



CASE REPORT

ENDODONTIC TREATMENT OF BILATERAL MANDIBULAR SECOND MOLARS WITH SINGLE CANAL.

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ABSTRACT:

Anatomical variations are commonly encountered during Endodontic treatment. However, its common for the clinician to search for extra canals than treat less than the number usually encountered. Lack of knowledge could lead to overzealous drilling and complications. This case report illustrates the occurrence of single canal in mandibular second molar and the use of Cone Beam Computed Tomography (CBCT) as a diagnostic adjunct to confirm the canal anatomy.

Key words: APEXIFICATION, Cone Beam Computed Tomography,

CASE REPORT:

A female patient 35 years old, with a non contributory medical history reported to the Department of Conservative Dentistry and Endodontics, with pain in his lower left and right molar teeth. The pain was spontaneous, increased on lying down and present for the past 5 days. Clinical and radiographic (Figure 1) examination revealed deep carious lesion in the right second mandibular molar (47). Vitality testing with dry ice (R C Ice, Prime Dental) caused severe lingering pain. A diagnosis of symptomatic irreversible pulpitis was made. The right first mandibular molar (46) showed a previous obturation, also revealed separated instruments in the mesial root and substantial loss of coronal tooth structure. On patient's insistence it was decided to extract the tooth (46) and endodontic treatment was planned for the second molar (47). The patient complained of similar complaint on the left lower side. Clinical and radiographic examination revealed the presence of an access opening in the left second mandibular molar (37). The left mandibular first molar (36) was missing and the history confirmed an extraction done about 6 months back. (Figure 2) Endodontic treatment was planned for the mandibular left first molar. The treatment plan was explained to the patient, and an informed verbal and written consent was obtained.



Figure 1



Figure 2

Investigations: In addition to Intra Oral Periapical Radiographs (IOPA), CBCT (Cone Beam Computed Tomography) was used to visualize the root canal anatomy. Interestingly, the images revealed that the right and left mandibular second molar had a similar morphologic variation of having a single root with a single canal. The canals in both the teeth were uniformly oval in shape. (Figure 3)

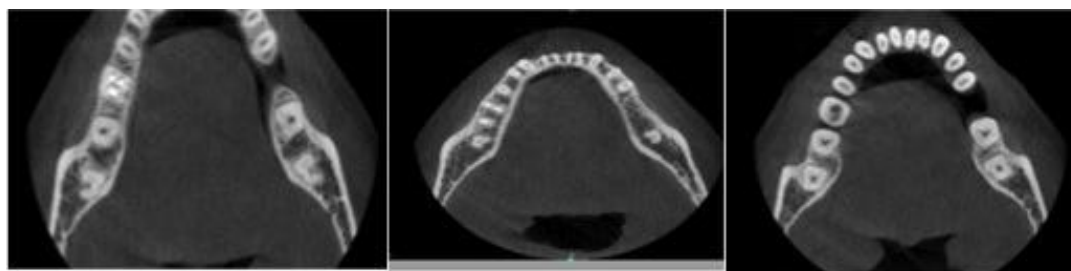


Figure 3

Treatment: Local anesthesia was achieved by administration of inferior alveolar nerve block with 2% lidocaine the second molar was isolated under rubber dam (Hygenic- Coltene Whaledent). Following excavation of caries an access cavity was prepared with Endo Access bur FG2 (Dentsply Maillefer, Switzerland). A single orifice was located. Further examination with a DG 16 explorer (Hu Freidy, USA) failed to reveal any additional orifices. Working length radiograph confirmed the presence of single canal (Figure 4), the length was further confirmed with the help of apex locator (Root ZX-J Morita). Conventional instrumentation was done with K- files (Mani, Japan), using EDTA (Dentsply Maillefer, USA) as lubricant . An apical preparation till 40 no (2 %) was carried out. Circumferential filing was done with H- files. The canal was irrigated using normal saline and 3% sodium hypochlorite (Vishal Dental products, India). Sodium hypochlorite was agitated by means of Endo activator (Dentsply Tulsa) medium tip (25- 04%). After confirming the master cone (Dentsply, India) by radiographs the canal was dried using paper points (Dentsply, India) and obturated using AH plus (DeTrey/Dentsply, Germany) as sealer (Figure 5). A temporary dressing (Cavit G, 3M ESPE , Germany) was placed and a radiograph taken to confirm the obturation (Figure 3). The patient was recalled after a week and was found to be asymptomatic. Similarly the contralateral tooth (37) was also treated (Figure 6). The patient has been followed up for three months after Endodontic treatment and found to be completely asymptomatic. Full coverage restorations have been planned. The



Endodontically treated teeth would also serve as abutments to fixed partial dentures for replacement of the adjacent first molars.

