

Endodontic Management of Radix Entomolaris: A Case Report

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I. INTRODUCTION

The third root in addition to the two roots of mandibular first molar was reported by Carabelli as Radix Entomolaris (RE). Three rooted mandibular first molars deserve special attention as they are structurally different from that of the other two roots in either size or shape and even sometimes may vary in both. The occurrence of third root varies in different ethnic groups, with the incidence of less than 5 % in Indian population.

The preliminary diagnosis of these variations is done routinely with radiographic techniques. Radiographic diagnosis plays a pivotal role in successful endodontic treatment, and when taken at different angulations gives information about extra canals or roots and aids in the better understanding of the anatomy of the root canal system and the treatment approach with sufficient knowledge and absolute clinical thoroughness for successful root canal treatment.

Successful outcome of root canal treatment is determined by the awareness, knowledge, and thorough cleaning and shaping of all the root canals before the root canal filling. Like the number of root canals, the number of roots may also vary.

This case report discusses the diagnosis and successful endodontic management of two cases showing unusual root canal configuration in a mandibular first molar (46) showing three roots and four canals.

II. CASE REPORT

A 35 year-old male patient reported to the Department of Conservative Dentistry and Endodontics with a chief complaint of pain in lower-right back tooth region for 2 months. The patient revealed a history of mild intermittent pain for the past 2 months, which had increased in intensity during the past 2 weeks. The patient reported prolonged sensitivity to hot and cold substances. The pain was spontaneous and aggravated particularly at night. Clinical examination revealed deep occlusal carious lesions on mandibular first molar. The tooth 46 was tender to vertical percussion. The preoperative radiograph revealed radiolucency of carious lesion involving the pulp with respect to 46 with periapical radioopacity. (Figure 1)



Figure 1

Based on the clinical and radiographic findings, a diagnosis of symptomatic irreversible pulpitis with symptomatic apical periodontitis with respect to 46 was made, informed consent was obtained, and endodontic treatment was initiated.

Clinical management

Radiographic evaluation of the involved tooth revealed two completely formed roots with no indication of any variation in the root canal anatomy in 46. The tooth was anesthetized using lignocaine. After caries excavation, rubber dam isolation was done and access cavity was prepared on tooth 46. (Figure 2)



Figure 2

On inspection with a DG-16 endodontic explorer initially, the pulp chamber floor revealed three canals – mesiobuccal, mesiolingual, and the distal. A search for the second distal canal was made by further exploration of the pulpal floor with a DG-16 endodontic explorer. A catch disto lingually unveiled the second distal orifice, and the access cavity was modified from a triangular form to a trapezoidal shape to include the distolingual canal. Negotiation of the canals was carried out with ISO size 6, 8, and 10 K files. Working length was determined using the J. Morita (Mfg Corp, Japan) apex locator with 15 No. K file and was verified using periapical radiograph. The working length radiograph taken with different horizontal angulations revealed the presence of a third root located distolingually. (Figure 3)



Figure 3

Cleaning and shaping was done using Protaper (Dentsple Maillifer) rotary files with respect to 46. All the canals were irrigated with ultrasonic (Ultra- X, ORIKAM) using 3% sodium hypochlorite solution and 17% Ethylene Diamine Tetra Acetate solution. (Figure 4)



Figure 4

The canals were finally flushed with sterile saline. Master cones were inserted to the working length and were confirmed radiographically. (Figure 5)

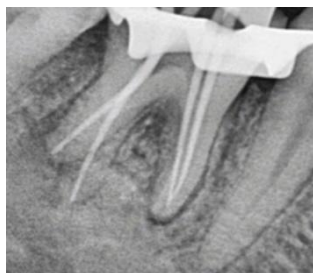


Figure 5

The canals were dried with paper points and obturation was performed followed by postobturation restoration. Final radiographs were taken to establish the quality of the obturation. (Figure 6)

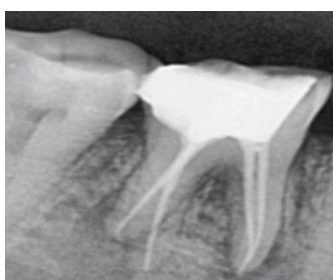


Figure 6

III. DISCUSSION

A thorough knowledge of internal and external anatomy coupled with a correct diagnosis, adequate cleaning, and shaping of the root canal system will normally lead to a successful outcome. The presence of RE or a radix paramolaris has clinical implications in endodontics, and an accurate diagnosis of these supernumerary roots can avoid complications or a “missed canal” during root canal treatment. Because RE is mostly situated in the same buccolingual plane as the distobuccal root, a superimposition of both roots can appear on the preoperative radiograph, resulting in an inaccurate diagnosis. A thorough inspection of the preoperative radiograph and interpretation of particular marks or characteristics, such as an unclear view or outline of the distal root contour or the root canal, can indicate the presence of a “hidden” RE. To reveal the RE, a second radiograph should be taken from a more mesial or distal angle (30°). The location of the orifice of the root canal of an RE also has implications for the opening cavity. The orifice of the RE is located distolingually to mesiolingually from the main canal or canals in the distal root. An extension of the triangular opening cavity to the distolingual results in a more rectangular or trapezoidal outline form. This way an accurate diagnosis can be made in the majority of cases.

Classification

Carlsen and Alexandersen (1990) classified RE into four different types based on the location of its cervical part:

1. Type A: The RE is located lingually to the distal root complex which has two cone-shaped macrostructures
2. Type B: The RE is located lingually to the distal root complex which has one cone-shaped macrostructure
3. Type C: The RE is located lingually to the mesial root complex
4. Type AC: The RE is located lingually between the mesial and distal root complexes.

De Moor et al. (2004) classified RE based on the curvature of the root or root canal:

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: An initial curve in the coronal third with a second buccally oriented curve which begins in the middle or apical third.

In the present case report, the location and identification of the canal orifices were done by conventional methods using the DG-16 endodontic explorer, knowledge of the roots, and root canal anatomy along with that of the conventional periapical radiographs to determine the canal configuration. The RE in the case was found to be with straight root and root canal classified to be De Moors Classification Type I which was managed successfully.

IV. CONCLUSION

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

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Conflicts of interest There are no conflicts of interest.

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