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Primary Maxillary Second Molar with a Unique Root Morphology- A Case Presentation

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ABSTRACT:

Morphological variations in primary teeth are uncommon in day-to day dental practice. Adequate diagnostic investigations and imaging is necessary to treat such anomalous teeth. This article presents a case where a palatal swelling was seen with respect to tooth number 55 and 16. The primary right maxillary second molar was seen having two palatal roots radiographically. The treatment plan involved emergency access opening followed by extraction of 55.

1. Introduction

Having an understanding of the size, shape, and inconsistency of root canals in deciduous teeth is imperative while observing the pulp cavity during endodontic therapy. Understanding the intricate root canal system is essential for successful endodontic therapy. Many mistakes are made when access cavities are being prepared or when locating the canal orifices, as these tasks rely on the dentist's tactile awareness and micro-anatomic expertise. It has been claimed that the quality of root canal preparation can be assessed more accurately with computed tomography (CT) than with conventional techniques such radiographic imaging, cross-sectioning, and longitudinal cleavage. [1]

The present case report describes the case of a young child with a unique root morphology of primary maxillary second molar.

2. Case presentation

A nine year old male, reported to the department of Pediatric Dentistry, Bharati Dental College and Hospital, Sangli, Maharshtra, for a routine dental check-up. He had been operated on, for removal of cyst from left mandibular region of jaw. While performing the dental check-up, a swelling was noticed in the right palatal region of maxillary arch. On asking the patient and parents, both revealed that the child was asympotamatic. Hence it was an accidental finding.

The swelling was rubbery in consistency, extending from the mesial surface of 55 to the distal surface of 16. It was the same colour as that of the surrounding mucosa and pus was expressed when it was pressed (Figure 1-a,b.)

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Figure 1- a. Maxillary arch intra-oral photograph showing swelling in palatal region of 55.

Figure 1-b. Two palatal orifices seen after access opening.

Patient was prescribed the following medication- Amoxycillin, Metronidazole and Ibuprofen tablets. The patient was referred for further investigations.

Investigations

An Orthopantomogram (OPG) didn't reveal any significant findings, only that, the successor tooth bud of 55 was slightly displaced (Figure 2). Owing to this and also his previous history of cystic lesion, the patient was referred for a CBCT scan.

Figure 2- Orthopantomogram showing periapical radiolucency in 55 region.

CBCT scan (Figure 3) showed rarefaction of the palatal region with 55, along with breach in the continuity of the palatal plate of bone. The radiolucency was spread upto the floor of the maxillary sinus, but didn't involve the sinus.

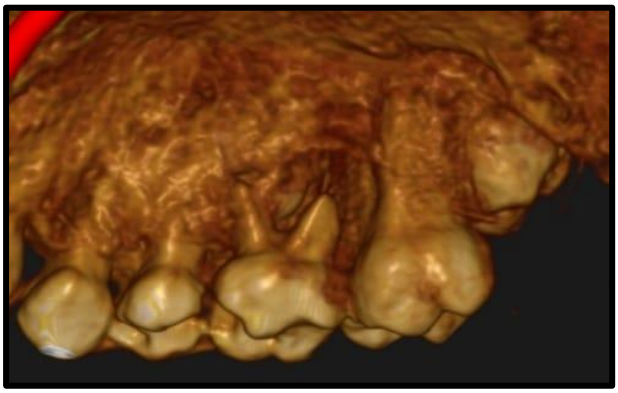

Figure 3- CBCT scan image of 55 showing two palatal roots.

The interesting finding observed in the scan was that, the tooth 55 had two palatal roots. The mesiobuccal and distobuccal roots were severely resorbed. The Distopalatal root also showed some resorption. Hence it was decided that pulpectomy of 54 and extraction of 55 should be performed.

Further, stainless steel crown will be planned with 54 along-with space maintainers for 55 and 75 region.

3. Treatment

An access cavity was prepared with 54, 55. Intra-canal debridement was done followed by saline irrigation.

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Two days later, the swelling was only slightly reduced, so minimal instrumentation was done with 55 and biomechanical preparation of 54 was done.

The patient was again recalled after three days. The swelling had reduced significantly in the palatal region. Hence, obturation and post-obturative restoration was done with 54 followed by extraction with 55.

The patient was kept on routine follow up, to monitor the reduction in swelling of the palatal region (Figure 4). After the swelling completely regressed, pre-formed stainless steel crown was cemented with 54.

Figure 4- Reduced swelling in palatl region with 55 seen in the subsequent visit.

4. Discussion

The factors influencing the likelihood of root canal therapy success are determined by one's familiarity with the intricacy of root canal systems. Dental periapical radiography is frequently employed in endodontic and diagnostic assessments. However, because periapical radiography only produces two-dimensional pictures, there may be some blind spots when evaluating the anatomy of the root canal. [2]

In order to shed light on the root canal morphology, a number of studies have employed additional methods such canal staining and micro computed tomography (CT) scanning of extracted teeth. The disadvantages of these procedures include small sample sizes of excised teeth and the loss of tooth structure by injection of coloring substance. Furthermore, there aren't many studies assessing the root canal procedure in Indian pediatric patients.

A CBCT examination of primary maxillary and mandibular molars was conducted by Sim and Mah (2019). The study described various root canal morphologies of the primary maxillary second molar. According to the study, the primary maxillary molar typically has one canal per root. Also, 36.9% of second molars and 4.3% of primary maxillary first molars had two canals in their mesio-buccal (MB) roots.[3]

According to Joseph (2005), two canals were present in the MB roots of 6.67% of primary maxillary first molars and 53.3% of second molars.[4] A staggering 22.8% of the primary maxillary first molars and 66% of second molars in a research on juvenile patients from Korea had two canals in the MB root. Two palatal roots were exclusively seen in maxillary second molars. Each of the two palatal roots had a canal when there were two of them. The palatal and disto-buccal roots fused together in 40% of primary maxillary molars, despite the fact that each root had its own canal. This result was in line with the findings of earlier research by Wang (2013)[2] and Bagherian (2010).[5]

In their research, Sarkar and Rao (2002) discovered that twenty-two percent of the primary maxillary second molars in their tooth sample had four canals. [6] Similarly, four samples (26.6%) contained four canals according to Zoremchhingi's assessment in 2005.[4] If it existed, the fourth additional canal was only observed in the mesio-buccal or disto-buccal roots—not in the palatal root.

According to Taylor (1986), if there is an extra cusp in the primary maxillary second molar's crown, there may be an additional root present as well. Furthermore, the size of the extra cusp does not predict the presence of other roots.[7] According to Carlsen and Alexandersen (2000), maxillary molars with two palatal roots had a prominent structure on the palatal side of the crown. The palatal root located on the same side of the prominence was recognized as the additional root.[8]

Seldom has research been done on the relationship between the permanent successor's rotation or displacement and the extra root of the primary molar. Due to uneven root resorption by the permanent successor, an extra root in a primary tooth may interfere with the eruption of the successor and the primary tooth's exfoliation. Premolars may exhibit rotation as a result of asymmetric root resorption in primary molars.[9]

Hence, clinicians should expect to find two separate canals in primary maxillary molars even when one fused root is observed in periapical radiographs.

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5. Conclusion

Since radiographs are superimpositions of overlying structures, it may obscure the structure of interest and might not represent the actual morphology. Therefore there are limitations in the value of radiographs alone in describing certain aspects of root canal morphology. Three dimensional images of primary molars may provide better clues and knowledge of variations in root canal morphology. It would improve the Clinician's interpretative capability for correct diagnoses.

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