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Occurrence of Radix Entomolaris in mandibular first molar

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Abstract

Background: The present study aimed to report occurrence of radix entomolaris in mandibular first molar.

Materials and methods: The present study was conducted on 428 mandibular first molar in 280 patients. The incidence of RE and comparison of the occurrence between males and females and between the right and left sides of the mandible were recorded.

Results: Out of 210 molars in males, 10 (4.76%) had and out of 218 molars in females, 8 (3.66%) had Radix Entomolaris. The difference was significant ($P < 0.05$). 12 Radix Entomolaris were seen in 238 left molars and 6 were seen in 190 right molars. The difference was significant ($P < 0.05$).

Conclusion: Authors found that Radix Entomolaris was commonly seen in males. Left side exhibited more Radix Entomolaris as compared to right side.

Keywords: Mandibular first molar, Radix Entomolaris, right side

Introduction

Successful outcomes of endodontic treatment depend on the identification of all roots and root canals which in turn guarantees complete extirpation of pulp tissue, proper chemomechanical cleaning and shaping and three-dimensional obturation of the root canal system with an inert filling material^[1]. Failure of at least one of these stages entails high risk of unsuccessful root canal treatment of the tooth with a subsequent development or persistence of a periapical lesion^[2].

It is known that the mandibular first molar can display several anatomical variations. The majority of Caucasian first molars are two-rooted with two mesial and one distal canal. In most cases the mesial root has two root canals, ending in two distinct apical foramina. Or, sometimes, these merge together at the root tip to end in one foramen. The distal root typically has one kidney-shaped root canal, although if the orifice is particularly narrow and round, a second distal canal may be present^[3].

One of the major anatomical variations is the presence of an additional third root, also called the radix entomolaris (RE) which is located distolingually in mandibular molars^[4]. In very rare cases, when this additional root is located mesiobuccally, it is called radix paramolaris. Knowledge of occurrence, location, and incidence of any tooth anatomical variation is important as it has a significant role in clinical dentistry. Many epidemiological studies have highlighted the importance of watching RE while performing root canal treatment on mandibular first molars^[5]. The present study reported that occurrence of radix entomolaris in mandibular first molar.

Materials and Methods

The present study was conducted in the department of Endodontics. It comprised of 428 mandibular first molar in 280 patients. All the patients were informed and their consent was obtained. Ethical approval for the study was also obtained.

Two preoperative radiographs were taken for each tooth undergoing root canal treatment at different angulation. Conventional access cavity preparation was completed in all teeth. The pulp chamber was irrigated with 3% sodium hypochlorite and carefully examined with an

endodontic probe. All canals were scouted using K-file number 10. Working length was estimated using an apex locator and confirmed with a working length radiograph with K-files introduced into the canals. After complete cleaning and shaping, all canals were obturated using lateral condensation technique. AH plus was used as a sealer. A postoperative radiograph was taken to assess the technical

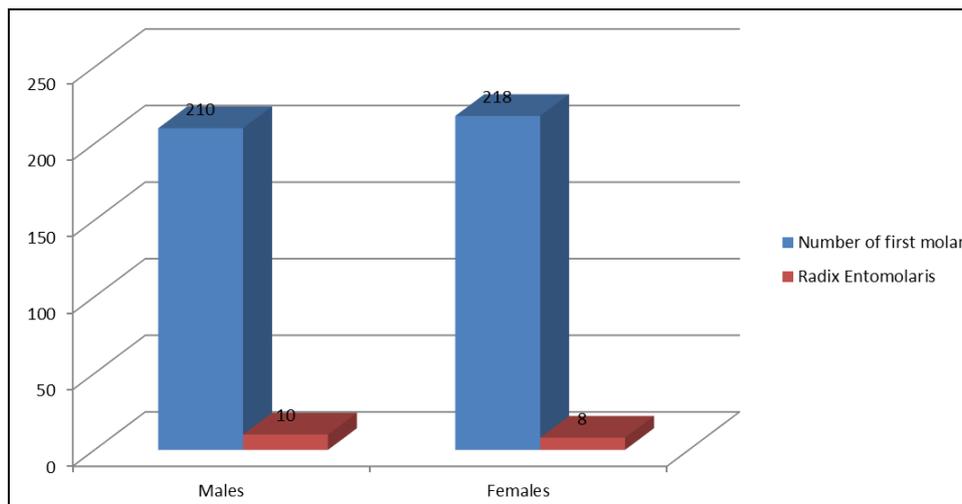
quality of root canal filling. The incidence of RE and comparison of the occurrence between males and females and between the right and left sides of the mandible were recorded. Results were statistically analyzed with p value < 0.05 was considered significant.

Results

Table 1: Occurrence of Radix Entomolaris

Gender	Number of first molar	Radix Entomolaris	Percentage	P value
Males	210	10	4.76	0.05
Females	218	8	3.66	

Table 1, graph 1 shows that out of 210 molars in males, 10 (4.76%) had and out of 218 molars in females, 8 (3.66%) had Radix Entomolaris. The difference was significant ($P < 0.05$).

