

Case Study

Diagnosis of Bilateral Type-A Radix Paramolaris on mandibular first molars.

Abstract

Successful endodontic treatment of a molar tooth having an additional root whether it is radix para/ento molaris; begins with proper diagnosis. Hence careful examination and assessment of intra oral peri-apical radiographs should be done prior to attempting access opening. These IOPA's provides sufficient details regarding presence of additional roots. Mesial or distal cone shift technique could be used to assess according to operator's choice to confirm presence of additional roots. Access opening design will require modification in order to accommodate a straight line entry to the additional root (RP or RE). Cleaning and shaping can follow with standard procedures unless there is presence of additional canals in the same root such as mid mesial canal. In such cases, it may be wise not to enlarge the canal with a 6% taper; as it will compromise lot of intra canal dentin and weaken the root. However, once the tooth is successfully treated endodontically; one can proceed to do crown prosthesis of clinician's choice depending on various factors.

Keywords: *[Radix Paramolaris; Cone beamed CT; Congenitally missing second premolars, Endodontics]*

Case Report

The images presented here is of a patient who is 40 years old. Upon check-up and routine documentation, he was diagnosed with irreversible pulpitis in left mandibular first molar. On radiographic (Intraoral Peri-apical; [IOPA]) examination (figure-1) the presence of an additional root was confirmed to be radix paramolaris.

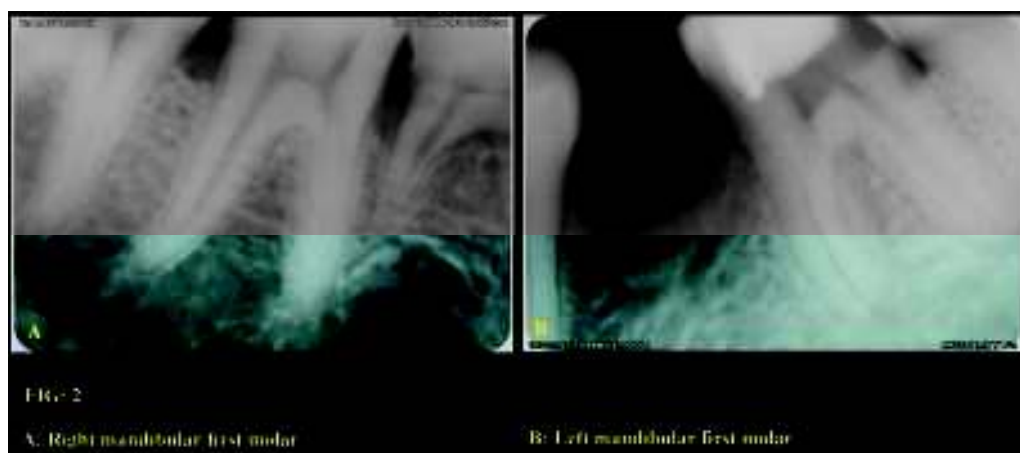


Figure 1: Intraoral Peri-apical radiographs

He also presented with an over retained right mandibular deciduous second molar. Upon radiographic examination the premolar was found congenitally missing and the right mandibular first molar was having an additional root, confirmed to be radix paramolaris. He also had a history of recent extraction of a decayed tooth on the left side which he described as a very small dark posterior tooth with multiple roots. It was suggestive of a left deciduous molar. This confirmed bilateral congenital absence of mandibular second premolars. An orthopantomograph was advised to confirm clinical findings and to rule out other issues like unusual impactions of the missing teeth (figure-2). The left mandibular first molar was carious and was indicated for an endodontic therapy.

