

CASE REPORT

DIAGNOSIS AND ROOT CANAL TREATMENT OF MANDIBULAR 2ND PREMOLAR WITH TWO ROOTS -A CASE REPORT

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ABSTRACT:

Abnormalities in the root canal anatomy are commonly occurring phenomenon. A thorough knowledge of root canal anatomy and its variation is necessary for successful completion of endodontic treatment. Mandibular premolar is known for having aberrant anatomy. Often considered an enigma to endodontists, the mandibular premolar with dual canal dividing at various levels of the root can generate complex mechanical problems. The role of genetics and racial variations may result in difference of incidence of root number and canal number. This paper attempts at explaining a rare case of successful endodontic management of two rooted mandibular 2nd premolar with awareness of data pertaining to number of canals, knowledge of canal morphology, correct radiographic interpretation and tactile examination of canal wall which are important in detecting the presence of multiple canals.

Key Words - Mandibular second premolar, two roots, Modified access cavity

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INTRODUCTION

Knowledge of common root morphology and its frequent variations is a basic requirement for endodontic success. While treating each tooth the clinician must assume that complex anatomy occurs often enough to be considered normal. There are evident indications that root canal morphology is almost limitless in its variability. The unusual number of canals should always be expected in various teeth. Untreated root canals may cause failure of the treatment. Mandibular 2nd premolar are known to have a single canal. According to EL-DEEB the mandibular premolar may show wide variation in their root canal anatomy¹. The recognition of atypical anatomy is important. Various reports of root canal variation in these teeth have been reported in the literature.^{2, 3} Vertucci in his series of studies conducted on extracted teeth, reported 2.5% incidence of 2nd canal.⁴ Zilich and Dawson reported 11.7% occurrence of two canals.⁵ Three canal were found in .2% of teeth studied the role of genetics and racial variation may result in difference of incidence of root number and canal number. Higher incidence of teeth with additional canals and roots have been reported in Chinese, Australian, lowest incidence seen in Japanese. A study of 45 X chromosome

females in Finland found more than 1 canal in one or more of mandibular premolar in almost half of 87 patients studied. The study concluded that X chromosome has a gene or genes with regulatory function in root development.

CASE REPORT

A female patient aged 40 years old was referred to the endodontic department of National dental college for management of lower right second premolar. History revealed that patient had experienced sensitivity to cold and hot for past two months and reported pain for past 20 days. Pain was spontaneous in nature and aggravated on food impaction. Tooth exhibited carious exposure of pulp. The tooth was subjected to routine clinical tests and a provisional diagnosis of acute irreversible pulpitis was made (Figure 1). Periapical radiograph revealed bifurcation at level of middle third of root. Canal configuration was categorised as type III according to WEINE classification.

ENDODONTIC INTERVENTION

Under local anaesthesia, access was gained with number 4 round bur in air turbine hand piece. Both mesial and distal canals were negotiated with S.S

10 k file. Subsequent to irrigation with 5.25% sodium hypochlorite, S.S 15 k file was used with watch winding motion to create a glide path for both canals. Working length radiograph was taken which was 19 mm (Figure 2). Canals were sequentially irrigated using 5.25% sodium hypochlorite and 17% EDTA during cleaning and shaping procedure. Biomechanical preparation was done and calcium hydroxide intracanal medicament was placed inside the canal. In next appointment canals were cleaned once again with 5.25% sodium hypochlorite and 17% EDTA and normal saline. The canals were thoroughly dried and obturation was done using standardized 2% gutta percha and zinc oxide eugenol sealer. Occlusal access opening was sealed with temporary filling and final radiograph was made (Figure 3). The patient was reviewed for 1 week and post endodontic permanent restoration was completed with amalgam (Figure 4).



Figure 1



Figure 2

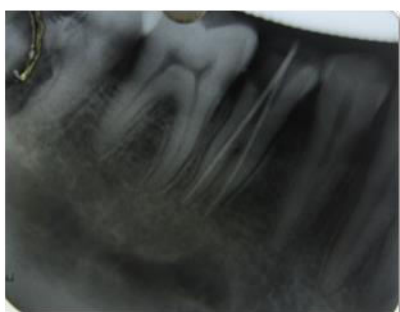


Figure 3

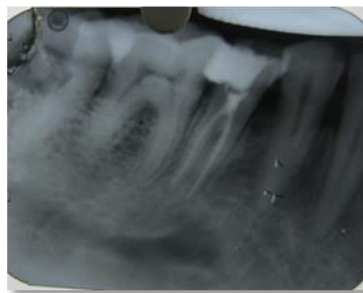


Figure 4

DISCUSSION

A university of Washington study assessed the failure rate of non surgical RCT in all teeth⁶. It was highest for mandibular premolar at 11.45%. The possible reason for high failure rate are the numerous variations in root canal morphology and difficult access to second canal potentially resulting in a missed canal⁷. The clinicians must be familiar with various pathways root canal take to the apex. The pulp canal system is complex and canals may branch, divide and rejoin. According to anatomic studies almost all second premolars were single rooted (99.6%). The incidence of two root (.3%) and 3 roots (.1%) was extremely rare. The pulp chamber has two pulp horns, the buccal horn being most prominent. In cross section chamber is oval with greatest dimension buccolingually. In the very comprehensive classification by Vertucci, the number of canals is differentiated into those that (1)begin at the floor of pulp chamber (2)emerge through course of canal (3)open at apical foramen. These findings are very important. Failure to recognise these findings often leads to acute flare up during treatment and subsequent failure of endodontic therapy. A review of literature has revealed the human mandibular 2nd premolar have extremely complex root canal morphology, however the multiple roots and canals in mandibular second premolar is lower than mandibular 1st premolar⁸.

CONCLUSION

Mandibular premolars are undoubtedly an endodontic challenge because of the presence of extra canal which may occur far too often than one canal. A thorough knowledge of root canal anatomy, careful interpretation of radiograph and proper modification of conventional access opening seems to be essential for recognition and adequate treatment of teeth with different anatomical variations.

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