CASE REPORT
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Unilateral Single-Rooted Primary First Molars in two siblings: A Case Report

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Abstract:

Objective(s): Single-rooted primary molar in considered to have a genetic origin. Knowledge of the root canal morphology is essential to achieve optimal pulp treatment in primary teeth. The occurrence of single-rooted and single-canal molars in primary dentition is extremely rare. **Case:** This study presents unilateral mandibular primary first molars with a single pyramidal root in two sisters, discovered in pre-operative radiographs. Pulpotomy and stainless steel crown treatment was performed for one of them that had deep caries involving the pulp. The treatment was considered successful at the 6-month follow-up. **Conclusion:** Obtaining radiographs prior to the treatment is essential to diagnose and properly manage single rooted molars.

Keywords: Deciduous Teeth; Tooth Abnormalities; Tooth Root

Introduction

Development of primary teeth begins in the sixth week of gestation and involves various stages, each of which can be disrupted, leading to dental anomalies [1]. Mesenchymal tissue initiates tooth formation process during odontogenesis [2]. When inner and outer enamel epitheliums meet, Hertwig's epithelial root sheath is formed. This root sheath plays a crucial role in the root development process [3]. In molars, this sheath folds inward in order to create multiple roots. disruption in this folding can lead to various root anomalies. Root dilaceration, formation of additional roots, and concrescence are among these anomalies. Single-rooted primary molars are another outcome of failure in this sheath in inward folding [4,5].

The occurrence of single-rooted molars is generally observed in the permanent dentition, particularly in the second and third permanent molars [6]. Limited studies have reported cases of single-rooted primary molars. Root dysmorphology has been noted to have a higher prevalence in the mandibular arch and among females, and the incidence of single-rooted primary first molars is exceedingly rare [7]. According to previous studies, the presence of pyramidal single-rooted molars has a genetic origin, and this anomaly is inherited in an autosomal dominant manner [8].

Dental caries and trauma are among factors that can cause pulp involvement in primary teeth. Since primary teeth play an important role in function and maintenance of the arch length integrity, proper pulp treatment of these teeth is important [9]. Understanding the root canal morphology is essential for achieving successful pulp treatment in primary teeth [10]. This article presents a rare case of unilateral single-rooted primary first molars in two siblings.

Case

A 5-year-old female patient presented to the Pediatric Dentistry department, Dental School, Shahid Beheshti University of Medical Sciences, Tehran, Iran in April 2024. The chief complaint included dental caries and pain on the right side of her mouth while eating. The child had no previous dental treatment history and no history of systemic health problems. She had no syndromic complications and was classified as ASA I in terms of systemic health. Her parents were not relatives and reported no awareness of any dental anomalies in the family.

Upon general examination, the child had a normal build with height and weight appropriate for her age. In extra-oral examination, no significant asymmetry in the jaw and face and no sign of infection was observed. Upon intraoral examination, all primary teeth were present, and there was evidence of deep caries in the primary first and second molars on the right side of the mandibular arch.

A periapical radiograph using a bisect angle technique was obtained of these primary molars. The radiographic examination revealed that caries had progressed to the pulp in both primary molars. The primary first molar exhibited a single root with a single canal, while the second primary molar presented with a normal anatomical structure (Figure 1).

According to the Panoramic radiograph, this anomaly was unilateral and other teeth had a normal anatomy (Figure 2). Pulpotomy treatment and stainless-steel crown (SSC) placement were planned for the right mandibular primary first molar. Local anesthesia was achieved using a block technique on the inferior alveolar nerve with 2% lidocaine (epinephrine 1:80,000) (DarouPakhsh, Tehran, Iran) and 27- gauge long needle. After achieving isolation with cotton

rolls, caries removal was performed using a low-speed tungsten round #4 bur.

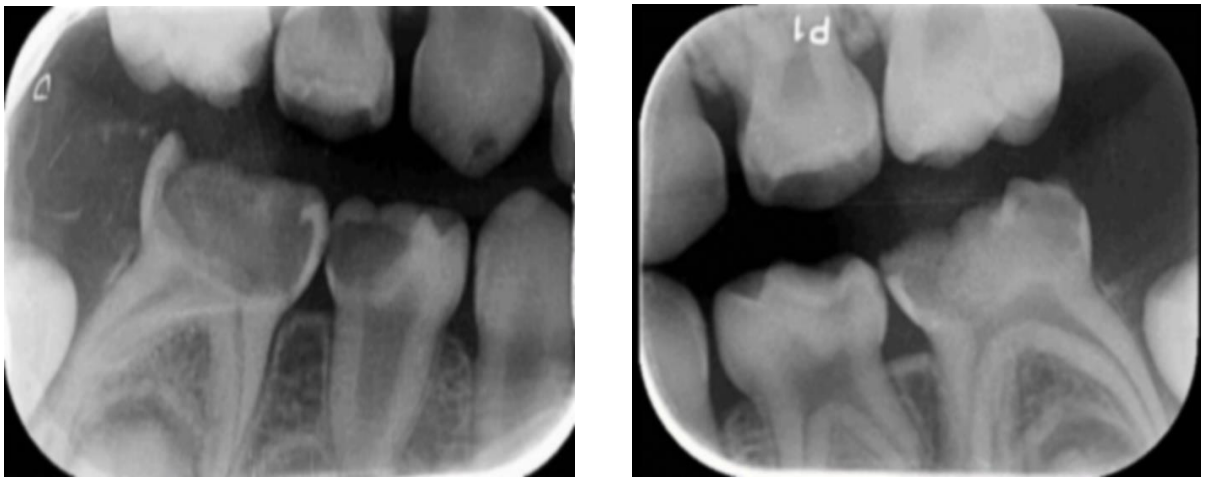

Figure 1: Pre-operative periapical radiographs of the right and left primary mandibular molars in a 5-year-old girl

