

Primary Mandibular First Molar with Single Root and Single Canal: A Rare Morphology- A Report of Two Cases

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ABSTRACT

A rare developmental anomaly seen in the primary dentition is that of a primary mandibular molar with a single root. Various researches have revealed that due to the failure of invagination of Hertwig's epithelial root sheath, single root formation is seen. In order to have a successful root canal treatment, a pediatric dentist should have a proper knowledge of the morphology and anatomical variations of primary teeth. Here are two cases of primary mandibular first molar with a single root also known as pyramidal molar.

KEYWORDS: Molar; Dentition, Primary, Tooth Root

INTRODUCTION

The enamel dentin pulp and cementum is made of connective tissue which has an ectomesenchymal origin surrounded by bilayered mineralized tissues. Hertwig's epithelial root sheath (HERS) is formed by the inner and outer epithelium which constitute the basal layer of the epithelial dental organ. The continuous elongation of HERS causes root growth. HERS is responsible for determining the size, shape and number of radicular pulp.^{1,2} Various articles have reported that the cause of root dysmorphology is the failure of invagination of Hertwig's epithelial root sheath.^{2,3}

A successful root canal therapy in the primary dentition becomes a challenge when a multirrooted tooth presents with an anatomic variation.⁴

Various researchers have surveyed the anatomy of primary root canal and their findings are inconsistent.⁵ Bagherian and colleagues conducted a study in a sample of Iranian population and found that all deciduous mandibular first molars had two roots and two to four canals.⁶

These findings are in agreement with those of Gupta et al.⁷ and Hibbard et al.⁸

In order to assess the unusual morphology of root canals, multiple radiographs with different horizontal angulations can be used. Recently, computed tomography (CT) has been used to evaluate the three-dimensional anatomy of the teeth and root canal morphology.^{9,10}

Most commonly second and third permanent molars are seen to have single tapering root forms. Only four reported cases of single rooted primary molars have been

documented.¹¹⁻¹³ Females are seen to be more frequently affected than males with respect to root dysmorphology.⁴ The cause for this female predilection is unknown.¹⁴

CASE REPORT

Case Report 1: In February 2016, a seven-year-old girl was referred to the department. She presented with a chief complaint of pain in her left lower back tooth region for the past two months. Her medical history appeared noncontributory.

Clinical evaluation: Intraoral examination revealed all erupted primary teeth. Dental caries was found in left primary mandibular first and second molar.

Radiographic evaluation: Intraoral periapical radiographs of the decayed teeth were taken. It revealed caries involving the pulp in left primary mandibular first molar and caries was extending up to the dentin in the left mandibular second molar (Fig 1) While evaluating the



Fig 1: Pre operative radiograph showing radiolucency in single rooted left primary mandibular first molar involving pulp and radiolucency in second molar involving dentin

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root morphology right and left primary mandibular first molars had a single root (Fig 1 and Fig 2).

Treatment plan: Pulp therapy and stainless steel crowns for the left primary mandibular first molar was planned and restoration for left primary mandibular second molar.

Pulp therapy was done for the left primary mandibular first molar, but stainless steel crown could not be given as the parents were not keen about it. (Fig 3)



Fig 2: Pre operative radiograph showing taurodontism in single rooted right primary mandibular first molar involving pulp

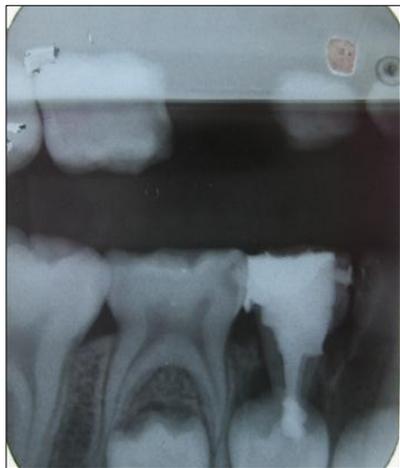


Fig 3: Pulpectomy treated left primary mandibular first molar with single root

Case Report 2: Another seven year old girl was referred to the department having a chief complaint of pain in her right lower back tooth region since one month. Her medical history was nonsignificant.

Clinical evaluation: Intraoral periapical radiographs of the right and left lower back teeth were taken. It revealed caries involving the pulp in the right and left primary mandibular first molar (Fig 4 and Fig 5). While evaluating the radiograph of the right and left primary mandibular first molars ,they were seen to have a single root.

Treatment plan: Pulp therapy followed by stainless steel crowns for right and left primary mandibular first molar was planned.

Pulp therapy was done for the right primary mandibular first molar (Fig 6) but pulp therapy for left primary mandibular first molar and stainless steel crowns for both the teeth could not be done as the parents did not want any further treatment.



Fig 4: Pre operative radiograph showing radiolucency in single rooted right primary mandibular first molar involving pulp



Fig 5: Pre operative radiograph showing radiolucency involving pulp single rooted left primary mandibular first molar involving pulp

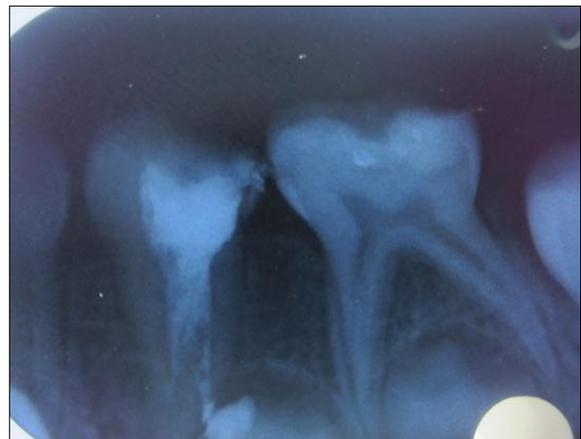


Fig 6: Pulpectomy treated right primary mandibular first molar with single root

DISCUSSION

Only one study about this rare phenomenon was found after Ackerman et al. and Gideon et al. reported the first cases of single rooted primary molars in children.² Bagherian et al. stated that all deciduous mandibular first molars had two roots and two to four root canals in a sample of Iranian population. They also observed the

presence of a single broad buccolingual canal in each root of the mandibular primary molars, especially in the distal root.⁶ However, they did not find any single rooted primary mandibular first molar. Regarding the study conducted by Barker et al., single and wide root canals of deciduous mandibular first molars were usually broad¹⁵, but continuous deposition of secondary dentin led to complete or partially separated canals with horizontal anastomosis.^{7,15}

Literatures suggested that due to an autosomal dominant condition, single pyramidal shaped root in molars were inherited.¹⁶ These case reports describe two children with decayed bilateral single rooted primary mandibular first molars with no report of any previous family history. On the basis of genetic transmission, the reason for the occurrence of these dental findings could not be substantiated as no relevant family history could be found.

Various factors need to be considered before endodontically treating a single rooted primary molars. The most common iatrogenic access opening errors have been found to be excessive tooth removal and perforation which usually occur during the search for the extra canals in teeth with unusual root morphology.¹⁷ A thorough knowledge of the general location and dimension of the pulp chamber will help the clinician in minimising such errors.¹⁷ A preoperative radiograph and an additional radiographic view from a 20-degree mesial and distal projection helps to detect any abnormalities in root canal morphology.¹⁸

CONCLUSION

The knowledge of anatomic characteristics and their possible variation is essential. Examination of clear radiographs taken from different angles and careful evaluation of the internal anatomy of teeth are essential for successful treatment. Knowledge of unfamiliar variations like the case discussed is important as a nontreatment of one additional root or root canal can lead to failure of root canal procedures.

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