



AN UNUSUAL OCCURRENCE OF A MANDIBULAR 1ST MOLAR FEATURING 6 CANALS

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Abstract

Recently, documentation highlighting the prevalence of over 4 root canals in mandibular 1st molars has emerged. While treating mandibular 1st molars that require endodontic treatment, clinician should be cautious. Furthermore, radiographic evaluation should be viewed as a tool for obtaining clues rather than a definitive reference to anatomy as well as its accompanying anomalies. The non-surgical endodontic therapy of a mandibular 1st molar having six root canals, 3 in each mesial & distal root, is described in this case. Complete restoration of the tooth was achieved with a composite preceded by a PFM crown after non-surgical endodontic therapy. This specific example contributes to the growing body of knowledge about mandibular 1st molars with six root canals, emphasising the importance of uncommon morphological aberrations in these teeth.

Keywords: Mandibular 1st molar, 6 canals, non-surgical endodontic treatment

Introduction

The aim of root canal therapy is to thoroughly debride & fill the root canals in all respect in order to eradicate or at least lessen the bacterial count in the canals. To facilitate successful root canal therapy, features of atypical root canal shape should be known. The canals should be found, cleaned, formed, and obturated with precision.¹

Many publications on root canal morphology of diverse cultures use genetics to assess & explain the internal complexity of the root canal. Secondary dentin deposits also cause root canal system partitions and substantial differentiations with age, resulting in distinct canals & transverse linking networks.²

Three or four canals are frequently found in the mandibular 1st molar. An accessory mesial canal may exist in this system, with a prevalence ranging from 0% to 17%.³ The existence of six or more root canals, on the other hand, is extremely rare, and such teeth have only been recorded in a few case studies, with their frequency unknown.⁴

The purpose of this research paper is to illustrate how an endodontically treated mandibular 1st molar with 6 root canals was successful.

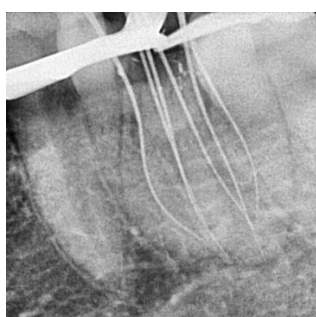
Case Presentation

Food lodgement and sensitivity to heat and cold stimuli were complaints in a 19-year-old female's lower left tooth. She exhibited severe caries on left 1st mandibular molar's distal aspect. The depths of periodontal probing fell under normal range. Negative results were obtained upon percussion, but the thermal tests came out to be positive, with prolonged cold sensitivity, indicating pulp hypermia. The carious lesion was present in very close vicinity to the tooth pulp on periapical radiography.

It was determined that the pulpal hyperaemia was caused by a deep chronic caries. The procedure was explained to the patient. Before beginning therapy, risks and advantages of the procedure were disclosed to the patient, and signed agreements were acquired.



A) Preoperative radiograph



B) Working length



C) Access cavity showing 6 canals



D) Cone fit radiograph



E) Post-obturation radiograph showing 6 filled canals



F) Post-Obturation radiograph with PFM crown

Treatment

Procedure was started under local anaesthesia (1.5 ml 2% lignocaine with 1:80,000 adrenaline) & isolation with rubber dam. 2% chlorhexidine gluconate was used to clean the area and traditional coronal access was made. The presence of a carious pulpal exposure and the inability to control bleeding confirmed the pulp's hyperaemic status. The orifices mesiobuccal (MB), mesiolingual (ML), distolingual (DL), and distobuccal (DB) were identified when the pulp chamber was excavated. A comprehensive inspection showed the presence of middle mesial (MM) and middle distal (MD) canals between the previously found canals after probing and cleaning the grooves. Navigation was done using 10 K-file (Dentsply-Maillefer, Ballaigues, Switzerland), and the determination of working length was done with an electronic apex finder (Root ZX Mini, J Morita, California, USA) and periapical radiography. Middle mesial canal was observed joining the principal MB canal in the coronal third. ML, MM, MB, DB, MD, and DL had working lengths of 20, 20, 20, 19, 19, and 19 mm, respectively. In this example, the root canal systems were classified as and Bayirli Sert type XV (3-2) in the mesial and type XVIII (3-1) in distal root. Pulpectomy was performed when the working lengths were determined, and the access was closed using an interim restoration (Temp Paste, PYRAX).

The patient came back for her second visit after seven days. All of the canals were shaped by the ProTaper rotary file system (Dentsply-Maillefer, Ballaigues, Switzerland), and Glyde File Prep (Dentsply-Maillefer, Ballaigues, Switzerland) was used for lubrication. Irrigation with 5% NaOCl was administered at regular intervals. F1 & F2 rotary files were used to completely prepare mesial & distal canals, respectively. After that, the canals were soaked in 95 percent isopropyl alcohol and dried with paper points. Decontamination of gutta-percha points for one minute with 5% NaOCl was done and to eliminate any sodium hypochlorite residue, the points were carefully washed. The root canals were obturated using Sealapex (Kerr Manufacturing Co) sealer. Post-obturation radiographs were taken in all 6 channels to assess the three-dimensional pack. The tooth was repaired with an interim restoration (Temp Paste, PYRAX) following obturation & a coronal build-up was planned for the patient in next appointment.

Discussion

Any differences in the interior structure of teeth must be studied to assure the success of endodontic therapy. 94% of times mesial roots have incidence of 2 canals & 2.3% incidence of a 3rd or mid-mesial canal, whereas 62.7% chances of only 1 distal canal or 37.3% incidence of 2 distal canals are common in mandibular 1st molars. ⁽⁵⁾

From a clinical standpoint, radiographs are the most effective way for doctors to identify changes in root and canal structure. However, the physician may only notice and be aware of alterations before and during endodontic operations by doing a thorough clinical examination and evaluation of these pictures. When considering root canal treatment for mandibular molars, the 3rd mesial and distal canals should clearly be explored and outlined. ⁽⁶⁾

Mandibular 1st molar with three canals each in mesial & distal root is described in this case. In the mesial or distal root, four canals have been observed, however these canals seldom remain distinct, and there are rarely more canals in both roots. Depending on the population investigated, prevalence of a 3rd canal in the mandibular first molar's distal root can vary from 0.2 % to 3%. Early studies of tooth anatomy revealed three distinct canals in the mandibular 1st molar's mesial root only in a small % of cases. ⁽⁷⁾ In several cases, the distal root has been found to contain

several canals. ⁽³⁾ Advanced radiographic technology, such as CBCT, might help detect additional canals, although this was not done in this case. With CBCT, it is possible to have inconsistent results; consequently, caution is advised. ⁽⁸⁾

This instance is being presented to add to the understanding of anatomical diversity of the mandibular 1st molar.

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