

Maxillary Lateral Incisor With Two Roots : Case Reports

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Abstract

Maxillary lateral incisors are usually single rooted teeth. They are also located at a site of high embryological risk. Several developmental anomalies are often associated with these teeth. So during endodontic treatment it is important to understand the proper anatomy of the teeth. An awareness and understanding of the presence of unusual root canal morphology can thus contribute to the successful outcome of root canal treatment.

Keywords - Maxillary lateral incisor, Roots, Endodontic treatment.

Introduction

The main objective of root canal treatment is the thorough mechanical and chemical cleansing of the entire pulp cavity and its complete obturation with an inert filling material and a coronal restoration preventing ingress of microorganisms [1]. One of the main reasons for failure of root canal treatment is because the clinician has not removed all the pulp tissue and microorganisms from the root canal space and this may be due to inability to localize and treat all the canals of the root canal system. The risk of missing anatomy during root canal treatment is high because of the complexity of the root canal system [2].

Most literature refers to maxillary lateral incisor as a tooth with single root in 100% of cases [3,4,5,67]). However several authors have published cases of maxillary lateral incisors with two roots [8,9]. Most reported cases of two rooted maxillary incisors are result of fusion or germination and are usually associated with a macrodont crown. There are a few reported cases of two roots associated with normal crown dimensions [9]. These

anomalies pose a challenge even to the most experienced clinician in treating these teeth. This article describes an endodontic mishap in a maxillary left lateral incisor with two roots and its retreatment using surgical operating microscope and a case of maxillary lateral incisor with two roots.

Case report 1

A 34 year old male was referred with pain in relation to a previously root canal treated maxillary left lateral incisor. Radiographic examination revealed presence of a second root which was left untreated in the previous treatment. There was also a perforation on the furcation of that tooth. These endodontic mishaps had led to the failure of the case.

Clinically the tooth had no mobility or any sinus tract. The access cavity was properly prepared to determine the root canal anatomy of the tooth. A surgical operating microscope was used to locate the canal orifices and the furcal perforation. The obturating materials were removed from the canal and the perforation. One of the canals was negotiated and obturated but the other canal proved difficult to negotiate. So a surgical approach was performed under magnification for retrograde filling of the other root and to repair the perforation. MTA (Mineral tri oxide aggregate) was used for retrograde filling and for perforation repair. Patient was recalled after a week for review. Patient was asymptomatic during recall visits and 6 month postoperative radiograph revealed progressive healing.

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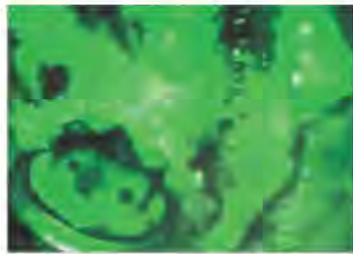
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Case - 1

**PRE-OPERATIVE
RADIOGRAPH**



**MAGNIFIED VIEW (24x) OF TWO
ROOT ENDS WITH PERFORATION**



**ROOT END FILLING AND
PERFORATION REPAIR WITH MTA
UNDER MAGNIFICATION**



**POST OPERATIVE
RADIOGRAPH**

Case report 2

A 26 year male was referred with pain in relation to a maxillary left lateral incisor. Radiographic examination revealed presence of two roots the main root was quiet normal in appearance and there was presence of an additional slender root from the cervical area of the main root. The tooth has periapical radiolucency. On palpation 22 was tender. Vitality test of 22 showed the tooth was non vital.

It was decided to do the root canal treatment in 22. Local anesthesia was administered, and a rubber dam was applied. Endodontic access cavity was done on the palatal surface of 22 by using a no. 2 round bur and Endo Z bur (non end cutting tapered fissure; Dentsply Maillefer, Ballaigues, Switzerland). The access cavity was extended to locate the other root canal. Pulp extirpation was performed by using a barbed broach (Dentsply Maillefer, Ballaigues, Switzerland) and K-files (Dentsply Maillefer, Ballaigues, Switzerland). The canal was thoroughly debrided with copious irrigation of sodium hypochlorite (5.2%), followed by saline (0.9%). Coronal flaring of the root canal was done by using Gates-Glidden drills no. 1 to 4 (Dentsply Maillefer, Ballaigues, Switzerland). The working length was determined by using apex locator (Propex; Dentsply Maillefer) and confirmed radiographically. Cleaning and shaping of the root canal

system were completed by using a step-back technique (apical enlargement was done up to ISO no. 55). The second root canal was prepared with Protaper rotary instrument (Dentsply Maillefer, Ballaigues, Switzerland). Canals were copiously irrigated with sodium hypochlorite (5.2%), followed by saline. The canals were dried with sterile paper points, calcium hydroxide (Ultracal XS; Ultradent, South Jordan, UT) was placed in the root canal, and the access cavity was temporized with Cavit G (3 M ESPE, Seefeld, Germany). The patient was recalled after 1 week. After a week, the tooth was asymptomatic, and the root canals were obturated with gutta percha using AH PLUS as a sealer. The access cavity was then sealed with resin composite.

Case 2

**PRE-OPERATIVE
RADIOGRAPH**



**WORKING
LENGTH**



**POST OBTURATION
RADIOGRAPH**

Discussion and Conclusions

Maxillary lateral incisors are located at a site of high embryological risk [8]. Several developmental anomalies are often associated with teeth, i.e. dens invaginatus, palate-radicular grooves, talon cusp and peg shaped. Root canal therapy in this tooth is not always easy. The etiology of two roots in a lateral incisor is unknown. Authors have given different opinions regarding its development.

- Presence of two roots in maxillary incisors can be a result of fusion or gemination. The phenomenon of gemination arises when two teeth develop from one tooth bud and as a result the patient has a larger number of teeth. Fused teeth arise through union of two normally separated tooth germs, and depending upon the stage of development of teeth at the time of union, it may be complete or incomplete. In case of fusion between two permanent teeth, patient would appear to be missing a tooth. However fusion can also be the union of a normal tooth germ to a supernumerary tooth germ. In these cases, the number of teeth is also normal and differentiation from gemination may be difficult. Neville et.al used the term supernumerary roots in describing the development of an increased number of roots on a

tooth compared with the classical description in dental anatomy [10].

- Kelly JR [11] presumed that at the time of root formation the surface of the root or the forming periodontium (Hertwig's epithelial root sheath) suffered some traumatic injury, and as a result of that, a radicular shaped accessory formation developed.
- During the fourth and sixth weeks of human embryonic development, the upper jaw, from which the lateral incisors originate, forms by fusion of the paired median nasal processes (MNP) and maxillary processes (MP). As the MNP fuse with each other, they form the premaxilla, including the medial portion of upper lip (philtrum) and the primary palate [12]. Exact origin of the maxillary lateral incisor relative to the MNP/MP fusion area and the location of the premaxillary/maxillary suture in the human is an open question. The MNP/MP fusion area may be medial to the lateral incisor or at the medial or middle one-third of the lateral incisor. The premaxillary/maxillary suture may be between the lateral incisor and canine or at the middle one-third of the canine [13, 14, 15]. For these reasons, maxillary lateral incisors may show various root canal morphology [16, 17].

This case reports demonstrate the need for greater attention when treating the root canal of maxillary lateral incisors and also the need for developing quality radiograph at various stages of endodontic therapy and their thorough evaluation to prevent mishaps. It is also important to bring awareness among the general dental practitioners that the truism and statistics of 100% single rooted incisors is not necessarily true. An awareness and understanding of the presence of unusual root canal morphology can thus contribute to the successful outcome of root canal treatment.

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