



CASE SERIES OF THREE ROOTED PRIMARY MANDIBULAR FIRST MOLARS AND THEIR MANAGEMENT.

Dental Science

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ABSTRACT

Anatomic variation in the radicular morphology is a common developmental abnormality. It is usually seen as an additional number of roots and root canals. However, these anomalies are rarely seen in primary mandibular first molar. In order to determine the success of any dental treatment, thorough knowledge of anatomical variations and correct diagnosis of prevailing conditions of the affected tooth/teeth is a prerequisite. This paper presents case series of three rare case reports of three-rooted primary mandibular first molars and their management.

KEYWORDS

Accessory root, primary mandibular molar, endodontic treatment, developmental anomalies

INTRODUCTION:

Additional/accessory roots are a rare finding in primary dentition¹. Dental literature has limited reports of primary multi-rooted tooth anomalies.^{2,3} Reports suggest that three rooted mandibular molars are rarer in primary dentition compared to permanent dentition and are rarer in mandibular primary first molars with a frequency of < 1%.⁴

Awareness and knowledge of the anatomy of human teeth and its variations are very important as it determines the successful outcome of exodontic or endodontic procedures. Failure of therapy may result if the presence of a three-rooted anomaly is not recognized.

This paper presents interesting and rare three case reports of three-rooted primary mandibular first molars. The conditions were diagnosed based on clinical and radiographic findings.

CASE REPORTS

Case I

A 4½-year-old girl was referred to the Department of Pedodontics and Preventive Dentistry, I.T.S Dental College Hospital and Research Centre, Greater Noida with a chief complaint of pain in the lower right back tooth region. Medical and dental histories were non-significant. On clinical examination, there was gross decay in the primary mandibular right first molar (tooth 84) which was tender on percussion. Intraoral periapical radiograph (IOPA) revealed an occlusal radiolucency involving the pulp space. The radiograph also revealed the presence of an accessory root with relation to 84. [Figure 1]

From the clinical and radiographic findings, a diagnosis of symptomatic irreversible pulpitis was made for the tooth 84 and pulpectomy followed by stainless steel crown placement in relation to 84 was planned.

Following local anesthesia with 2% lignocaine containing 1: 2, 00,000 epinephrine (Neon Laboratory Limited, Mumbai, India), an access cavity was prepared on tooth 84. After removing the coronal pulp, chemomechanical preparation of the canals were carried out. The canals were then dried with absorbent paper points and the root canals

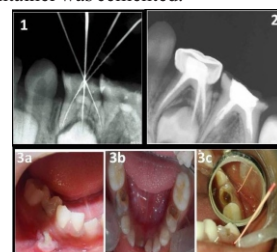
were obturated with Metapex (Meta Biomed Co.Ltd. Korea.The access cavity was then sealed with Glass Ionomer Cement (Ketac TM Molar, Germany). On the following appointment a stainless steel crown was placed [Figure 2].

Case II

A 5 year-old male patient was referred to the Department of Pedodontics and Preventive Dentistry with a chief complaint of ulcer near the lower right back tooth region. His medical and dental histories were not significant. On clinical examination, there was an ulcer in the buccal vestibule in relation to the primary mandibular right first molar (tooth 84) with fenestration [Figure 3a]. Both primary mandibular left and right first molar (tooth 74 and 84) were grossly decayed [Figure 3b]. Sinus opening was also seen in relation to 74 [Figure 3c]. IOPA was advised for 74 and 84, which revealed radiolucency involving the pulp. Furcation involvement in relation to 74 and 84 could also be seen. Interestingly, radiographic examination also revealed that the lower right and left first primary molars (74 and 84) had three accessory roots. [Figure 4a, 4b]

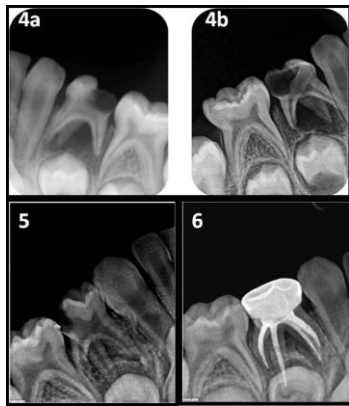
From the clinical and radiographic findings, a diagnosis of chronic irreversible pulpitis was made with respect to 74 and 84. Due to poor prognosis, extraction followed by provision of space maintainer was planned.

Following local anesthesia with 2% lignocaine containing 1: 2, 00,000 epinephrine (LOX 2% Adrenaline 1:200000, Neon Laboratory Limited, Mumbai, India) extraction of 84 and 74 was done and band and loop space maintainer was cemented.



