Endodontic management of radix entomolaris- Two case reports

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Abstract

The occurrence of an additional root located lingually and buccally in Mandibular Molars called radix entomolaris and radix paramolaris respectively which is not rare. when encountered, the successful outcome of root canal treatment is coutributed by an awareness and understanding of this unusual root and its root canal morphology. Case report of mandibular first molar and mandibular third molar with three roots (one mesial and two distal) and four canals (two in mesial and two in distal root) is described in this paper. Anatomic variation of internal morphology of the tooth are displayed in this paper and importance of searching for additional canals is specified.

Introduction

The aim of a practitioner while performing root canal treatment is to establish an entire pulpal space that is free from any pathos is by means of a chemo-mechanical preparation in the pulpal space,which is usually followed by a biocompatible filling material.[1] Various hindrances can complicate achiving the optimum treatment if not rendering the treatment unsuccessful. Few examples of such factors are presence of variation of morphology, such as multiple roots and accessory canals, dense in dent, taurodontism, and radix entomolaris and extreme long roots.[2]

The greater number of mandibular first molars are two rooted with one mesial root and one distal root.[3] Though variations are seen in number, location of roots and root canals of these teeth. An additional third root in mandibular molar is termed as Radix Entomolaris (RE) and was first mentioned in the literature by Carabelli.[T]he supernumerary root is located distolingual to the mesial root of the mandibular molars in RE. Whereas additional root at the mesiobuccal side of the distal root of the mandibular molar is termed as the Radix Paramolaris (RP). [5]

Occurence of these three-rooted mandibular first molars appears to be less than 3% in African populations, not to exceed 4.2% in Caucasians, to be less than 5% in Eurasian and Asian populations, and to be higher than 5% (even up to 40%) in populations with Mongolian traits and 5.97% in Indian population.[6]The success of root canal treatment is highly contributed by awareness and understanding of the presence of unusual root canal morphology .[6]

This report converses about endodontic treatment of three rooted mandibular first and third molars with Radix Entomolaris.

Case report 1

In Saraswati Dhanwantari Dental College And Hospital, Parbhani,a 18 year old female patient reported to the Department of Conservative Dentistry and Endodontics, with a complaint of pain in lower left back tooth since last 5 days. The nature of pain was spontaneous, sharp continuous which aggravates while eating and elieved with medication for some time.Radiolucency involving enamel, dentin and pulp was seen with relation to 36 on Intra oral periapical radiograph examination. Vitality testing showed positive response,as well as tenderness on percussion was seen.The additional distolingual root was showed in the radiograph. Diagnosis of acute irreversible pulpitis was made and root canal treatment was advised.

Local anaesthesia (inferior alveolar nerve block) was performed. The access cavity was prepared with distolingual extension to provide proper access to distolingual canal after isolating the tooth with rubber dam. Canal orifices were located, and a radiograph was taken to determine the working length of the canals with two instruments each in mesial root and the distal root (fig 1) .

Rotary pro-taper files were used in Cleaning and shaping in crown down manner. Apical preparation was done till size F2 protaper file (master apical file). The canals were irrigated with 5.25% sodium hypochlorite, 0.2% chlorhexidine gluconate during instrumentation and finally with normal saline. During preparation, RC Help (17% EDTA) was used as a lubricant. The canals were then dried with paper points, master cone selection radiograph was taken,(Fig. 2) and obturated with laterally condensed gutta percha and AH plus sealer (Fig. 3).

Fig 1- Access Opening

Fig 2- Working length determination

Fig 3- Master cone selection

Fig 4- Obturation

Case report 2

A 30-year-old female patient was referred to the Department of Conservative Dentistry and Endodontics. Saraswati Dhanwantari Dental College And Hospital, Parbhani,A 30-year-old female patient was referred to the Department of Conservative Dentistry and Endodontics with the complaint of pain in the lower left back tooth region.History of intermittent pain for the past one month, which aggravated on chewing food was reported by patient.Clinical examination revels acarious mandibular left third molar,which is tender on percussion. Electric pulp test responce was negative. Diagnostic radiography showed a coronal radiolucent area involving the pulp and ill-defined radiolucency at the periapex of distal root.The tooth was diagnosed with symptomatic irreversible pulpitis and apical periodontitis based on findings. Endodontic management was planned for the involved tooth.

local anaesthesia (inferior alveolar nerve block) was performed. After isolation with rubber dam,the access cavity was prepared with distolingual extension to provide proper access to distolingual canal. Canal orifices were located, and a radiograph was taken to determine the working length of the canals with two instruments each in mesial root and distal root (fig 5) . Pro-taper files were used in Cleaning and shaping in crown down manner. Apical preparation was done till size F2 protaper file (master apical file). The canals were irrigated with 5.25% sodium hypochlorite, 0.2% chlorhexidine gluconate during instrumentation and finally with normal saline. During preparation, RC Help(17% EDTA) was used as a lubricant. The canals were then dried with paper points, master cone selection radiograph was taken,(Fig. 6) and obturated with laterally condensed gutta percha and AH plus sealer (Fig. 7).

