CASE REPORT

Unilateral single-rooted primary mandibular first molar

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SUMMARY

A 4-year-old boy reported food lodgement and pain in the lower left back tooth region. On examination, a deeply carious tooth with food lodgement was seen. On oral examination, numbers of teeth were found to be carious and required restorations and endodontic treatments according to radiographic evaluation. Radiograph of mandibular left first deciduous molar revealed an unusual morphology of root. It was single-rooted and presented with Vertucci's class I canal. The tooth was treated by pulpectomy followed by a stainless steel crown. All other carious teeth were treated as planned.

BACKGROUND

Variations in normal tooth structures occur during different stages of tooth development. In a deciduous tooth, root formation completes within 2–3 years following physiological tooth eruption.¹ Morphological dental anomalies with respect to roots may involve a single tooth, a group of teeth or the entire dentition.¹

It is necessary to know the number of roots and their morphology before starting any endodontic treatment. Generally anatomical configuration of mandibular molars is two roots, one mesial and one distal and most commonly one distal and two mesial root canals are found.²

Gupta and Grewal³ reported 100% of mesio buccal and distal canals and 93.3% of mesio lingual canals were reported in two roots of mandibular primary molars. A single root with a single root canal is rare finding in primary molars. A single root is attributed to the fusion of roots or deep taurodontism. These roots are also termed as 'pyramidal', 'cuneiform', 'tubular', 'cylindrical', 'prismatic' and 'conical'. Investigators agree that

Figure 2 Preoperative intraoral periapical radiograph of primary left mandibular molar region in which first molar have revealed an unusual anatomy.

this variation in root form results from the failure of invagination of Hertwig's epithelial root sheath.⁴

According to Vertucci, root canals are classified into eight main categories.⁵ Class I is single root with single canal and single apical foramen which is rare finding in molars. The following case reports this rare finding in primary left mandibular first molar to add new information to the existing literature.

CASE PRESENTATION

A 4-year-old boy reported food lodgement and intermittent pain in tooth in lower left back region of jaw. There was a history of trauma with fractured upper anterior tooth and food lodgement in various teeth. No relevant medical, dental and family histories were found.

During intraoral examination, class I fracture (Garcia Godoy's) in the primary maxillary left central incisor was seen.⁶ Dental caries in the primary maxillary right canine, the primary

Figure 1 Class I fracture (Garcia Godoy's) in primary left maxillary central incisor and dental caries in primary maxillary and mandibular teeth.

Figure 3 Oral prophylaxis, restorations, endodontic procedures followed by stainless steel crowns in maxilla and mandibular teeth.

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Figure 4 Postoperative intraoral periapical radiograph of the primary left mandibular molar region.

maxillary right and left first and second molar, primary mandibular right and left first and second molar were observed (figure 1).

INVESTIGATIONS

Intraoral periapical radiograph of primary left mandibular first molar revealed an unusual anatomy. It was a class I type of root canal according to Vertucci's classification.⁵ Other primary molars were found to have normal anatomy (figure 2).

TREATMENT

Full mouth rehabilitation of the patient was planned. Oral hygiene instructions were given. Oral prophylaxis and restorations were performed. Endodontic treatment was carried out in the primary mandibular right first molar, mandibular left first and second molars followed by stainless steel crowns (figure 3). Postoperative intraoral periapical radiograph of primary mandibular left molar region was taken (figure 4).

OUTCOME AND FOLLOW-UP

The patient is kept on observation for further examination of the permanent molars. Every 6-month follow-up was advised to prevent development of new carious lesion and provided preventive treatment to protect his teeth.

DISCUSSION

The most commonly observed variation of tooth morphology is confluence of molar roots into one, which may be commonly observed in the permanent third molar but rarely in the deciduous first molar. These root canal configurations can be classified using Vertucci's classification.⁵ Single-rooted molars with Vertucci's class I root canal is a rare finding among primary teeth.⁵

Unilateral single-rooted primary mandibular molar tooth is a very rare incidence. According to a study by Naser *et al*⁷ 79.2%

deciduous first molars have three roots and 20.8% have rather four or five canals.^{7 8}

Various methods can be used to investigate the anatomy of root canals. These include direct observation with the aid of a microscope,⁹ macroscopic sections,⁸ filling of canals with inert materials followed by decalcification¹⁰ and filling of canals and clearing¹¹ most of these methods are considered after the extraction of teeth. Conventional radiography has various constraints such as overlapping structures, radiographic artefacts which obscure the object of interest.¹² CT is a good method of studying the morphology of root, but the cost of the test makes it affordable to few patients. In such cases, the reported literature always adds up to the knowledge of a clinician and helps them to diagnose. Investigators suggested that single pyramidal-shaped root in molars were inherited as an autosomal dominant condition.¹³

An in-depth analysis of similar dental anomalies was first reported by Robbins and Keene in 1964.¹ Ackerman reported kindred with root formation anomalies and described a 10-year-old boy with pyramidal roots in all primary molars. The report also discussed a group of dental and other abnormalities that occurred in three generations of the family of English and German descent. These abnormalities included skin manifestations such as a lack of the 'cupids bow' and widening of the philtrum, clinodactyly of the fingers, and juvenile type glaucoma.¹⁴

Holan *et al*¹³ in 1991 reported single-rooted primary and permanent molars in two siblings. Manoj Kumar *et al*¹⁵ in 2010 reported multiple conical single-rooted permanent and primary teeth with oligodontia in a 11-year-old boy. Ganesh *et al*¹⁶ in 2012 reported a case of bilateral single-rooted primary molar (table 1).

All the cases aforementioned either had genetic association or syndrome-related anomalies and at least more than one tooth involved. In this case, there was no syndrome related to the condition. Genetic correlation could not be confirmed and only one tooth has this type of anomaly.

In short, to render the best endodontic service to the patients, the dentist must have a thorough knowledge of root canal anatomy and their variations. If knowledge of dental anatomy is insufficient then it may lead to some procedural defects during endodontic treatment and may cause an endodontic emergency to arise. So, this article reported a rare variation of unilateral single-rooted primary first molar and its endodontic treatment.

Although there is no reported literature regarding any further complications of such teeth. No literature stated any kind of impaction, structural anomalies or delay in eruption of successors of such teeth. We are trying to determine the differential rate of resorption in single-rooted molars and other multirooted molars in the same case. This case report brings to light untold facts of dentistry.

Table 1 Cases of single-rooted primary molars reported

Author	Year	Number of cases	Description of root anomaly	Quadrants of affected tooth
Ackerman <i>et al</i> ⁴	1973	One	Single-rooted primary molars	All four
Holan <i>et al</i> ¹³	1991	Two	Single-rooted primary molars and permanent molars	All four
Manoj Kumar <i>et al</i> ¹⁵	2010	One	Single-rooted primary molars and permanent molars	All four
Ganesh <i>et al</i> ¹⁶	2012	One	Single-rooted primary molars	Third and fourth

Learning points

- Knowledge of dental anatomy can facilitate more effective canal identification.
- To identify and recognise canal configuration is very important.
- Prevent unnecessary removal of healthy tooth structure in an attempt to search for missing canals.

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Competing interests None.

Patient consent Obtained.

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