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Don't miss it radix entomolaris in pediatric patients: An endodontic challenge a report of case series and literature review

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Abstract

A thorough and comprehensive knowledge of internal and external root canal morphology vastly contributes to the success of root canal therapy. Mandibular molars sometimes present with an additional root located distolingually known as radix entomolaris (RE), necessitating a sharp and alert approach from the clinician. Accurate diagnosis and careful application of clinical endodontic skill is important to facilitate the endodontic procedure and to avoid the missed canals in such teeth. This paper describes the diagnosis and endodontic treatment of three cases of mandibular molars with RE, a rare macrostructure.

Keywords: Radix entomolaris, mandibular first permanent molar, distolingual root, three rooted mandibular molar

1. Introduction

The success of Endodontic treatment depends on a thorough chemo mechanical cleaning and shaping of the root canals and achievement of a fluid impervious hermetic seal. Any unidentified root canals cause persistence of pulpal tissue and microorganisms in the root canal system, leading to failure of the root canal treatment^[1]. Thus the awareness and understanding of the root canal anatomy is very essential for the clinician to achieve a successful endodontic outcome.

Most of the permanent mandibular molars are two rooted with three or four canals. Mandibular molars displays considerable anatomic variations and abnormalities regarding the number of roots and canal configuration^[2]. One of the major anatomical variation is the presence of an additional third root also called as radix entomolaris (RE) which is located distolingually and in very rare cases when this additional root is located mesiobuccally, it is called as radix paramolaris (RP)^[3]. RE/RP can be found in first, second and third mandibular molars, occurring least frequently in second molars^[4]. Carabelli was the first person to describe the incidence of extra distolingual root in permanent mandibular molar in 1844, but the term RE was coined by Michaly Lenhossek in 1922^[5]. The formation of RE/RP is generally related to racial, genetic and external factors during odontogenesis^[6]. This additional root is typically smaller than the mesial and distal roots and is usually curved, thus requiring special attention when endodontic intervention is considered^[7]. The purpose of this article is to report diagnosis, clinical approach and endodontic treatment of three cases of RE.

2. Case reports

One male and two female pediatric patients reported to the department of Pedodontics and Preventive Dentistry Government Dental College Srinagar, with symptoms suggestive of pulpal involvement. A detailed case history was elicited following which Clinical and radiographic evaluation revealed that root canal treatment was indicated in all the three cases. RE was identified by assessment of pre-operative radiographs. The criteria used to indicate the presence of RE was clear distinction of an extra root, indicated by the crossing of translucent line defining the pulp space^[8] After explaining the proposed treatment a written consent was taken from all the parents/guardians.

After obtaining adequate anesthesia the teeth were isolated with rubber dam. Conventional root canal treatment was started and trapezoidal access preparation was done with endo access (Eo 123) and Endo z bur (Dentsply Maillefer, Ballaigues Switzerland). The pulp chamber was irrigated with 2.5% sodium hypochlorite and carefully examined with an endodontic probe (DG-16, Dentsply, Gloucester UK). Initial negotiation was done by using precurved K file ISO number 10 (Dentsply Maillefer, Ballaigues Switzerland). Working length was estimated using an apex locator (Root Zx Morita Mfg Corp Kyoto Japan) and confirmed with radiography. The canals were initially instrumented to a size no.15 K file under copious irrigation with 2.5% sodium hypochlorite. Canal preparation was performed using the crown down technique with manual protaper instrument (Dentsply Maillefer, Switzerland) in all the three cases. Following debridement, the canals were irrigated intermittently with 2.5% sodium hypochlorite and saline. Glyde (Dentsply Maillefer, Switzerland) was used as lubricant. At the next appointment, master cone radiographs were obtained and finally obturation was done with AH Plus sealer (De Trey Dentsply, Germany)

& corresponding protaper gutta percha cones. A postoperative radiograph was taken to assess the technical quality of root canal filling and when satisfactory, a permanent filling was placed.

2.1 Case: 1

A 12 year old male patient reported to our department with the chief complaint of pain in the back tooth region of lower right jaw since 10 days. Pain was intermittent in nature, aggravated on taking cold foods and persists even after removal of stimulus. On clinical examination there was a deep carious lesion in relation to tooth number 46. The tooth was tender on percussion. A radiograph was advised that showed a radiolucency involving the pulp in 46. On keen observation, an additional root was noticed which was confirmed by another periapical radiograph taken from a more mesial angulation. Based on history, clinical and radiographic findings a diagnosis of chronic irreversible pulpitis with acute apical periodontitis in 46 was made. Root canal treatment of 46 was planned and performed in the same way as described above (Figure 1 to Figure 5).

