

Case Report

Endodontic management of an unusual case of mandibular second molar with 5 root canals

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Abstract

Although the presence of three root canals is the most common configuration of mandibular molars there are many other configurations. Though there are many reports of mandibular first molars with 5 canals, it is very rarely seen in the mandibular second molar. This report presents a case of unusual root canal morphology of the mandibular second molar with 5 root canals and its endodontic management.

Keywords: mandibular second molar, middle mesial canals, missed canals, root canal anatomy

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Introduction

Good knowledge of tooth anatomy is fundamental to the success of root canal treatment. The failure of identifying the presence of an anatomic variation may compromise the success of the treatment.¹

Most common configuration of mandibular second molar reported it to be a two rooted tooth with three root canals.^{2,3} Variations in anatomy in these teeth are reported in literature, studies have reported presence of C-shaped canal systems in mandibular second molars.^{4,5}

In 1974, Vertucci, Williams and Barker et al. described presence of middle mesial canal.^{6,7} The middle mesial canal has been more commonly located in mandibular

first molars and rarely in mandibular second molars.^{8,9} However presence of 5 canals in the mandibular second molar is very rarely reported. Identification and treatment of all root canals is important for the success of root canal treatment. The aim of this paper is to show unusual mandibular first molar anatomic configurations with a presence of 5 root canals.

Case Report

A 24-year old male presented to an emergency endodontic appointment with a chief complaint of spontaneous pain, and increasing pain to temperature variations

in the mandibular right side. The medical history was non-contributory. A clinical examination revealed a carious lesion on the occlusal surface of mandibular second molar (tooth 47). On electric and ice sensibility test, an intense pain was elicited that remained present for more than one minute. The adjacent teeth had a normal response to this test. The preoperative diagnostic radiograph of the tooth revealed a deep, carious lesion approaching the pulp chamber with no sign of periapical radiolucency (Figure 1). The diagnosis was an irreversible pulpitis on tooth 47 and endodontic therapy was proposed.



Figure 1: IOPA Radiograph revealed a deep, carious lesion approaching the pulp chamber with no sign of periapical radiolucency

After proper anaesthesia and rubber dam isolation, the access cavity was prepared (Fig 2). During the exploration of the pulp chamber floor it was possible to identify five canal orifices: three in the mesial root (MB, MM and ML canals) and two in the distal root (DB and DL canals). After measuring the working length using an electronic apex locator and verified radiographically (Figure 3), the rotary instrumentation was finished to an F2 Protaper in the mesial canals and with an

F3 file in the distal canals. After bio-mechanical preparation, the canals were dried and filled with a calcium

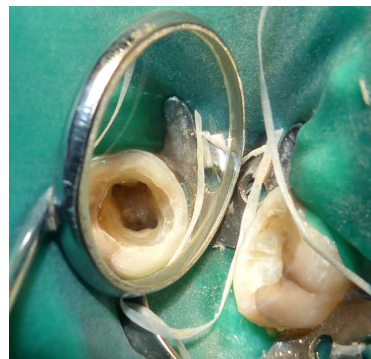


Figure 2: Tooth showing access cavity.

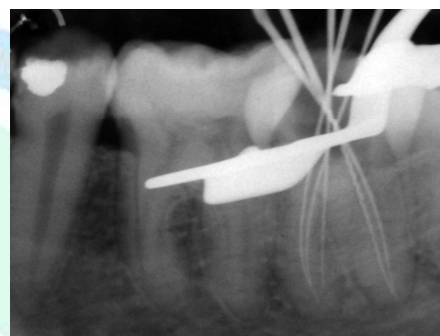


Figure 3: Radiograph showing verification of working length using an electronic apex locator

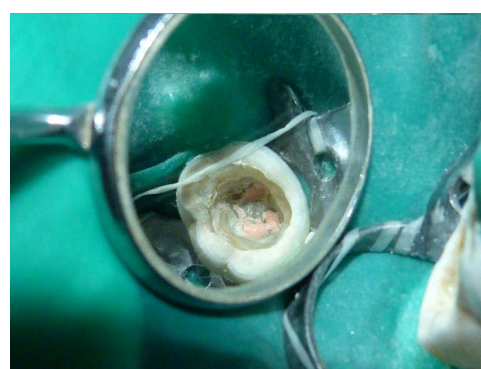


Figure 4: Mirror view of tooth showing root canal obturation



Figure 5: IOPA radiograph showing root canal obturation

hydroxide paste. The access cavity was provisionally restored. At the second visit, two weeks later, the root canal obturation was performed (Figure 4 and 5) and the tooth was restored. On one year follow up review, patient had no complaints and the tooth remained asymptomatic.

Discussion

The human dental pulp takes on numerous configurations and shapes. Successful endodontic treatment depends on entering the pulp chamber, cleaning, shaping and obturating the canal system. Each of these procedures is very important, but any anatomical variation that is present in any of the teeth needs to be detected in order to avoid failure of the canal treatment.

Middle mesial or multiple canals in the mesial root of mandibular molars have been reported in the literature as having an incidence of 2.07% up to 13.3%.^{6,10} The canals may be independent throughout their course in the root with an apical opening of their own, or they may join either of the two or more common main canals.

In the reported case MM was only identified after exploring the anatomic grooves. Modifying the access cavity and exploring the grooves and opening them using an ultrasonic troughing

technique had proved helpful on locating extra canal. With proper treatment, the prognosis for this tooth should be considered the same as that of any other mandibular molar

Conclusion

The clinical case, presented in this article, demonstrates that morphological variations of mandibular second molar may occur. Therefore, it is important that before beginning any kind of endodontic treatment all clinicians must take into account the possible dental anatomical variations to help them prevent the failure of treatment.

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