Journal Homepage: - www.journalijar.com
INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)
Article DOI:10.21474/IJAR01/2602
DOI URL: http://dx.doi.org/10.21474/IJAR01/2602
ISSN NO. 2320-5407

RESEARCH ARTICLE

SUPERNUMERARY ROOT IN MANDIBULAR FIRST MOLAR: RADIX ENTOMOLARIS- A CASE REPORT.

Dr. Krishna PrasadaLashkari and Dr. AlkaShukla.

Manuscript Info

Manuscript History

Received: 28 October 2016
Final Accepted: 27 November 2016
Published: December 2016

Key words:-
Permanent mandibular first molar; Radix entomolaris; Additional third root; Supernumerary root

Abstract

A successful endodontic therapy demands not only good skills and instruments but also a thorough knowledge of internal and external root canal anatomy. Usually mandibular molars have two roots with three canals (mesiobucccal, mesiolingual & distal) but sometimes, the number of roots and canals may vary. Mandibular molars may have an additional root located either buccally (radix paramolaris)or lingually (radix entomolaris). This case report presents endodontic managementof a mandibular first molar with radix entomolaris.

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Introduction:-

Endodontic therapy aims at to prevent or cure pulpal and periapical pathologies caused by infection of root canal systems of the affected teeth.[1,2,3] Success of endodontic therapy is attributed to complete elimination of microbial infection, meticulous chemomechanical cleaning and shaping, followed by three-dimensional obturation of the root canal space.[1,4] In order to perform thorough cleaning and shaping, it is mandatory for an endodontist to know the possible variations in anatomy of tooth of interest.

One of the anatomical variations of tooth is presence of extra root. Carabelli was the first person to describe incidenceof extra distolingual root in permanent mandibular molar. If the supernumerary root is present distolingually itis called as radix entomolaris (RE), on the other hand if it is located mesiobuccally, it is called as radix paramolaris.[5]

Carlsen&Alexandersen (1990) classified radix entomolaris (RE) into four different types based on the location of its cervical part.[6]

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 macrostructures.
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 radix entomolaris based on the curvature of the root or root canal.[7]

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.

Corresponding Author:- Dr. Alka Shukla

Song JS et al. (2010) further added two more newly defined variants of RE.[8]
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.

A Case report on morphology, clinical approach to diagnosis and management of radix entomolaris has been presented here.

Case Report:-

A 19 year old, female patient without any relevant contributing medical history reported to department of Conservative Dentistry and Endodontics with severe pain in the mandibular left jaw region for the past ten days.

Extraoral and intraoral examination: No noticeable change related to the chief complaint was seen.Tooth number 36 had a deep class II carious lesion. The tooth was tender on percussion. The colour and surface texture of the oral soft tissue was normal.

Preoperative radiographic evaluation:It revealed the widening of periodontal space and loss of lamina dura in tooth 36. 36 also revealed the presence of extra root located along with distal root though it was not clearly visible[Figure 1].

Diagnosis and treatment planning:Chronic irreversible pulpitis with acute apical periodontitis was established as a diagnosis based on the patient history and clinical examination.It was decided to retain the tooth by doing endodontic therapy.Patient was informed about the treatment and consent was obtained.

Endodontic procedure: Local anesthesia was administered and rubber dam was applied. Caries was excavated and access cavity was prepared with round bur and safe end Endo-Z bur. After entirely removing the roof of the pulp chamber, two mesial canal orifices and one distal orifice were located. The dentinal map seemed to be slightly extending in distolingual direction, therefore access preparation was modified. The fourth canal orifice was explored with DG 16 explorer. Canals were negotiated using #10 size K-file. Working lengths were determined electronically by using apex locator and later verified radiographically [Figure 2]. Canals were instrumented using rotary Ni-Ti files [ProTaper,Dentsply-Maillefer, Ballaigues, Switzerland]. During cleaning and shaping, the root canals were irrigated with copious amounts of 3% sodium hypochlorite solution and lubrication with RC-Prep. The canals were then rinsed with saline. Mesiobuccal, mesiolingual and distal canals were enlarged up to F2 ProTaper files. As the radix root was curved and narrow, it was enlarged only up to F1 ProTaper file corresponding to a tip size of ISO 20.Canals were dried with paper point and obturation was carried out with gutta-percha and zinc oxide eugenol sealer.The access cavity was sealed and the root canal filling was evaluated radiographically [Figure 3 and 4].