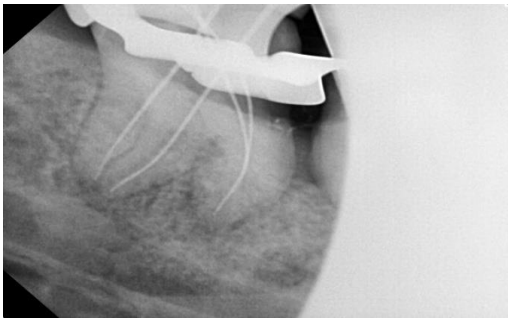

Fig 5- working length

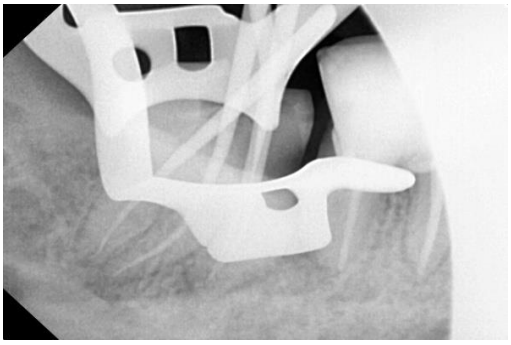

Fig 6- master cone selection

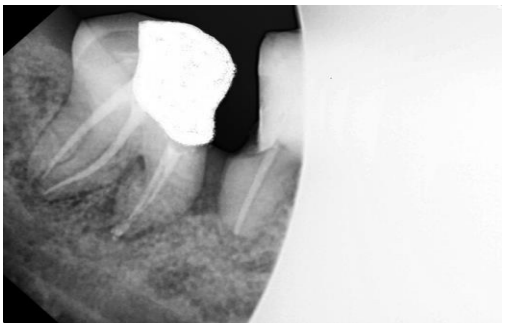

Fig 7- Obturation

Discussion

The thorough knowledge of root canal morphology and the configuration of the teeth played an important role in the success of endodontic therapy. Radix entomolaris and Radix paramolaris can be seen most commonly in the first, second and third mandibular molar, occurring least frequently on the

second molar. Bilateral occurrence of the RE ranges from 50 to 67%.[7]

The etiology behind the formation of the RE is still unclear. Indysmorphic, supernumerary roots formation could be related to external factors during odontogenesis, or to penetrance of an atavistic gene or polygenetic system. In eumorphic roots, racial genetic factors influence the more profound expression of a particular gene that results in the more pronounced phenotypic manifestation.[8]

RE can be classified into four different types depending on the location of its cervical part [9]

- Type A: the RE is located lingually to the distal root complex, which has two cone-shaped Macrostructure.
- Type B: the RE is located lingually in the distal root complex, which has one cone-shaped Macrostructure.
- Type C: the RE is located lingually to the mesial root
- Type AC: the RE is located lingually between the mesial and distal root complexes.

De Moor et al. (2004) based on the curvature of the root or root canal Radix entomalaris was classified as:

1. Type 1: A straight root or root canal
2. Type 2: A curved coronal third which becomes straighter in the middle and apical third
3. Type 3: Initial curve in the coronal third with a second buccally oriented curve which begins in the middle or apical third.

Song et al. (2010) further added two more newly defined variants of RE:

1. Small type: Length shorter than half of the length of the distobuccal root
2. Conical type: Smaller than the small type and having no root canal within it.

In about 90% of cases, third root should normally be readily evident in Radiograph .A careful inspection of the radiograph can sometimes reveal the presence of a "hidden" RE as indicated by an unclear view or outline of the distal root contour or the root canal.[10]

According to literature, the majority of radices entomolaris are curved. The additional curve starting from the middle of the root or in the apical third are seen in some cases. There for using precurved files, adequate coronal enlargement avoids hindrances in the coronal segment of the canals and easy passage of the endodontic file to the apical segment. It would also allow root canal irrigants to pass on to the apical segment in larger volumes.[11]

Conclusion

The essential parts of successful management of anatomical variations in endodontic treatment are thorough knowledge and careful examination of the floor of the pulp chamber with conventional radiographs with different angulations to observe the root canal anatomy, in clinical conditions.

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