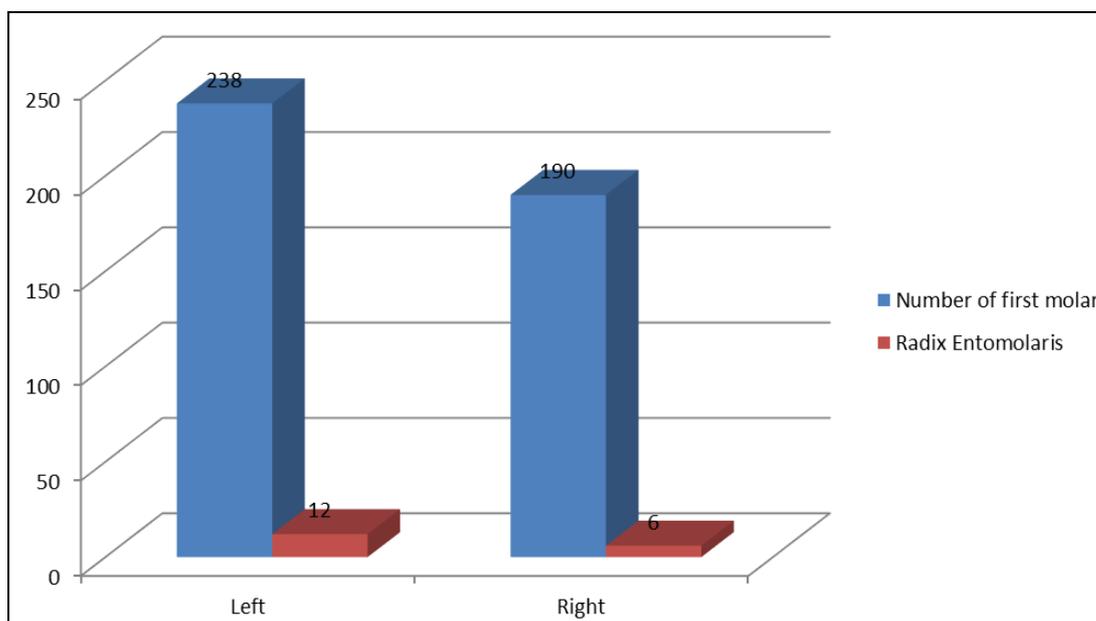


Graph 1: Occurrence of Radix Entomolaris

Table 2: Occurrence of Radix Entomolaris in both sides

Gender	Number of first molar	Radix Entomolaris	Percentage	P value
Left	238	12	5.08	0.01
Right	190	6	3.15	

Table 2, graph 2 shows that 12 Radix Entomolaris were seen in 238 left molars and 6 were seen in 190 right molars. The difference was significant ($P < 0.05$).



Graph 2: Occurrence of Radix Entomolaris in both sides

Discussion

For successful endodontic treatment of all canals of the tooth careful radiographic diagnosis plays a pivotal role. Several authors have reported about the morphology of the mandibular first molars [6]. These articles have shown that mandibular first molars usually have three or four canals. Along with the number of root canals, the number of roots may also vary. The majority of first and second mandibular molars are two rooted with two mesial and one distal canals. Radiographs taken at different angulations reveal the basic information regarding the anatomy of a tooth and can thus help to detect any aberrant anatomy such as extra canals/roots [7]. However, a significant constraint in conventional radiography is that it produces a two dimensional image of a three-dimensional object, resulting in the superimposition of the overlying structure. To achieve a more detailed understanding of the morphological structure of root canals and their interrelations, more advanced diagnostic tools are required [8]. The present study reported that occurrence of radix entomolaris in study group.

In this study we found that out of 210 molars in males, 10 (4.76%) had and out of 218 molars in females, 8 (3.66%) had Radix Entomolaris. Mukhaimer *et al.* [9] evaluated clinically the percentage of permanent mandibular first molar teeth with three roots. Three hundred twenty-two mandibular first molars from 185 females and 137 males scheduled for root canal treatment were examined over a 2-year period. The incidence of a third root revealed by periapical radiographs and the comparison of the occurrence between males and females and between the right and left sides of the mandible were recorded. Of the 322 treated mandibular first molars, twelve teeth were found to have a third root with an overall incidence being 3.73%. More teeth with a third root were treated on the right side of the mandible compared to the left side.

We found that 12 Radix Entomolaris were seen in 238 left molars and 6 were seen in 190 right molars. The difference was significant ($P < 0.05$). De Moor *et al.* [10] discussed endodontic treatment of three mandibular molars with a radix entomolaris or paramolaris. The etiology behind the formation of the RE is still unclear. In dysmorphic, supernumerary roots, its formation could be related to external factors during odontogenesis, or to penetrance of an atavistic gene or polygenetic system (atavism is the reappearance of a trait after several generations of absence). In eumorphic roots, racial genetic factors influence the more profound expression of a particular gene that results in the more pronounced phenotypic manifestation. Curzon [11] suggested that the 'three-rooted molar' trait has a high degree of genetic penetrance as its dominance was reflected in the fact that the prevalence of the trait was similar in both pure Eskimo and Eskimo/ Caucasian mixes.

When the occurrence of RE is confirmed or suspected on the radiograph, the access cavity preparation should be modified from the classic triangular access to a more rectangular or trapezoidal outline. The orifice of RE is mainly located disto-mesiolingually from the main distal canal. If the entrance of RE canal is not clearly visible after removal of the pulp chamber roof, a more thorough inspection of the pulp chamber floor and wall, especially in the distolingual region, is necessary. A sharp endodontic explorer (DG-16) can be useful in this respect [12].

Conclusion

Authors found that Radix Entomolaris was commonly seen in

males. Left side exhibited more Radix Entomolaris as compared to right side.

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