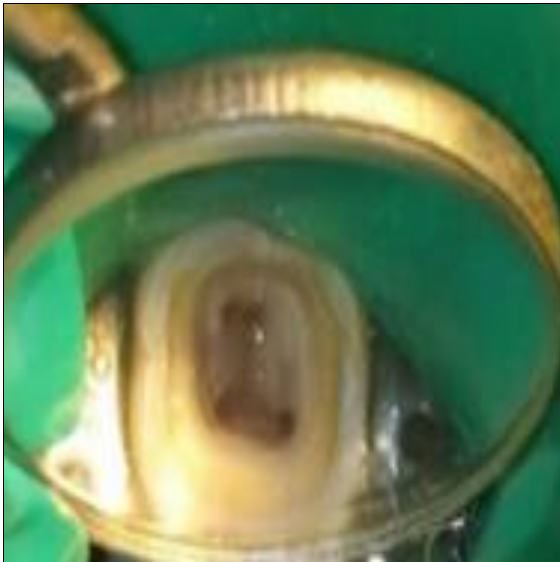


Fig 1: Access cavity preparation



Fig 2: Diagnostic radiograph



Fig 3: Working length determination



Fig 4: Master cone confirmation



Fig 5: Post obturation radiograph

2.2 Case: 2

A 10 year old female patient reported to our department with a chief complaint of pain in her right lower back tooth region since 15 days. On intra oral examination tooth number 46 had a deep carious lesion and was tender on percussion. A diagnostic radiograph was advised and it revealed the widening of periodontal space, loss of lamina dura and diffuse periapical radiolucency in tooth number 46. It also revealed the presence of an additional supernumerary root on distolingual side. To confirm the presence of RE another radiograph with more mesial angulation was taken. Based on clinical and radiographic findings a diagnosis of chronic periapical abscess with 46 was made. It was decided to retain the tooth by doing endodontic therapy. Patient as well as his parent was informed about the treatment and a written consent was taken. The root canal treatment was performed in the same way as described above (Figure 6 to Figure 9).



Fig 6: Diagnostic radiograph

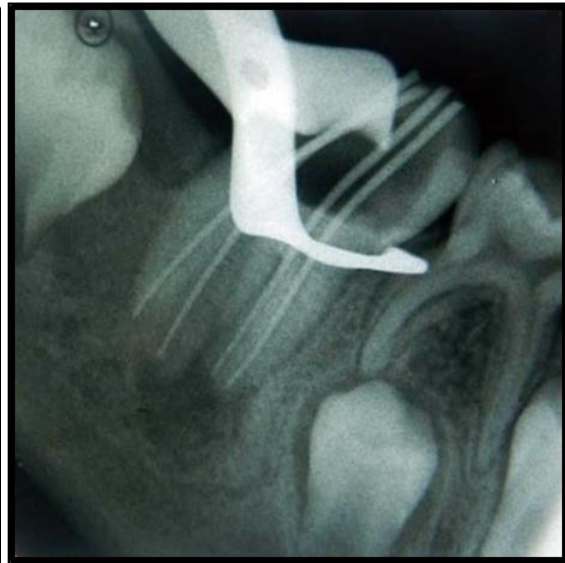


Fig 7: Working length determination



Fig 8: Master cone confirmation

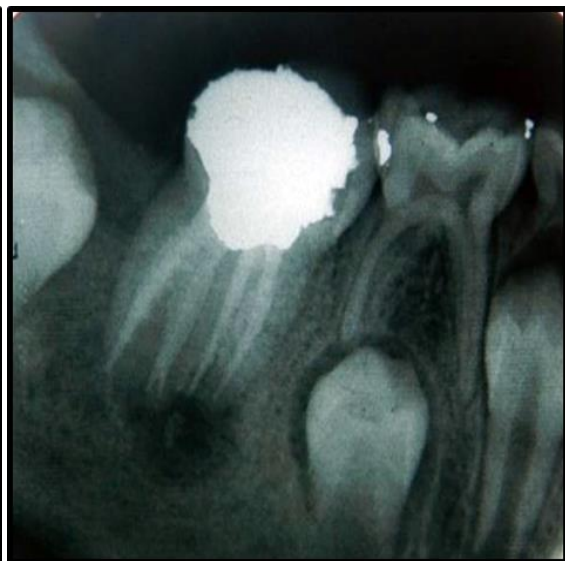


Fig 9: Post obturation radiograph

2.3 Case: 3

A 13 year old female patient came to our department with a chief complaint of pain in her lower back tooth region of left

jaw since 15 days. On clinical examination deep carious lesion was present in permanent left mandibular first molar and the tooth was tender on percussion. The diagnostic

radiograph showed widening of periodontal space. Close inspection of the radiograph also revealed the presence of an additional periodontal space crossing the distal root. To confirm the presence of RE another radiograph with more mesial angulation was taken which revealed that additional

root was present distolingual to the mesial root in 36. Based on the clinical and radiographic findings a diagnosis of chronic apical periodontitis was made and root canal therapy was planned. The root canal treatment was performed in the similar manner as in other cases (Figure 10 to Figure 13).



