

Endodontic Management of Radix Entomolaris

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Abstract: The treatment of mandibular molars has been challenging to the endodontist due to its several anatomical variations. The majority of mandibular first molars are two rooted with one mesial root and one distal root. It can have an additional root located lingually (radix entomolaris) or buccally (radix paramolaris). Success of endodontic treatment depends on thorough mechanical and chemical cleaning of the root canal system and obturation with an inert filling material. Lack of a working knowledge of pulp anatomy ranks second to inaccurate diagnosis and treatment planning as a cause of endodontic treatment failure. Hence accurate diagnosis and careful application of clinical endodontic skill is essential for the good prognosis of mandibular with this root morphology.

Keywords: Anatomical variation, Endodontic treatment, Mandibular molar, Radix entomolaris.

I. Introduction:

The main objective of root canal treatment is thorough debridement of root canals and their disinfection before obturation and sealing. It is known that the permanent mandibular first molar can display several anatomical variations and, like the number of root canals, the number of root may also vary.^[1, 2] A major anatomical variant of the two-rooted mandibular first molar is the third root known as radix entomolaris [RE], first mentioned in the literature by Carrabelli.^[3] The incidence of occurrence of radix entomolaris is 3.4-4.5% in Europeans, 3% in Africans, <5% in mongoloid traits.^[4] Some studies report a bilateral occurrence of the RE from 50-67%.^[5] Classification of Radix entomolaris – as proposed by Ribeiro and Consolaro 1997 based on the curve of the root or root canal.^[6]

Type 1- Refers to a straight root/root canal.

Type 2- Refers to an initially curved entrance and continuation as a straight root/root canal.

Type 3- Refers to an initially curve in the coronal 3rd of root canal and a 2nd buccally oriented curve starting from the middle to the apical 3rd.

II. Case Report

A 20 years old male patient reported to the department of dentistry with the chief complaint of pain in lower right back teeth region since one week. Pain was of intermittent type, aggravated on intake of cold beverages and persisted even after the removal of stimulus. On intraoral examination a deep carious lesion in 46 noted. Diagnostic radiograph was taken which revealed deep carious lesion involving the pulp with periapical changes, along with the presence of extra root distally noted [Figure 1]. Endodontic treatment was planned, access opening done, the fourth canal was in the distolingual aspect, which gave a trapezoidal form of access preparation. Root canals were located with DG 16 endodontic explorer. Patency of the canal was made with K-file no.15. Working length determined [Figure 2]. Chemo mechanical preparation of the root canal done with rotary protaper instruments in crown down technique, irrigated with sodium hypo chloride and smear clear solution. Master cone selection done [Figure 3], obturation done using 6% gutta-percha, access cavity restored with composite restorative materials and post obturation radiograph was taken [Figure 4].

III. Discussion:

Ingle^[7] stated that the most frequent cause of endodontic failure is a canal that is left untreated because a clinician fails to recognize it. An accurate diagnosis of the supernumerary roots can avoid complications or a missed canal during root canal treatment. Apart from complicating the root canal procedures, RE has been found to be a contributing factor to localized periodontal destruction.^[2] During extraction procedure, if rotational movements are used, there are chances of RE root fracture due to its divergent morphology.^[2, 3] RE can be found on the 1st, 2nd and 3rd mandibular molar, occurring least frequently on 2nd molar.^[8] The reason for formation of supernumerary root in mandibular molar is unclear. In dysmorphic root it can be related to external factors during osteogenesis, or to penetrance of an atavistic gene/polygenetic system. In eumorphic roots, racial genetic factors influence the more profound expression of a particular gene that result in more pronounced phenotypic manifestation.^[9] The proper application of Clarks rule or the buccal object rule facilitates locating additional canal and distinguishing between objects that have been super imposed. Hence, to reveal RE an

additional radiograph should be taken from a more mesial or distal angle. With distolingually located orifice of RE a modification of classical triangular access to a cavity to trapezoidal form, so as to better locate and access the root canal is essential. The use of flexible nickel-titanium rotary files allows a more centered preparation shape with restricted enlargement of the coronal canal third and orifice relocation. Therefore, after relocation and enlargement of orifice of RE initial root canal exploration with small files together with radiographical and electronic root canal length determination and the creation of a glide path before preparation, are actions that should be taken to avoid procedural errors.^[10]

IV. Figures:



Figure 1: Pre-operative radiograph showing extra root distally

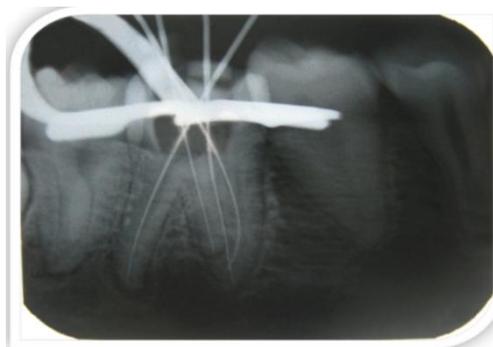


Figure 2: working length radiograph



Figure 3: radiograph showing master cone selection.



Figure 4: Post obturation radiograph.

V. Conclusion:

RE is quite uncommon in Indian population. The accurate diagnosis of RE and its thorough cleaning, shaping and obturation is very essential. Failure to detect and treat an RE significantly affects the outcome of an endodontic treatment. Hence clinician should have awareness regarding the occurrence of RE as an anatomical variant.

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