Three-rooted mandibular first primary molar: Report of three cases

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Abstract

Accessory root formation in primary teeth is an uncommon finding. An awareness and understanding of the presence of additional roots and unusual root canal morphology is essential as it determines the successful outcome of the endodontic treatment. This paper presents three case reports on the presence of three-rooted mandibular first primary molar (primary three-rooted mandibular left first molar and bilateral mandibular first molar).

Keywords: accessory root formation; dental anomalies; mandibular first primary molar; three-rooted mandibular

Introduction

Knowledge of tooth and root canal anatomy is important for dental practice and for identifying features of anthropologic significance.[1,2]

The prevalence of dental anomalies is lower in the primary dentition than in the permanent dentition.[3,4] Tratman[5] found that three-rooted mandibular molars were rare (frequency < 1%) in the primary dentition and common in the permanent dentition (9% among Malay individuals and 11% among Javanese individuals).

An awareness and understanding of the presence of additional roots and unusual root canal morphology is essential as it determines the successful outcome of endodontic treatment. In spite of all procedural protocol if clinician’s miss an additional root or canals it could pose a great challenge and lead to failure of endodontic treatment.

Anatomic characteristic of primary mandibular first molar is generally described as a group of teeth with two roots, one mesial, and one distal. An accessory root formation in primary teeth is quite an uncommon finding.[6]

The following case reports describe the presence of an additional root in mandibular first primary molar in three cases.

Case Reports

Case 1

A 7½-year-old patient was referred to the Department of Pedodontics and Preventive Dentistry, Hitkarini Dental College and Hospital, Jabalpur, with chief complaint of “acute pain in his left lower back tooth.” The patient’s medical history was noncontributory. On clinical examination, there was gross decay in the mandibular left first primary molar (tooth 74), which was tender to percussion. The tooth was not mobile. The preoperative diagnostic radiograph revealed an occlusal radiolucency, approaching the pulp space and presence of an additional root in 74 [Figure 1].

From the clinical and radiographic findings, a diagnosis of symptomatic irreversible pulpitis was made for the tooth 74, and pulpectomy was scheduled.

Following local anesthesia with 2% lignocaine containing 1:200 000 epinephrine (xylocaine; AstraZeneca Pharma Ind Ltd, Bangalore, India), an endodontic access cavity was prepared under rubber dam isolation on tooth 74.

Figure 1: Preoperative periapical radiograph shows primary three-rooted mandibular left first molar (74) for case 1
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The conventional rectangular access was modified to a trapezoidal shape to improve access to additional canal.

After removing the coronal pulp and probing with a DG 16 endodontic explorer, in addition to two root canal orifices mesial, distal, a third small hemorrhagic point were located midway buccally.

The working length was determined by superimposing endodontic files over the preoperative radiograph and keeping it 1–2 mm short of radiograph apex [Figure 2].

The cleaning and shaping of the canals were carried out using Hedstroem files (21 mm) up to a maximum size of no. 30. Irrigation with sodium hypochlorite (2.6%) and normal saline was continuously done throughout the instrumentation. The canals were then dried with absorbent paper points (Dentsply Tulsa, Tulsa, USA).

The root canals were then obturated with Metapex (Calcium hydroxide iodoform paste). The access cavity was sealed with a fast setting Zinc Oxide Eugenol paste and an immediate postoperative intra oral periapical x-ray was recorded [Figure 3].

Case 2
A 4-year-old boy reported to Department of Pedodontics and Preventive Dentistry with chief complain of decay in both the lower back tooth. Medical history was non-contributory. Periapical radiographs revealed an occlusal radiolucency approaching pulp space and revealed bilateral three-rooted mandibular first molar, 74 and 84 [Figures 4 and 5].

From the clinical and radiographic findings, a diagnosis of symptomatic irreversible pulpitis was made for the tooth 74 and 84, and pulpectomy was scheduled.

The same procedure was followed as described in case 1. The root canals of both the tooth (74, 84) were obturated with Metapex (calcium hydroxide iodoform paste) and an immediate post–operative intraoral periapical radiograph was recorded [Figures 6 and 7].

Discussion
Root canal variations occur commonly, and it is imperative that the dentist identifies and manages these variations. There have been several reports on the occurrence of three rooted permanent mandibular first molar and primary
mandibular second molar anomalies. But there are very few reports on the variations in the number of roots that occur in the primary mandibular first molar.[6-8]

Badger[7] reported a case of unilateral three-rooted primary mandibular first molars in a 5-year-old Caucasian boy. Falk and Bowers[6] reported a case of bilateral three-rooted primary mandibular first molars in a 10-year-old Western European male. Winkler and Ahmad[8] reported three case reports including one case of primary bifurcated maxillary left canine, second case on primary three rooted mandibular right first molar and third case on bilateral primary three rooted mandibular first and second molars of Native Americans.

So, while performing endodontic therapy in primary teeth, the clinician should be aware of the possibility of an anomalous root. During exodontic procedures, the clinician should make sure that the crown of the premolar is not trapped in the interradicular area of the primary teeth as this could cause accidental removal of the developing permanent tooth. The clinician also should inspect extracted anomalous primary teeth to ensure that all roots have been retrieved. Since it is not known whether these abnormal root configurations affect the normal exfoliation of the primary teeth, it is unclear whether these anomalous teeth present orthodontic problems. The presence of a third root, whether primary or permanent, may have forensic value for identifying people of the Mongoloid race.

### Conclusion

The variation in root or root canal morphology is challenging for diagnosis and successful endodontic therapy. Knowledge of unknown variation like the case discussed is essential as non treatment of one additional root or root canal can lead to failure of endodontic treatment.

The significance of this root anomaly may seem to be academic; however; pulpal treatment or extractions of teeth with anomalous root configuration or number may pose clinical difficulties especially when they are not anticipated.

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