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Case Report

DIAGNOSIS AND TREATMENT OF A MANDIBULAR PREMOLAR TOOTHWITH 3 ROOTS AND CANALS - A CASE REPORT

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ABSTRACT

The anatomy of the root canal system determines the parameters under which the endodontic treatment will be accomplished and directly affects the success of the root canal treatment. Mandibular premolars have great variability in their internal morphology due to the possible presence of more than one root canal. This paper presents a case report of a mandibular second premolar with three canals and three different apical foramina. The intraoral clinical examination revealed a tooth affected with deep proximal caries. The radiographic examination showed the presence of three roots. The probable diagnosis was an acute irreversible pulpitis. Complete root canal treatment was carried out and the patient was periodically evaluated for prognosis.

Keywords: 3 Canal Anatomy, Mandibular Second Pre Molar, Anatomical Variations of Teeth, Root Canal Anatomy.

INTRODUCTION

Success in Endodontics is achieved by effective debridement and good obturation; all this can be achieved with through knowledge of rootcanal system. The anatomy of the pulp space decides the parameter with which root canal therapy will be carried out and its success. Root canal variations pose a challenge for the clinician.

According to Weine1(1995), the major causes of endodontic failure are incorrect canal instrumentation, incomplete obturation and untreated major canals. According to Cohen & Brown(2002)[2] failure to recognize the presence of an additional canal may result in unsuccessful treatment and may be the origin of acute flare ups during and after treatment Anatomical variations of mandibular premolars have been documented in endodontic literature. A single canal has been reported to occur from 65.7 to 100% (Pineda & kutler 1972, Vertucci1978, 1984) & Zillich & Dowson1973)[3-6].The highest reported frequency of a second canal in second pre molar was reported

as 1.2 to 11.7% yang et al(1988)[7]. Tzanetakis et al[8] reported that the incidence of two or more canals in the mandibular second premolar can range from 1.2 to 34%. and an incidence of 0.4% of mandibular second pre molar with three root canals[6]. Al Fouzan (2001)9 has reported cases of unusual anatomy of mandibular second premolar with four and five root canals respectively. This paper discusses a case of an endodontic treatment performed in a mandibular second premolar with three canals and three different apical foramina.

CASE REPORT

A 33 year old female patient reported to Department of Conservative Dentistry & Endodontics SDS, Karad with chief compliant of continuous pain in lower left posterior region. Pain was of continuous nature and aggravated with presence of stimulus. Radiographic examination revealed presence of deep caries with involvement of pulp and changes in peri apical region. The preoperative periapical radiograph showed the presence of three canals fig-1.The probable diagnosis was an acute irreversible pulpitis with apical periodonitis and the endodontic treatment was indicated. The access cavity was prepared with round diamond points and caries completely excavated. After reaching the pulp chamber the roof was removed and the lateral walls were prepared. Mesial and distal canals were located with #08 and #10 K-files (Dentsply / Maillefer) fig-2. Exploration following the dentin map confirmed the presence of three root canals: mesio buccal, disto buccal and lingual. The pulp was extripated, canals were

irrigated with 2.5% sodium hypochlorite and the working length was determined using the Root ZX apex locator (J. Morita, Tokyo, Japan). All three canals were prepared using RevoS SU with copious irrigation alternatively with sodium hypochlorite 2.5% and saline fig-3 .subsequently canals were obturated with 25 6% gutta percha points (Dentsply /Maillefer) using AH plus as sealer (Dentsply Maillefer) fig-4.The access filling was done with composite resin and full PFM bridge cemented.

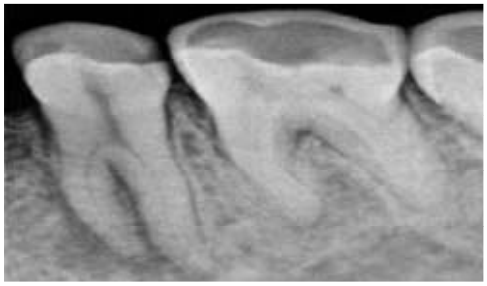

Figure 1: Pre operative radiograph

Figure 2: Microscopic view of access opening

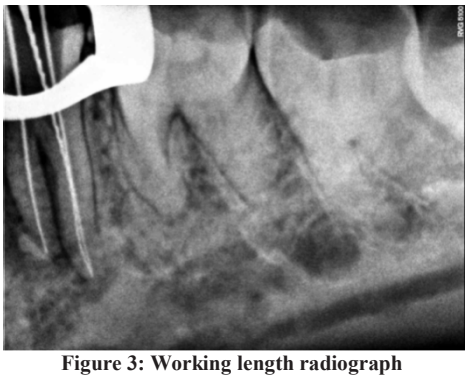

Figure 3: Working length radiograph

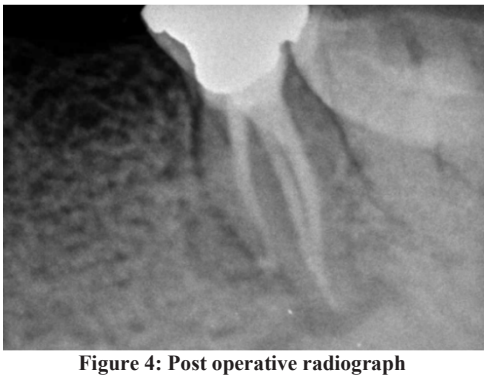

Figure 4: Post operative radiograph

DISCUSSION

The possibilities of complex nature of root canal morphology of mandibular second premolar should be thoroughly understood. Radiographs are excellent diagnostic tools. Preoperative radiographs are helpful to identify anatomical alterations of the root canal system. The analysis of the dentin map of floor of pulp chamber can also help identifying variations thus, facilitating the proper location of all root canals10. During radiographic examination, a careful interpretation of the periodontal ligament space (Fig1) could suggest the presence of an extra root or canal. In the present case, it can be clearly seen presence of two buccal roots (Fig 1). The radiolucent space uniformly disappears from the pulp chamber, suggesting a possible presence of an additional canal [10-12]. A good access cavity preparation is necessary. Smaller K files of size#6,
#8, #10 are initially used for canal negotiation. Endo micro scopes are very useful for locating difficult canal orifices.
Pre flaring of the coronal portion of root allows a correct determination of the initial apical file and a better cleaning and shaping of the apical third of root canal and obturation of the root canals [13-15].The working length was determine using the Root ZX apex locator (J. Morita, Tokyo Japan) which is helpful in determining the correct working length. Exact point where the root or the canals divide should be noted, in the present case the roots
divided from the coronal third of the root. The existence of complex variations of root anatomy makes root canal treatment a challenging situation for clinician. Other diagnostic aids like usage of dyes, computed tomography and MRI should be considered as aids for diagnosis and to achieve high success rates.

CONCLUSION

The anatomy of mandibular pre molar has complex variations. Knowledge of pulp space anatomy, clinical experience, use of operating microscopes has made treatment of difficult cases easier. Each case should be carefully examined clinically and radiographically for additional of canals in order to achieve good results in treatment.

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