

CASE REPORT: MANDIBULAR CANINE WITH 2-1 CONFIGURATION

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ABSTRACT

Endodontic treatment success is largely dependent on the clinician's understanding of and aptitude for dealing with atypical anatomy. The mandibular canine typically has one root and one canal, however, 15% of individuals may have two canals and one or more foramina, and even fewer individuals may have two roots. In this paper, a clinical case is reported of a mandibular canine with two root canals that converge into a single canal and one foramen.

Keywords: Endodontic management, mandibular canine, Vertucci type-II configuration.

INTRODUCTION

Knowing the various anatomical configurations of the root canal system is necessary for endodontic practice. The success of Root Canal Treatment (RCT) commonly depends on the understanding of root canal configurations and the evaluation of preoperative radiographs. Mandibular canines are among the permanent teeth whose root canal morphology has been studied in previously published studies. There was a lot of variability in the reported root canal morphologies in permanent mandibular canines among different researches. The inability to find additional root canals plays a big part in endodontic treatment failure.¹

One canal is present in almost all of the mandibular canines. However, it has been noted that 15% of mandibular canines show two canals consisting of one or two foramina.

Despite the low likelihood of anatomical diversity in teeth, a detailed understanding of both the internal and external architecture of teeth is necessary for the clinician to perform a successful endodontic procedure. This article will elaborate on the identification and endodontic management of a mandibular canine with Vertucci's type II i.e two-one root canal configuration².

CASE REPORT

A 35 year old female reported to the department of conservative dentistry and endodontics of Rama Dental College with the chief complain of pain in lower right mandibular anterior tooth. Patient had no relevant medical condition. Past dental history revealed multiple root canal treatments and fixed partial prosthesis. The discomfort continued to bother her while she slept. Upon clinical examination, caries was detected lingually and distally, pain lingered for few minutes even after removal of thermal stimulus and tenderness on percussion was observed in the mandibular right canine. The electric pulp test produced almost no response. Two canals with one root were visible on intraoral periapical radiographs collected at various horizontal angulations. A clinical diagnosis of chronic irreversible pulpitis with symptomatic apical periodontitis was made and root canal therapy was recommended. The patient's written informed consent was acquired before the treatment was scheduled and started.

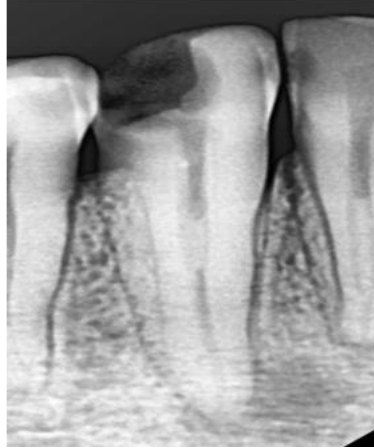


Figure 1: Pre-Operative Radiograph

Local anaesthesia was administered and the entire procedure was performed under a rubber dam. The access opening was prepared with an endo access #1 round diamond bur and endo-Z tapered safe-end bur (Figure 2). After reaching the pulp chamber we found that there were two canal orifices on the floor of the pulp chamber, merged into one single canal at apical third . An apex locator(Tri Auto ZX2, J Morita; USA) was used to measure the working length, and radiographs were used to confirm the measurement (Figure 3). It was found that the lingual and buccal canals only joined at the apical third of the root (Vertucci Type II configuration of the root canal). The canals were cleaned and shaped with ProTaper Gold rotary files (Dentsply Tulsa Dental Products, USA) up to F2.

Figure 2: Access opening showing two orifices in the maxillary canine.



Figure 3: Working length Determination

After each filing, 5.25% sodium hypochlorite and 17% ethylene diaminetetraacetic acid (EDTA) were used to disinfect the canals. Using the warm vertical compaction technique, the root canals were obturated with gutta-percha cones and AH-Plus sealer after being dried with paper points. The access preparation was thereafter restored with composite resin (Figure 4).



Figure 4: Post-obturation Radiograph

DISCUSSION

It is well known that the incapacity to locate and fill a canal is the reason nonsurgical endodontic therapy fails. During the endodontic therapy, each canal's location and management are very important^{1,3}. They can typically be found if the doctor pays attention to the indicators that indicate the presence of additional canals⁴.

Through a comprehensive radiographic evaluation, a clinical endodontic inquiry, or even with the use of magnification or a dental operating microscope, it may be possible to find or potentially find more canals. With a file in place, radiographs taken from different angles may help find and detect more canals. Furthermore, a clinical assessment of the pulp floor and an examination of the closeness of the two canal orifices are required. The distance between the orifices increases the possibility of the two canals merging within the root's body⁵.

Before obturation, endodontic therapy aims to remove any remaining pulp tissue, bacterial products, and microbes from the root canals. This provides an optimum environment for periradicular tissues to heal. Endodontic treatment has been demonstrated to fail due to an inability to detect and fill a canal⁶.

Finally, the presentation of this case will increase clinicians' understanding and provide light on anatomical variations in tooth anatomy. It highlights the importance of exercising vigilance when detecting and treating any additional canal.

CONCLUSION

Although it is extremely rare for mandibular canines to have two canals, doctors must be constantly aware of variations in the number of roots and canals in order to provide appropriate care to such patients.

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