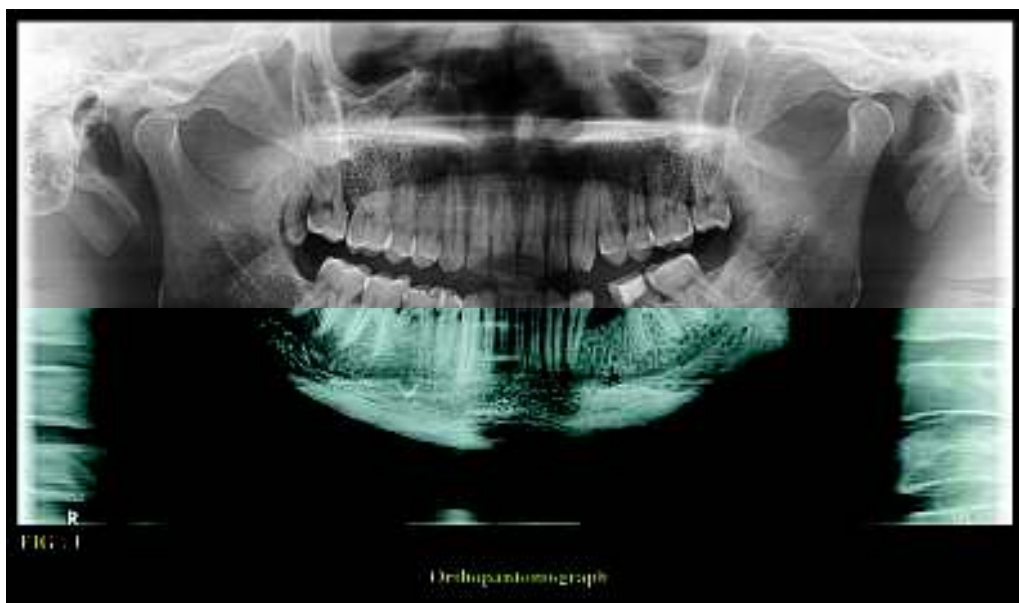


Figure 2: Orthopantomograph

Discussion

Bilateral radix paramolaris is a very rare occurrence as per reports published so far. It is considered to be 0 – 5 % in different populations as per research articles published in unilateral cases.[1] Studies contradict each other on more percentage of its occurrence on right and left sides of the mandibular arch.[2,3] However, bilateral occurrence of radix paramolaris on mandibular has not been reported.

NB Nagaveni and KV Umashankara suggested that a thorough examination of the preoperative radiograph and interpretation of particular marks or characteristics, such as an unclear view or outline of the distal/mesial root contour or the root canal, can suggest the presence of a "hidden" RE/RP (Radix Entomolaris/Radix Paramolais). In their study they found only two unilateral cases of radix paramolaris type –A mesiobuccal root.[4] Carlsen O and Alexandersen V classified the radix paramolaris as Type – A and Type – B. Type-A is an additional mesio-buccal root whose coronal part is attached to the mesial root complex and Type- B is an additional root which is seen in the central point of mesial and distal roots buccally.[5] In their study, they

49 found five cases of type A and none of type B in the total 203 permanent molars
50 examined.

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52 However, recent advances in the field of dental radiography like micro-computed
53 tomography (micro CT) and cone-beam computed tomography (CBCT) helps by a
54 great deal in diagnosing such exceptional occurrences thereby helping in quality
55 treatment for the patients.[6,7] Ingle et al. recommended a thorough radiographic
56 study of the involved tooth, using exposure from the standard buccal-to-lingual
57 projection, one taken 20° from the mesial, and the third taken 20° from the distal to
58 obtain basic information regarding the anatomy of the tooth. Loh has claimed that the
59 RE/RP does not normally appear in peri-apical radiographs that are taken in the
60 traditional manner. Adjusting the exposure time and dose of the x-ray and angulating
61 the main beam (to avoid superimposing the larger disto-buccal/mesial root) can to
62 help make RE/RP more evident although accurate interpretation of radiographs
63 depends on the trained eye.[7] A 1985 study by Walker and Quackenbush claimed
64 that panoramic radiographs resulted in an accuracy rate of approximately 90%.
65 Bilateral occurrence of radix paramolaris is very rare. Thorough examination of the
66 preoperative radiograph and interpretation of particular marks or characteristics, such
67 as an unclear view or outline of the distal/mesial root contour or the root canal, can
68 suggest the presence of a "hidden" RE/RP.[8]

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70 **Endodontic management**

71 Successful endodontic treatment of a molar tooth having an additional root whether
72 it is radix para/ento molaris; begins with proper diagnosis. Hence careful
73 examination and assessment of intra oral peri-apical radiographs should be done
74 prior to attempting access opening. These IOPA's provides sufficient details
75 regarding presence of additional roots. Mesial or distal cone shift technique could be
76 used to assess according to operator's choice to confirm presence of additional roots.
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standard procedures unless there is presence of additional canals in the same root such as mid mesial canal. In such cases, it may be wise not to enlarge the canal with a 6% taper; as it will compromise lot of intra canal dentin and weaken the root. However, once the tooth is successfully treated endodontically; one can proceed to do crown prosthesis of clinician's choice depending on various factors.

However; the case presented here is a left mandibular first molar diagnosed with irreversible pulpitis. It was indicated for an endodontic treatment followed by crown prosthesis. The area was anesthetized with an inferior alveolar nerve block prior to rubber dam application. An access preparation was made to obtain straight line access to all the canals including the radix para molaris; with an extension into the mesio buccal aspect of the tooth. Upon completion of access preparation, pulpal remnants were extirpated and the orifices of all the 5 canals were located. The 5 canals were the mesio-buccal canal, mesio-lingual canal, disto-buccal canal, disto-lingual canal and the type-A radix paramolaris. Cleaning and shaping of these canals were done with hand Protaper instruments upto F2 with 6% taper after confirming the working length of all the canals (figure-3). The tooth was obturated with a cold lateral condensation technique in the following visit.