Fig 10: Diagnostic radiograph

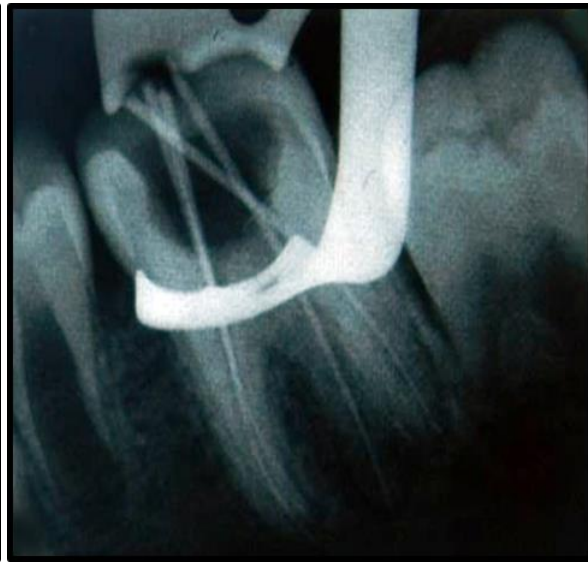


Fig 11: Working length determination



Fig 12: Master cone confirmation



Fig 13: Post obturation radiograph

3. Discussion

The knowledge of existence of RE/RP is essential for the success of endodontic treatment in mandibular molars. Ethnicity has been suggested as a predisposing factor for its presence. The prevalence appears to be 3.4-4.2% in Europeans, 3% in Africans, 1.35% in Germans, less than 5% in Eurasians and Indians, 5-40% in Mongoloid traits such as Chinese, Eskimos and American Indians⁵ and 8.2% in Malaysians⁴. Prevalence of RP is very rare and occurs less frequently than the RE. The prevalence of RP as observed by Visser was 0% for mandibular first molar, 0.5% for second molar and 2% for third molar¹⁹.

Carlson and Alexanderson described four different types of RE on the basis of location of its cervical part and De Moor classified type I to type III for RE based on the curvature of root or root canal¹⁹. RE is mostly located in the same buccolingual plane as the distobuccal root which leads to superimposition of both roots on the preoperative radiograph

resulting in an inaccurate interpretation. This necessitates a second radiograph from a more mesial or distal angulation in order to reveal this supernumerary root. Also, the radiographic features such as double periodontal ligament images or unclear view of distal root or canal should make the clinician to suspect the presence of RE⁸. Cone beam computed tomography (CBCT) has emerged as a useful tool in diagnosing of complex root canal anatomy and can be beneficial in this respect⁷.

Once RE is diagnosed the access cavity preparation should be modified from a triangular to a trapezoidal shape¹⁰. Advanced diagnostic aids such as magnifying loupes or surgical microscopes can help in better visualisation of all the canals. Traditional methods like bubble effect/champagne effect, transillumination, white line test or red line test can also be used to detect the additional canals. However it may still be missed due to its slender dimension occasionally¹¹

4. Conclusion

The initial diagnosis of RE before starting the root canal therapy is important to facilitate the endodontic procedure and avoid the mislocation of any canal. The knowledge of such morphological variations and adapted clinical approach becomes mandatory for long term success in such cases.

5. References

1. Kamath U, Sheth H, Mohan N, Reddy D. Endodontic management of radix entomolaris: Case Reports. International Journal of Applied Dental Sciences 2015; 2(1):15-9.
2. Kiran K, Prashant B, Rohit P, Swati S, Suresh K. Endodontic management of Radix Entomolaris- A case report. J Pharm Biomed Sci 2013; 31(31):1247-9.
3. Nagaveni NB, Umashankar KV, Radhika NB, Satisha TS. Third Root (Radix Entomolaris) In Permanent Mandibular First Molars in Pediatric Patients – An Endodontic Challenge. J Oral Health Comm Dent 2011; 5(1):49-51.
4. Bhatia S, Kohli S, Parolia A, Lim NY, Tung LC, Hean TE. Prevalence of Radix Molar in Mandibular Permanent Molars: An Observational Study in Malaysian Population. J.oral Health and Dent. Mng. 2015 feb; 14(1):32-36.
5. Calberson FL, De Moor RJ, Deroose CA. The radix entomolaris and paramolaris: clinical approach in endodontics. Journal of endodontics. 2007; 33(1):58-63.
6. Ballullaya SV, Vemuri S, Kumar PR. Variable permanent mandibular first molar: Review of literature. Journal of conservative dentistry: JCD. 2013; 16(2):99.
7. Tu MG, Huang HL, Hsue SS, Hsu JT, Chen SY, Jou MJ *et al.* Detection of permanent three-rooted mandibular first molars by cone-beam computed tomography imaging in Taiwanese individuals. Journal of Endodontics. 2009; 35(4):503-7.
8. Tu MG, Tsai CC, Jou MJ, Chen WL, Chang YF, Chen SY *et al.* Prevalence of three-rooted mandibular first molars among Taiwanese individuals. Journal of Endodontics. 2007; 33(10):1163-67.
9. Chole D, Maske K, Kundoor S, Bakle S, Gandhi N, Deshpande R. Endodontic Management of Radix Entomolaris: Case Report. IOSR-JDMS. 2017; 16(4):75-78.
10. Hegde V, Kashid V. Radix Entomolaris-Series of Case Reports. International Journal of Advances in Case Reports. 2015; 2(4):216-220.