Accidental Finding of Maxillary Lateral Incisor with Two Roots after Extraction of Tooth: A Rare Case Report with Review of Literature

Mohammed Abed Basihí, Fatima Abdullah Ahmad Shaik, Taym Hadi Ahmed Khormi, Abdulaziz Ali Alhazmi, Yazeed Khalid Al-Shamrani, Fareedi Mukram Ali

1Final Year Dental Student, College of Dentistry, Jazan University, Saudi Arabia
2General Dental Practitioner, Khamis Mushait Maternity and Children Hospital, Khamis Mushait, Saudi Arabia
3General Dentist; Rawah Beauty Clinics, Clinical attachment; Oral & Maxillofacial Surgery Department, Prince Mohammed Bin Nasser Hospital, Jazan City, Saudi Arabia
4Department of Oral & Maxillofacial Surgery, College of Dentistry, Jazan University, Jazan, Saudi Arabia

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*Corresponding author: Fareedi Mukram Ali
Department of Oral & Maxillofacial Surgery, College of Dentistry, Jazan University, Jazan, Saudi Arabia

Abstract

Maxillary incisors have a single root, according to many studies on internal anatomy. The primary objective of this article is to describe the two-rooted permanent maxillary lateral incisor and also conduct a review on all reported cases of maxillary lateral incisors with two roots emphasizing on its etiology and prevalence among racial population.

Keywords: Maxillary Lateral Incisor, Two roots, Root Anatomy.

INTRODUCTION

A thorough understanding of the anatomy and morphology of the teeth’s root canal system is essential for the effective completion of root canal therapy, as well as several other dental and surgical procedures. All dentists working in various dental specialties need to be aware of potential complications since differences in the internal and external anatomical and morphological characteristics of teeth affect the number of dental treatments come good.

Maxillary incisors are known to have a single root in most anatomical investigations, however there may be differences in the number of lateral canals and/or location of the apical foramen [1]. The latest editions of endodontic textbooks state that 100% of cases involving maxillary lateral incisors have a single root [2, 3]; however, there are other reports in the literature of cases with two canals [4-8]. Few reports have also been documented anatomical differences, such as three root canals [9] or even four root canals [10].

A single root and one canal are typical features of the maxillary lateral incisors; nevertheless, reports of anatomic abnormalities, including supernumerary roots, have been made. Anatomical complications such as additional roots and canals can be very difficult to treat with endodontics, even if they are rare [11].

Unfavorable treatment outcomes might result from negligence and lack of knowledge regarding variations in root canal morphology, which can cause problems with cleaning and shaping the entire root canal system during endodontic treatment.

The aim of this paper is to present a rare case of maxillary lateral incisor with two roots without any developmental anomalies and also conduct a review on all reported cases of maxillary lateral incisors with two roots emphasizing on its etiology and prevalence among racial population.

CASE REPORT

A 45-year-old Saudi male patient was referred to oral surgery student’s clinic with the chief complaint of pain and difficulty in eating food. Clinical examination reveals Grade III mobility with #21, #22. Extraction of #21 and #22 was planned. Informed consent was taken from the patient for extraction. 2% lidocaine with 100,000 epinephrine was given as infiltration buccally and palatally. Extraction of #21 and

#22 was carried with maxillary anterior forceps. After the extraction of #22, the two roots of maxillary left lateral incisors was noticed (Figure 2, 3, 4). Hemostasis was achieved by gauze pressure. Post-operative instruction was given to the patient and patient was dismissed.

Figure 1: OPG of patient

Figure 2: Maxillary Lateral incisor showing two roots after extraction

Figure 3: Mesial View of lateral incisor
DISCUSSION

This case study presents a unique instance of maxillary lateral incisor teeth that have two roots and two root canals without showing any crown morphological abnormalities. In most cases, maxillary lateral incisor teeth have a single root and one canal. A clinician should be made to take into account situations like fusion and gemination when two roots or two root canals are present in maxillary incisors. These changes are typically observed when the crown surface is defective labially or lingually, or when the crown is unusually large [12]. The tooth in question in this case report was not macrodont. Preoperative radiography made it difficult to identify, and the widespread belief that maxillary incisors always have a single root.