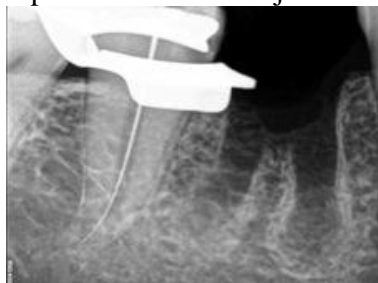


Figure 4



Figure 5



Figure 6

DISCUSSION:

Tamse et al. [2] reported the occurrence of bilateral symmetry in 89.65% of cases with single conical rooted mandibular second molar. Manning investigated the anatomy of mandibular second molars and found that 22% had one root, 76% had 2 roots and 2% had 3 roots.[3] Pansiera & Milano [4] studied 102 extracted human mandibular second molars and described six teeth (5.88%) possessing one root and one root canal.

Sabala et al., [5] stated that the more rare the aberration, the more probable that it was bilateral. As bilateral anatomic discrepancies are usually found, the clinician should suspect its presence on the contralateral pair when viewing the initial radiograph.

The use of Computed tomography (CT) for Endodontic applications was reported by Tachibana and Mastumoto in 1990.[6] limited use in endodontics because of inadequate image detail and high cost. Cone beam computed tomography uses a cone shaped beam instead of the regular fan shaped one, and has become a popular adjunct to intra oral radiography to study root canal anatomy.

Matherene Ryan et al in his in vitro study of 72 extracted teeth investigated the use of cone beam computed tomography (CBCT) as a diagnostic tool for identifying root canal systems and comparing it with images obtained by using charged couple device (CCD) and photostimulable phosphor plate (PSP). When compared with CBCT, Endodontists failed to identify one or more root canals in 41% of the teeth with CCD and 40% of the teeth with PSP.[7]



In an in vitro study done by Reuben et al. [8], in an Indian population, out of 125 samples of mandibular first molars evaluated using spiral computed tomography only one sample had a single root and single canal.

In the present case, multiple angulated radiographs indicated the presence of single root and single canal in both the mandibular second molars. The root canal morphology was further confirmed with CBCT.

REFERENCES:

1. Schäfer E, Breuer D, Janzen S. The prevalence of three-rooted mandibular permanent first molars in a German population. *Journal of endodontics* 2009; 35(2): 202-05.
2. Tamse A, Kaffe I. Radiographic survey of the prevalence of conical lower second molar. *Int Endod J* 1981;14(3):188-90.
3. Manning SA. Root canal anatomy of mandibular second molars. Part 1. *Int Endod J*. 1990;23:34-39.
4. Pansiera AF, Milano NF. Morfologia endodôntica dos segundos molares inferiores. *Revista da Faculdade de Odontologia de Porto Alegre*. 1995; 36: 12-14.
5. Sabala CL, Benenati F, Neas BR. Bilateral root and root canal aberrations in a dental school patient population. *Journal of Endodontics*. 1994; 20: 38-42.
6. Tachibana H, Matsumoto K. Applicability of X-ray computerized tomography in endodontics. *Endod Dent Traumatol*. 1990; 6:16–20
7. Ryan P, Matherne, Christos Angelopoulos, James C. Kulild, Daniel Tira. Use of Cone-Beam Computed Tomography to Identify Root Canal Systems In Vitro. *J Endod* 2008; 34 :87-89
8. Reuben J, Velmurugan N, Kandaswamy D. The evaluation of root canal morphology of the mandibular first molar in an Indian population using spiral computed tomography scan: an in vitro study. *J Endod* 2008; 34: 212– 15.