Figure 2: The Panoramic view of the same patient

The roof of the pulp chamber was accessed with a #330 high-speed bur under water spray. After removing the coronal pulp with high-speed handpiece and excavator, only a single wide orifice was found. Root pulp excision and canal shaping were completed using hand files up to size 50. Canal irrigation was performed with normal saline followed by 2.5% sodium hypochlorite. The canal was then dried using paper points. Zinc oxide-eugenol (ZOE) paste (Morvabon, Tehran, Iran) was used for root canal filling with the help of a lentulo spiral, and the pulp chamber was filled with reinforced ZOE (Golchai, Karaj, Iran). Finally, a stainless-steel crown (Seil Global, South Korea) was placed on the tooth (Figure 3).

Figure 3: Post-operative periapical radiograph of the right mandibular primary first molar with a single root

After six months, the treated tooth had no symptoms of pain or abscess. Periapical radiograph showed normal appearance of bone and periodontium. No sign of periapical radiolucency or PDL widening was observed (Figure 4).

Figure 4: 6-month follow-up of the treated mandibular first molar

The child`s 4-year-old sister was examined for routine dental check-up. She had no history of past or present medical problems or syndromic complications and was classified as ASA Ⅰ in terms of systemic health. She had no history of prior dental treatment. She also had a normal appearance and build. facial examination showed no sign of asymmetry or infection. In Intraoral examination, all primary teeth were present and several dental caries were detected. Bitewing radiographs were taken, in which a single rooted primary first molar was detected on the left side of mandible (Figure 5).

A caries was detected at the distal side of this tooth. No pain was reported and the tooth did not present any sign of abscess. SSC restoration was planned for this tooth; however, the parents did not return for her dental treatment.

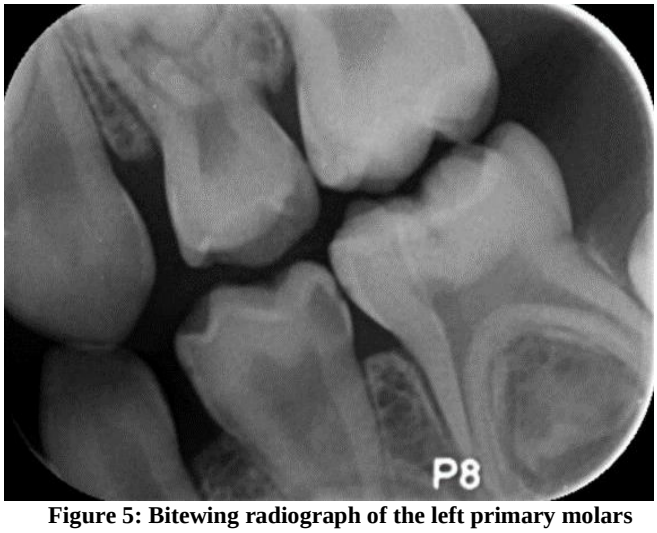

Figure 5: Bitewing radiograph of the left primary molars with a single rooted mandibular first primary molar observed in her 4-year-old sister

Discussion

Preserving primary teeth is an important goal in dentistry, since these teeth play a crucial role in speech, esthetics and arch length preservation [11].

Unilateral single-rooted primary molars are a rare anomaly, and their presence requires special considerations during treatment. This anomaly was first reported in 1973 by Ackerman et al. in a 10-year-old child [12]. The first documented case of a single-rooted primary molar in Iran was reported in Yazd in 2014 by Bahrololoomi et al.[10]

This manuscript presented cases of single-rooted primary first molars in two siblings, revealed in radiographic examinations. Previous researches have reported that single-rooted molars with pyramidal-shaped roots are inherited in an autosomal dominant manner. In humans, genes msx-1 and pax-9 have been reported to be associated with this anomaly [8]. In this case, single rooted primary first molar was observed in two sisters. This finding may align with previous evidence regarding the genetic origin of this trait.

The presence of a single root in primary molars necessitates specific considerations during pulp treatment. Given that pursuing additional canals during root canal therapy in single-rooted primary teeth can lead to excessive removal of dental tissue and iatrogenic complications such as perforations, a precise understanding of root morphology is crucial. Radiographs taken from two different angles prior to treatment can be beneficial in this regard [13,14].

To describe single-rooted molars, terms such as pyramidal, fused, and conical morphology have been utilized. The term "fused" is applied to molar teeth that possess conjoined roots but exhibit more than one canal. The term "pyramidal" is used for teeth that contain a single large canal within their sole root [12].

To date, there has been no report regarding abnormalities in the development of the successor teeth of single-rooted primary molars. Proper follow-up of these teeth can be valuable for evaluating the development of the permanent successor teeth.

Conclusion

Single-rooted primary molar is a rare incident; however, obtaining radiographs prior to the treatment is essential to diagnose and properly manage these cases.

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This article is a case report and doesn't have an ethical approval code.

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Using AI: AI was not used at any stage of writing this article.

Conflict of Interest: No conflicts of interest to declare.

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