Table 1: Previous case reports of maxillary lateral incisor with two-roots

<table>
<thead>
<tr>
<th>S. N</th>
<th>Author / Year</th>
<th>Country</th>
<th>Age</th>
<th>Gender</th>
<th>Side</th>
<th>Findings</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Fried &amp; Winter/ 1984 [14]</td>
<td>-</td>
<td>28</td>
<td>Female</td>
<td>-</td>
<td>Palatal Groove</td>
<td>RCT</td>
</tr>
<tr>
<td>3</td>
<td>Peikoff MD / 1985 [36]</td>
<td>Canada</td>
<td>34</td>
<td>Male</td>
<td>#22</td>
<td>Baddly carious; lingual groove.</td>
<td>Extraction</td>
</tr>
<tr>
<td>4</td>
<td>Yoshikawa et al., 1987 [15]</td>
<td>Japan</td>
<td>13</td>
<td>Female</td>
<td>-</td>
<td>Palatal groove</td>
<td>RCT</td>
</tr>
<tr>
<td>5</td>
<td>Pecora JD / 1991 [16]</td>
<td>Brazil</td>
<td>40</td>
<td>Male</td>
<td>#12</td>
<td>Non Vital</td>
<td>RCT</td>
</tr>
<tr>
<td>6</td>
<td>Collins II / 2001 [1]</td>
<td>Australia</td>
<td>28</td>
<td>Male</td>
<td>#22</td>
<td>Non Vital</td>
<td>RCT</td>
</tr>
<tr>
<td>7</td>
<td>Platt JA /1995 [17]</td>
<td>-</td>
<td>48</td>
<td>Female</td>
<td>-</td>
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</tr>
<tr>
<td>8</td>
<td>Venugopal &amp; Srirekha, 2010 [18]</td>
<td>India</td>
<td>24</td>
<td>Male</td>
<td>#12</td>
<td>Missed RCT in second root, grade II mobility</td>
<td>Re-treatment</td>
</tr>
<tr>
<td>9</td>
<td>Ravindranath / 2011 [19]</td>
<td>India</td>
<td>16</td>
<td>Female</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Gandhi A / 2011 [20]</td>
<td>India</td>
<td>30</td>
<td>Male</td>
<td>#22</td>
<td>Radicular groove</td>
<td>Root resection</td>
</tr>
<tr>
<td>11</td>
<td>Mohan AG/ 2012 [4]</td>
<td>India</td>
<td>25</td>
<td>Female</td>
<td>left</td>
<td>Non vital</td>
<td>RCT</td>
</tr>
<tr>
<td>12</td>
<td>Matta MS/ 2012 [21]</td>
<td>India</td>
<td>20</td>
<td>Male</td>
<td>Right</td>
<td></td>
<td>RCT</td>
</tr>
<tr>
<td>13</td>
<td>Lee MH / 2013 [22]</td>
<td>Korea</td>
<td>26</td>
<td>Male</td>
<td>#12</td>
<td>chronic apical abscess with sinus</td>
<td>RCT</td>
</tr>
<tr>
<td>14</td>
<td>Das U / 2014 [23]</td>
<td>India</td>
<td>34</td>
<td>Male</td>
<td>Left</td>
<td>Previously RCT</td>
<td>Re-Treatment</td>
</tr>
<tr>
<td>15</td>
<td>Hoseini A / 2014 [24]</td>
<td>Iran</td>
<td>16</td>
<td>Female</td>
<td>Right</td>
<td>Non vital tooth with acute apical periodontitis</td>
<td>RCT</td>
</tr>
<tr>
<td>16</td>
<td>Makade CS / 2014 [25]</td>
<td>India</td>
<td>27</td>
<td>Male</td>
<td>left</td>
<td>Non vital</td>
<td>Retreatment</td>
</tr>
<tr>
<td>17</td>
<td>Hafiz A / 2014 [26]</td>
<td>India</td>
<td>14</td>
<td>Male</td>
<td>left</td>
<td>Non vital</td>
<td>RCT</td>
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Maxillary lateral incisors can have various configurations of root canals, especially in the Turkish population [50, 51]. Kuzekanani M reviewed the literature, it was shown that, compared to other racial groups, Turk, Asian, and South (Latin) American people are more likely to have extra roots and root canals in their maxillary lateral incisors [52].

A brief literature review for this paper revealed 26 cases reporting maxillary lateral incisors with two roots. 50% (13) of the cases are reported from India followed by Iran (3 cases). Most of the cases reveal that injuries sustained during root formation to either the root’s surface or the developing periodontium, which is Hertwig’s epithelial root sheath.

Before beginning an endodontic procedure, a thorough understanding of the internal anatomy of the root is required. Among the primary reasons endodontic treatment fails are a complex internal architecture and undiscovered canals [53]. Given the morphological variances in these teeth, the clinician must always assume the presence of missing canals when a patient presents with chronic discomfort or sensitivity to hot and cold following root canal therapy. In cases this complex, the prudent use of high-end diagnostic tools should also be taken into account [54].
In order to enhance their ability to identify anatomical abnormalities, periapical radiographs with different angulations might be taken. It is essential and strongly encouraged to perform thorough radiographic evaluations using Clark’s rule and to take parallel angle radiographs both before and during endodontic treatments in order to correctly diagnose and treat these types of circumstances. Cone-beam computed tomography (CBCT), one of the newest radiography techniques, can also be highly useful in identifying anatomical characteristics and variations of the root canal system [22, 55]. Notably, CBCT is a three-dimensional X-ray imaging technique with great resolution that can be highly helpful in detecting the exact position of any extra roots [55].

CONCLUSION

The present case report emphasizes that even in the absence of dental defects, maxillary lateral incisors may have abnormal root structure. It is imperative for increasing awareness among general dental practitioners regarding the facts pertaining to 100% single-rooted maxillary lateral incisors.

REFERENCES

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