Fig 1:- Preoperative radiographic

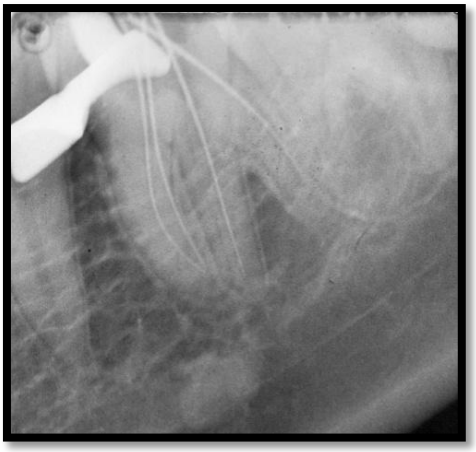

Fig 2:- Working length determination

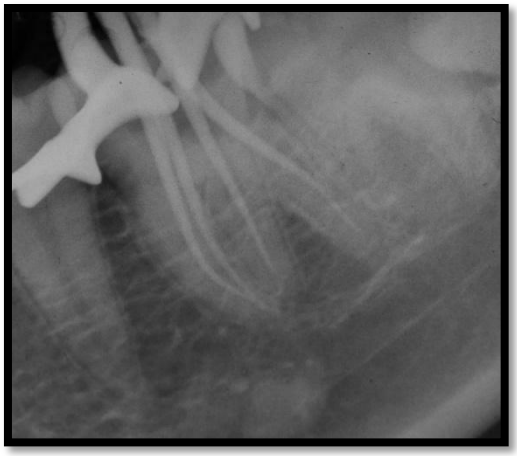

Fig 3:- Master cone

Fig 4:- Obturation

Discussion:-

It is common to find mandibular first molars with two roots; one being mesial and another being distal. Sometimes, an extra supernumerary root may be encountered.[9,10]Incidence varies from 3 to 30% and with least in African population and highest being in populations with Mongoloid traits such as the Chinese, Eskimo and American Indians.[1,9,11,12]The etiology of radix entomolaris is still hazy. Its formation is often attributed to influence of external factors during odontogenesis and genetic make-up of which varies among different races.[1,10]

To render a better treatment, it is necessary to identify the extra root which is present and perform endodontic therapy. A correct diagnosis needs minimum of two diagnostic radiographs taken at different angulations using buccal object or SLOB rule(same side lingual opposite side buccal).[13,14]An angled radiograph (25-30°) can also be useful in this regard and it is seen that a mesial angled radiograph is better than a distal angled radiograph for RE detection.Radiographically, double periodontal ligament images or an unclear view or outline of the distal root contour or the root canal can also suggestthe presence of an RE.[15,16,17]Even the presence of an extra cusp may sometimes indicate the presence of RE.[10]

Conventional radiographic method has a limitation of superimposition of the distal roots, which may sometimes mask the extra root. Therefore the more promising imaging method which is cone beam computed tomography(CBCT),is the ideal technique to confirm the presence of supernumerary roots.

Other difficulty which is often encountered by clinician dealing with RE is locating the orifice of RE. The overhanging dentin usually makes it difficult for clinician to locate the RE orifice. Therefore modification of classical triangular access cavity to a trapezoidal form can be done to facilitate the accessibility to RE. Then dentinal maps should be traced properly to get the location of RE orifice.[18]After modifying access cavity and complete removal of pulpal roof, if still clinician faces difficulty in locating RE orifice, application of magnifying instruments like dental loupes, dental operating microscopes is recommended. Ultimately all the root components including RE should be located and treated to get good results of endodontic therapy.

Conclusions:-

To deliver a good quality endodontic treatment, endodontists should be aware of all possible anatomical variations of teeth. Along with knowledge, clinician should also be equipped with adequate diagnostic aids to establish correct diagnosis before starting the treatment. RE which was initially considered to be a big challenge can easily be dealt with, if clinician is aware of all the modalities needed to tame it.

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