CASE REPORT

Missed canal...call from radix entomolaris

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SUMMARY

A comprehensive understanding of root and root canal morphology of primary teeth is valuable for successful endodontic therapy. A supernumerary root is a developmental anomaly which can affect any tooth. An extra root placed lingually (radix entomolaris) or buccally (radix paramolaris) can be seen in mandibular molars nonetheless; bilateral association of an additional root in deciduous mandibular molars is rare. This report aimed to describe the diagnosis, significance and management of an extra root in deciduous mandibular molars bilaterally in perspective of modern clinical paediatric endodontics.

BACKGROUND

A comprehensive understanding of the morphology of the root canal structure is imperative for successful endodontic therapy. A missed root canal may provide a nidus for infection ultimately failing endodontic treatment. A supernumerary root is a developmental anomaly which can affect any tooth. 'Radix entomolaris' (RE), an additional third root, was first described by Carabelli¹ and is also described as an 'extra distolingual root' or a 'distolingual root' or an 'extra third root'.² RE can be a short conical extension or a mature root of the usual length.³

An aetiology for the development of RE is obscure. In dysmorphic extra roots, aetiology could be associated with external factors during odontogenesis, or with penetrance of an atavistic gene or polygenetic system, but in eumorphic roots, racial genetic factors cause profound expression of a particular gene, which results in more evident phenotypic manifestation.^{2 4 5}

Root variations are less prevalent in the deciduous dentition than in the permanent dentition.⁶ Song *et al*⁷ reported the prevalence of a supernumerary root in the deciduous mandibular first and second molars at 9.7% and 27.8%, respectively. Garg *et al*⁸ have observed a 5% prevalence of three-rooted permanent mandibular first molars in Indian adults.

Bizarre patterns of root canals should be understood by all dentists throughout the globe because with technological advancements the world is getting closure with increased chances to see patients from distant races and ethnic backgrounds.

There are fewer case reports on the existence of three-rooted deciduous mandibular molars⁹ nevertheless; bilateral association of an additional root in deciduous mandibular first molars is rare.^{10 11} So, this report aims to describe the morphology, diagnosis, implication and management of the supernumerary root in deciduous mandibular first and second molars bilaterally in perspective of modern clinical paediatric endodontics.

CASE PRESENTATION

A five-year-old girl reported to the department of pedodontics, Bharati Vidyapeeth Deemed University Dental College and Hospital, Sangli, Maharashtra, India, with a chief symptom of pain in relation to carious molars and chewing problems. The child was born to non-consanguineous parents. The mother stated that in the prenatal period she did not have any intake of medication and the delivery was full term, normal. The family history was unremarkable regarding teeth anomaly. Intraoral examination revealed caries involving enamel, dentin approaching pulp of 74, 84 and occlusal caries involving enamel, dentin of 75, 85 (figure 1A,B).

INVESTIGATIONS

Preoperative intraoral periapical (IOPA) X-rays of 74, 75, 84 and 85 revealed no extra roots (figure 1C,D).

DIFFERENTIAL DIAGNOSIS

74 and 84 were provisionally diagnosed as chronic irreversible pulpitis; hence, an endodontic procedure was planned.

TREATMENT

The importance of preventive measures and regular follow-up was stressed to the child and the parents.

Figure 1 (A) preoperative photograph 84 and 85; (B) preoperative photograph 74 and 75; (C) preoperative radiograph 74 and (D) preoperative X-ray 84.

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Figure 2 (A) 84 Access cavity and (B) 84 files in position.

The tell-show-do technique was used during treatment. A strict protocol of sterilisation was followed. After isolating 74 and 84 with rubber dam, all caries were excavated and an access cavity was made under local anaesthesia. An extra canal with an unusual dentinal map was observed; orifices were not located centrally in the mesial and distal roots ([figure 2A](#)). Canals were explored using a size 10 H file and pulp extirpated with debridement ([figure 2B](#)). A radiographic study of 74, 84 using 20° from the mesial projection was performed ([figure 3](#)). It showed four canals (2 mesial and 2 distal) in three roots. Working length was determined and obturation was performed with Vitapex ([figure 4](#)). To verify the root canal aberrations, CT imaging was performed which clearly confirmed that all mandibular deciduous molars in the present case had three roots and four canals bilaterally, which is a rare finding ([figure 5](#)). 74, 75, 84 and 85 were restored with glass ionomer cement followed by 3M preformed stainless steel crowns cementation on 74 and 84 ([figure 6](#)).

OUTCOME AND FOLLOW-UP

Recall was advised after every 6 months to assess the success of the pulpectomy procedure in radix entomolaris cases.

Figure 3 Intraoral X-ray of 84 and 74 with 20° mesial projection.

Figure 4 Postoperative intraoral radiograph 84 and 74.

DISCUSSION

The facts of normal and unusual anatomy of primary molars can affect the success and prognosis of endodontic therapy. The IOPA X-ray gives a gross understanding of root canals because the root canals have three dimensions.¹² It is impractical to see the buccolingual aspect on IOPA, because of the superimposition of tissues such as dentin, cementum and cancellous and cortical bone of the alveolar process.¹² An unclear view or outline of the root contour or the root canal on IOPA can suggest the occurrence of a hidden extra root. Two IOPA X-rays taken at altered horizontal angulations may help to recognise the supernumerary root.

Therefore, whenever there is uncertainty regarding the morphology and number of root canals, an advanced technique such as CT scan can be used. A non-invasive three-dimensional reconstruction image can be achieved using cone-beam CT (CBCT).⁴ CT scan allows the observation of the morphology of the root canals, the roots and the appearance of the tooth in every direction. Besides that, the image can also be analysed, altered and reconstructed by the computer.¹³

In the present case, one supernumerary root, viz, distolingual in the deciduous mandibular first and second molars, was seen bilaterally. The conventional triangular access cavity opening

Figure 5 (A and B) CT of the mandible—coronal section showing 74, 75, 84 and 85.

Figure 6 Postoperative photograph.

was customised to trapezoid or rectangular form to find the orifice of the supernumerary root. Various techniques to locate the orifice of the supernumerary root, such as the law of orifice location, law of symmetry, tactile sensation using the path finder, endodontic explorer, DG 16 probe and micro-opener, surgical loupes, use of fibre-optic illumination dental endoscopy, operating microscope, intraoral camera, MR microscopy and microCT, can be used.³

Learning points

- Understanding the clinical implications of root canal morphological variations helps in improving the success rate in endodontic treatment.
- A modified clinical approach using CT scan can be an adjunct to intraoral periapical for diagnosis of diverse morphology of root canals in deciduous teeth.
- Cone-beam CT may be a supportive diagnostic tool in the dentist's arsenal for precision of endodontic therapy.

The dentist should be sceptical while extracting the primary molar with accessory root because complications like root fracture, trauma to developing a premolar tooth bud or its inadvertent removal may happen.

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Competing interests None.

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