Maxillary lateral incisors with two canals and two separate curved roots

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Abstract

Variation in the roots and root canal anatomy seems to be the norm rather than an exception. For a successful endodontic treatment, a clinician should have a thorough knowledge of the internal and external dental anatomy and its variations. Maxillary lateral incisors usually exhibit single canal with a single root. In this case, clinical examination and radiographs clearly demonstrates the presence of two root canals with two separate curved roots. This case report emphasizes the need for attention during endodontic management of maxillary lateral incisors.

Keywords: Maxillary lateral incisor, root canal, root canal anatomy, tooth morphology

Introduction

Many endodontic literatures project maxillary lateral incisors as a tooth with a single root and single canal.[¹⁻³] This may not be true in 100% of cases as case reports have advocated maxillary lateral incisors showing two roots with two or three root canals.[⁴⁻⁵] Successful non-surgical endodontic management depends upon thorough bacterial elimination and complete obturation of the root canal system. Failure to recognize and treat an extra-canal might provide a constant source of irritation, thereby compromising the long-term success of the root canal therapy.[⁶] Thus, it is essential to understand the morphology of the root canals and to assess numerous variations before initiating root canal treatment.[¹⁻²]

Case Report

A 25-year-old Indian female was referred by his general dentist for root canal treatment of the maxillary left lateral incisor (tooth 22). The general dentist referred the patient after observing its unusual root canal morphology with two separate curved roots in the pre-operative radiograph [Figure 1].

On clinical examination, tooth 22 did not appear to have any coronal morphological variation and was identical to its left counterpart. No discoloration of the crown was evident. The tooth had mild tenderness to percussion; however, there was no evidence of swelling or sinus tract. The mucosa and the underlying alveolar bone were not tender to palpation. Gingival probing depths and tooth mobility were within physiologic limits. The tooth did not respond to electric and thermal pulp sensibility tests whilst the contralateral and adjacent teeth responded within normal limits. Patient reported a possible history of trauma 10 years back. The tooth was diagnosed with asymptomatic irreversible pulpotis with chronic apical periodontitis.

After administering local anesthesia of 2% lidocaine with 1:100,000 epinephrine, endodontic access cavity was done on the palatal surface by using a no. 2 round bur and EX 24 bur (non-end cutting tapered fissure; Mani, Tochigi, Japan) under rubber dam isolation. Clinical exploration with a DG-16 endodontic explorer (Hu-Friedy, Chicago, IL, USA) revealed two root canal orifices in a mesio-distal direction. Pulp extirpation was performed by using a barbed broach (Dentsply Maillefer, Ballaigues, Switzerland) and K-files (Mani Inc., Tochigi, Japan). The canal was thoroughly debrided with copious irrigation of sodium hypochlorite (2.5%) and 17% ethylene diamine tetra acetic acid (EDTA) followed by saline (0.9%). Coronal flaring of the root canal was done by using Gates-Glidden drills no. 1-4 (Mani Inc.). The working length was determined by using the apex locator (Propex; Dentsply Maillefer) and confirmed radiographically.

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Cuxhaven, Germany) was placed as an inter-appointment medicament. The access cavity was sealed temporarily with Cavit (3M ESPE AG, Seefeld, Germany). The patient was recalled after a week at which time the tooth was asymptomatic. The root canals were irrigated, dried and filled by cold lateral compaction of gutta-percha using a zinc oxide eugenol sealer (Kemdent; Associated Dental Products Ltd., Swindon, UK). The access cavity was restored with glass ionomer cement (Fuji IX; GC Corp., Tokyo, Japan), and a postoperative radiograph was taken [Figure 2].

Discussion

The present case report demonstrates a rare case of maxillary lateral incisor teeth with two curved roots and two root canals, without exhibiting any morphological anomaly of the crown. Maxillary lateral incisor teeth usually exhibit single root with a single canal.[7] However, there are numerous case reports showing maxillary lateral incisor teeth with two canals,[8,9] three canals,[11,12] or even four canals.[13] Many of these cases often manifest clinically as gemination, fusion, concrescence, or dens invaginatus[14] since maxillary lateral incisors are often located at the site of high embryological risk.[15,16]

In this clinical report, the initial preoperative radiograph reveals the presence of two separate curved roots with two canals. Curving of the roots to this degree is almost a rarity in this type of tooth. The endodontic access cavity preparation was extended mesiodistally to improve the visibility and the access. The endodontic instrumentation was carried out with nickel–titanium hand instruments, considering the canal curvature.

Considering the fact that morphological variations exist in these teeth, it becomes mandatory that when a patient comes with persistent pain or sensitivity to hot and cold after root canal treatment, the clinician must suspect the presence of missed canals. Judicious use of high-end diagnostic aids should also be considered in such complex situations.[17]

Conclusion

The clinician should be always attentive to detect anatomic anomalies. Importance of careful preoperative evaluation cannot be over emphasized.

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Source of Support: Nil. Conflict of Interest: None declared.