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Three-rooted Maxillary and Bi-rooted Mandibular Primary Canines: A Case Report

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ABSTRACT

Multi-rooted primary canine is a rare anomaly in the primary dentition. The most common and normal form of root morphology in primary canines is a single root, while rare cases of bi-rooted or three-rooted canines have been reported in different ethnic groups. This anomaly is often discovered accidentally on routine radiographs. The anomaly often occurs bilaterally in the maxilla. This report presents a case of bilateral three rooted maxillary and unilateral bi-rooted mandibular primary canines in a four-year-old Iranian boy. This study aims to increase clinicians' awareness regarding this unique variation and emphasize the importance of radiological examination prior to root canal treatment.

1. Introduction

Primary and permanent dentition may be subjected to considerable variations in anatomy and morphology. Abnormalities of tooth morphology are more common in permanent dentition while compared to the primary dentition.^[1] The most common and normal form of root morphology in primary canines is a single root, while rare cases of bi-rooted or three-rooted canines have been reported in different ethnic groups.^[2, 3] The prevalence of bi-rooted primary canines is more in the maxilla in comparison to the mandible, and they usually occur bilaterally with a higher incidence in male children.^[2, 4] The crowns of affected teeth have normal dimensions, and no mesiodistal elongation was observed.^[5] The exact etiology of this anomaly is poorly understood; trauma or other disturbances in morph differentiation may affect root form and size. In multirooted teeth, an unknown factor stimulates continued morph differentiation.^[5] The ingrowth of tissue from Hertwig's epithelial root sheath (HERS) has been suggested as a possible mechanism of multiple root formation.^[6] In most bi-rooted primary canines reported to date, the root furcations were observed in the coronal third.^[5] This report presents a case of bilateral three rooted maxillary and unilateral bi-rooted mandibular primary canines in a four-year-old Iranian boy, which has not been reported in studies so far. Few cases of multi-rooted primary canine have been reported to date, and only rare cases were observed in both jaws.^[7-10] The aim of this study is to increase clinicians' awareness regarding this unique variation and

emphasize the importance of radiological examination prior to root canal treatment.

2. Case presentation

A 4-year-old boy with the chief complaint of tooth pain and tooth decay was referred to the Department of Pediatric Dentistry, Faculty of Dentistry, Shahid Beheshti University of Medical Sciences, and Tehran, Iran. The patient's medical history did not reveal any systemic abnormality or congenital disease. Dental history indicated that the patient was not cooperative within previous dental visits. A periapical radiograph was prescribed to achieve a comprehensive treatment plan; however, panoramic was obtained due to lack of cooperation and gag reflex. Clinical and radiographic examinations indicated that root canal therapy and restoration of primary teeth were necessary. Bilateral three rooted maxillary canines and unilateral double rooted mandibular canines were found accidentally in radiographic examination (Fig. 1). In order to control anxiety and the gag reflex, dental treatment under mild-moderate sedation was suggested.

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Fig. 1. Bilateral three rooted maxillary and unilateral bi-rooted mandibular primary canines.

3. Discussion

Multi-rooted primary canine is an extremely rare dental anomaly in primary dentition. Researchers have previously reported cases of bi-rooted primary canines, while three-rooted primary canine was reported only in one article.^[3] This anomaly is more common in the maxilla than mandible, with a higher tendency to occur bilaterally in male children.^[1, 2] The cases have been reported in various ethnic groups such as Japanese, African-American, Caucasian, and Pueblo Indian children^[9-12] and are not limited to specific groups. Although the etiology of this anomaly is not completely recognized, various hypotheses have been suggested; differential growth of Hertwig's epithelial root sheath (HERS)^[6], the defect of the dental lamina in early stages of root formation^[1], environmental induced cell changes resulting in abnormalities in the morpho-differentiation stages, and genetically induced abnormalities of morpho-differentiation stages^[7] trauma and other disturbances which may affect morpho-differentiation.^[2] This anomaly can be associated with complications in normal exfoliation and permanent teeth eruption. In order to facilitate eruption, the permanent canine has to resorb two or three roots. Therefore close observation is mandatory to ensure normal exfoliation of primary canine and normal path of eruption in permanent canine. Also, extraction and root canal treatment should be done with caution. During extraction, it should be ensured that the permanent tooth bud is not trapped in the inter radicular area of the primary tooth, which may cause the accidental removal of the developing permanent tooth. During root canal treatment, it should be noted that several canals may exceed the number of roots.^[1, 2] Since various abnormalities such as single-rooted primary first molars^[13] additional root in the primary second molar^[14] and multi-rooted primary canines have been reported in primary dentition and these anomalies cannot be detected clinically and may affect the treatment plan, this report highlights the importance of radiographic evaluation prior to treatment in order to detect possible abnormalities.

4. Conclusion

Multi-rooted primary canines are very rare. Accurate radiographic evaluation should be performed to identify this anomaly. Clinicians should consider specific considerations during extraction and root canal treatment. Also, close observation during exfoliation is essential to prevent subsequent problems.

Conflict of Interest

The authors declared that there is no conflict of interest.

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