CASE III

A 4-year-old girl reported to Department of Pedodontics and Preventive Dentistry with a chief complaint of pain in the lower left back tooth region. Medical and dental histories were non-significant. On clinical examination, there was gross decay in the primary mandibular left first molar (tooth 74). Periapical radiographs revealed an occlusal radiolucency involving the pulp space. Presences of three roots were also seen in relation to 74. [Figure 5]



From the clinical and radiographic findings, a diagnosis of symptomatic irreversible pulpitis with relation to 74 was made. Pulpectomy followed by stainless steel crown placement in relation to 74 was planned. Pulpectomy procedure was carried out as described above. [Figure 6]

DISCUSSION

Presences of accessory root/s have become a major concern in dental practice. Many reports are documented in the literature regarding multi-rooted primary and permanent mandibular molars and their various treatment modalities; only a few of them describe the presence of extra root in primary first mandibular molar.⁵⁻⁷

Development of the accessory root may be the result of disturbance in the Hertwig's epithelial root sheath (HERS). Due to this disturbance, HERS may split to form two similar roots or it may fold to form an independent root which may present with various morphological features.⁸ Throughout the course of root development, any disturbance in the HERS may leads to the formation of accessory root/s.⁹ Even though several factors which include local traumatic injuries, external pressure, genetic factors, different ethnic groups, some diseases and metabolic dysfunction during root development have been proposed as the etiological factor for the formation of accessory root, the exact cause is still remains uncertain.¹⁰⁻¹²

The incidence of three rooted permanent mandibular molar ranges from 15.2% in Mongolian population to 6.8 % in Caucasian population. Song JS et. al.¹³ reported a prevalence of 33.1 % of additional roots in first permanent molar. However the prevalence of dental anomalies in primary dentition is low with a frequency of less than 1 % as reported by Tratman⁴. Srikanth conducted a retrospective analysis for the presence of three roots in deciduous first and second molars and found a prevalence of 5.6% in Indian population.¹⁴ The reports on multi-rooted primary mandibular second molar are more in number as compared to primary first molar which has a prevalence rate of 9.7%. The prevalence of additional root in primary second molar is higher with a prevalence rate of 27.8%.¹³

Reports suggest that the probability of the posterior adjacent molar having an additional root was greater than 94.3%, if an additional root was present in primary molar.¹³ This can be explained through Field development theory.¹⁵ However in our cases, we could not find any accessory root in the second primary molar. The roots of first permanent mandibular molar were in developing stage so their presence of extra root could not be appreciated.

There are also racial differences in the prevalence of three rooted permanent mandibular molars with maximum prevalence in Mongolian origin and least in Negro and Caucasian population.¹⁶

From the data available, additional roots can be present unilaterally or bilaterally with higher prevalence for unilateral distribution.^{17,18} This

article report three cases of three rooted first primary mandibular molars out of which two cases show presence of three-rooted mandibular molar unilaterally and one bilaterally. Out of the three cases reported, two cases were male and one was female.

The dimension of the accessory root may have a variable shape ranging from a short conical extension to a mature full length root with pulp extending into it.¹⁹ In this present report, the accessory root in case I was almost of same length, case II shorter bilaterally and case III a longer accessory root.

The prevalence of multi-rooted teeth in primary dentition is assumed to be low because of the lack of documentation in the literature. This may be due to limited time between root formation and resorption when radiography may reveal their presence and in many cases where teeth are extracted, root resorption may have already removed the evidence. Moreover the conventional radiograph has limitation of showing three dimensional objects in two dimensions which gives an image with superimposition thus reducing its diagnostic value.

It is important to rule out the presence of extra-root teeth during treatment procedure. If not diagnosed properly, the clinician may miss the presence of an accessory root during endodontic procedure which may lead to endodontic failure. Accidental removal of the developing permanent tooth may result during exodontic procedure as succedaneous premolars may be trapped between the roots. Failure to retrieve the root fragments may cause the permanent succedaneous tooth to deviate from its normal path of eruption.²⁰

This can be prevented if the diagnostic procedure is carried out properly. It has been suggested that on clinical inspection of the tooth crown presence an extra cusp or bulge may raise a doubt for the presence of an accessory root.²¹ However in our cases the crowns were grossly decayed so could not aid in our diagnosis. If in doubt, two radiographs from different angle may be taken to reveal the superimposed accessory root. Newer radiographic modalities like radiovisiography and spiral CT may be helpful in diagnosing such anomalies. A thorough knowledge about the prevalence, racial distribution, anatomy of the accessory root and modification in treatment plan is necessary for the successful outcome of treatment.

CONCLUSION

Three rooted primary mandibular molars are assumed to be rare because of lack of documentation in the literature. However, their occurrence necessitates efforts by the clinicians to take routine radiographs. Further studies are required to document the prevalence of such anomalies and also those clinicians who encounter such rare anomalies should make an effort to document them so as to establish accurate prevalence data to elucidate any potential treatment ramifications.

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