-vitro study conducted by Okpo and Akpata⁸, the length of the maxillary lateral incisor was found to vary from 20.0 to 24.0mm, with an average of 22.5mm. There is, nevertheless, a lack of research on the length of maxillary lateral incisors among black Africans based on clinical studies. This case report details the endodontic treatment of a patient with an exceptionally long maxillary lateral incisor in our setting.

CASE PROFILE

A 23-year-old man was sent for the treatment of the left maxillary lateral incisor. Clinical examination revealed a no discoloration, swelling, or periodontal compromise.

The tooth responded positively to vitality testing, suggesting a normal pulpal status. The only concern expressed by patient was the spacing between the anterior teeth; although orthodontic treatment was discussed as a corrective option, the patient opted for root canal therapy owing to time constraints. Periapical radiographic examination demonstrated an unusually long root canal. Working length determination using an apex locator and confirmed with a radiograph established the measurement at 31 mm. No associated periapical pathology or cystic changes were detected.



Fig. 1. Orthopantomogram

Pre-op periapical X-ray view

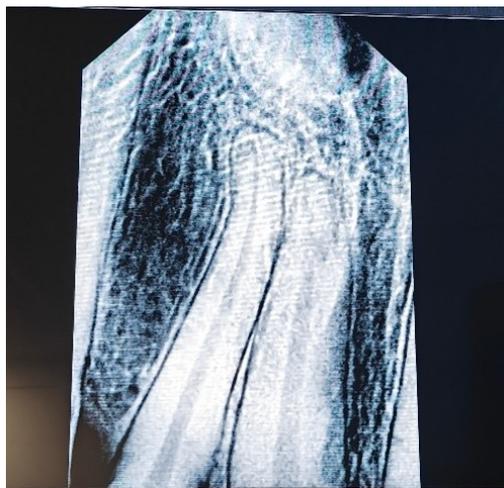


Fig. 2. Periapical View



Fig. 4. Immediate post-obturation

The tooth was isolated with rubber dam. Access gained to the pulp chamber from the palatal surface a triangular shaped cavity with apex pointing to the cingulum and base towards the incisal edge. A 25 mm ISO size 20 K file (Premier Dental Products Co, Canada, PA.) was placed in the root canal at full length without encountering any resistance, radiograph taken revealed that the file was short of the radiographic terminus by 4mm. Therefore, a size 29 mm ISO size 20 Kfile was then placed in the root canal at 29mm using digital tactile sensation and the repeated working length radiograph showed that the file was at the radiographic terminus (Fig. 3). Biomechanical preparation of the root canal was carried out with serial K files ranging from ISO size 20 to ISO size 29 (Premier Dental Products Co, Canada, PA.), using step back technique under continuous irrigation with 2.5% sodium hypochlorite solution (Reckitt Benckiser Ltd, Agbara, Nigeria). When preparation was completed, the canal was dried with paper points and a non-setting calcium hydroxide (Rite Dent Corp. FL, USA) dressing was placed within the canal and access cavity restored temporary with zinc phosphate cement (Prime Dental Manufacturing Inc., Chicago, Illinois). The Patient was recalled a week after. The tooth showed no symptoms and was not sensitive to tapping; the canal was dry and had no unpleasant odour. After removing the non-setting calcium hydroxide dressing in the canal, the canal was re-instrumented and copiously irrigated and then dried with paper points. Thereafter, the master cone was selected, radiograph taken to ensure it is at the radiographic terminus (Fig. 3). The root canal system was obturated by lateral compaction of gutta-percha coated with a calcium-hydroxide based sealer (Sealapex-Sybron/Keer USA) and access cavity restored with zinc phosphate cement (Fig. 4).

Working length determination

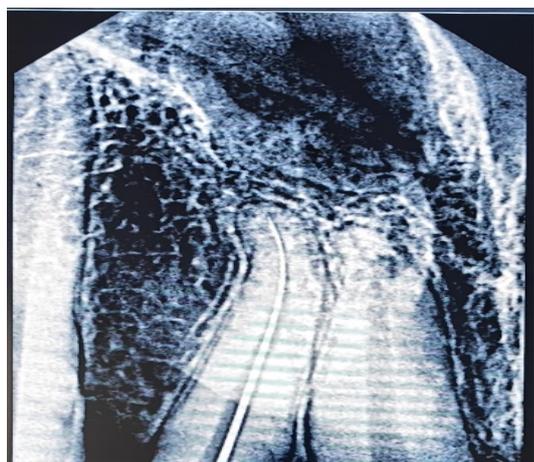


Fig. 3.

DISCUSSION

The mean root canal length in a population serves as a valuable reference for determining working length in root canal treatment, particularly when employing the digital tactile technique. According to Al-habib et al. in 2025, the typical length of the maxillary lateral incisor is 25.7 ± 2.8 mm. The patient in question has a maxillary lateral incisor with a working length of 31 mm, which is at the upper end of the established normal range; however, it is notably longer based on our clinical observations. Given that the referenced normal range of canal lengths was based on studies involving the Caucasian population and that racial variations in canal lengths have been noted, this case could indeed be considered unusually long for our demographic.

Declaration of Conflicting Interest: The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

CONCLUSION

Though other studies have reported longer canal length and the case presented represents an upper limit of the normal as reported by some studies, it is still unusual in our environment. Therefore, adequate preparation must be made for proper management of such cases when encountered.

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