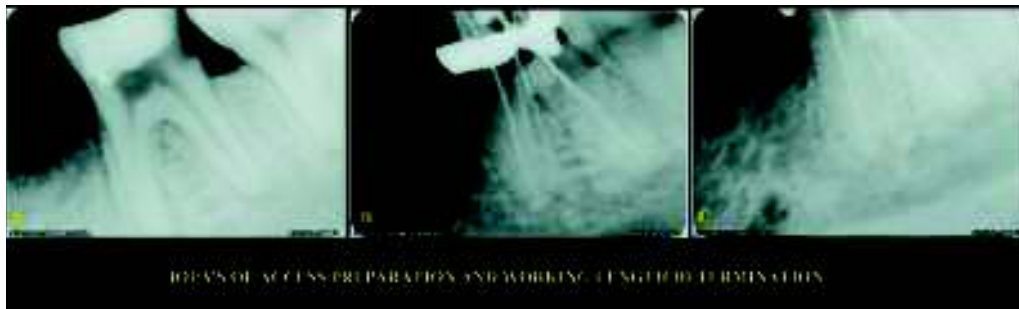


Figure 3: Iopa's of Endodontic management

A Cone beamed CT was advised to re-confirm the earlier findings with the IOPA's. It confirmed the bilateral congenital absence of mandibular second premolars and a bilateral radix paramolaris with the mandibular first molars (figure-4).



The arial view with dissections at coronal, mid and apical aspects clearly suggests the presence of a Type-A radix paramolaris (figure-5).

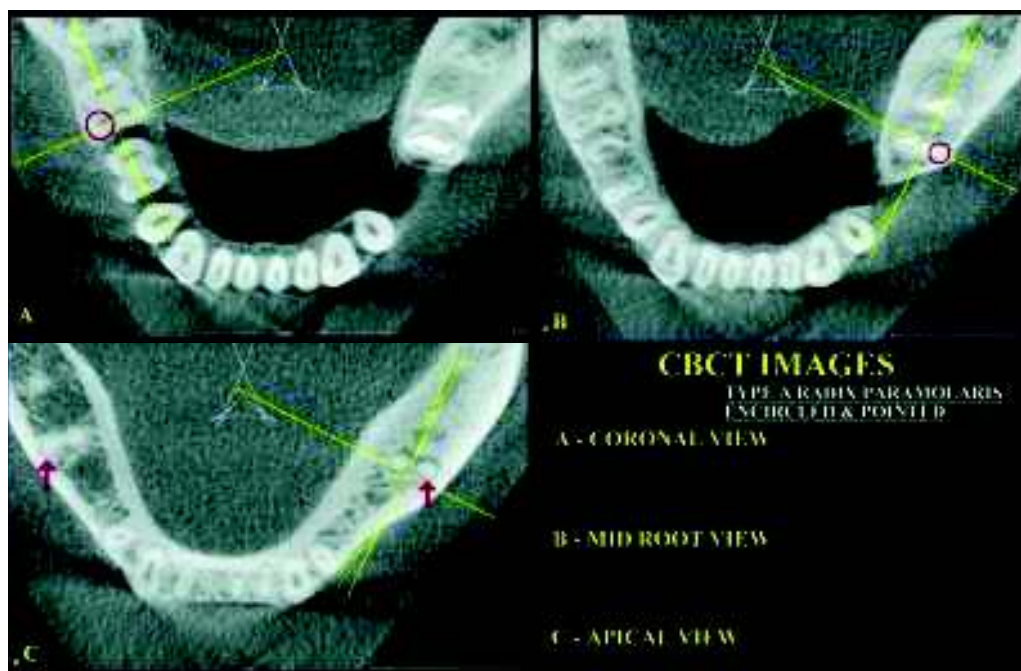


Figure 5: CBCT; arial view in sections

112 However; there are no reports on bilateral radix paramolaris on mandibular first
113 molars in global annals so far. Hence, this could be considered as unique.

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115 **Conclusion**

116 The role of modern technological up-gradation like the CBCT helps in diagnosis,
117 treatment planning and post operative assessment in dentistry. Routine use of such
118 recent technologies can only aid the clinicians in better oral health care for the needy.

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123 **CONSENT**

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125 All authors declare that 'written informed consent was obtained from the patient for
126 publication of this case report and accompanying images.

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129 **ETHICAL APPROVAL**

130

131 **Ethical Statement**

132 All the authors comply with the fact that ethical clearance has been taken for this
133 submission including patient consent.

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