

DIAGNOSIS AND TREATMENT OF MANDIBULAR FIRST MOLAR WITH THREE MESIAL ROOT CANALS -A CASE REPORT

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ABSTRACT

The knowledge of the internal anatomy of root canals is very important for the success of endodontic treatment. Variations in dental anatomy are found in all teeth. Lack of knowledge of anatomic variations and their characteristics in different teeth has been one of the main causes of endodontic therapy failure. This case report describes the endodontic treatment of a mandibular first molar with five root canals, its incidence of occurrence and discusses the importance of their identification and treatment.

KEY WORDS: Canal Complexity, Mandibular First Molar, Middle Mesial Canal, Root Canals, Mesial Canals.

INTRODUCTION

The main objective of root canal treatment is thorough cleaning and shaping of the entire pulp space followed by complete obturation with an inert filling material.¹ Knowledge of internal dental morphology is an extremely important step in planning and performing endodontic treatment. Unusual canal anatomy associated with the mandibular first molar has been reported in several studies. Favieri et al have reported that numerous anatomical variations existing in the root canal system may contribute to the failure of root canal therapy.² The endodontic treatment of a mandibular molar with aberrant canal configuration can be diagnostically and technically challenging. There have been numerous studies that describe the morphology of all teeth, including mandibular first molars. Skidmore and Bjorndal, Pineda and Kuttler, and Vertucci^{1,3,4} have all reported on the morphology of the mandibular first molar. Their reports have shown that mandibular first molars have three or four canals. Martinez-Berna A, Badanelli P⁵ have reported presence of six canals in mandibular first molar. Reeh⁶ has even reported a case with seven canals, consisting of four canals in the mesial and three in the distal root. Baugh D,

Holtzmann L, Navarro LF⁷⁻¹⁰ have described the presence of middle mesial canal in the mandibular first molar that includes the presence of three canals in the mesial root. With increasing reports of aberrant canal morphology, the clinician needs to be aware of variations in tooth anatomy. The purpose of this article is to report the successful treatment of an mandibular molar with three mesial and two distal canals.

Case Report

A 35 year old female patient reported to Department of conservative dentistry and Endodontics, Darshan Dental College and Hospital with history of dull pain and swelling in tooth 36 since one week. History of dull pain and food lodgment since one year. Radiographic examination revealed proximal caries with furcation involvement and diffuse periapical radiolucency involving furcation, diagnosis of periapical abscess was made and patient was advised to undergo root canal treatment followed by crown. Access opening was made caries excavated and canals were located(**Fig.1**). The working lengths were estimated



Fig.1. :Pre-operative Radiograph



Fig.2. : Working Length Radiograph



Fig.3. : Obturation



Fig.4. : post operative Follow-up-1 month.

using #8, #10 and #15 k file and confirmed using an apex locator (Root ZX, J.Morita, Tokyo, Japan). Three separate mesial root canals and two distal canals were confirmed with a radiograph (**Fig.2**). The canals were prepared with hand protaper files (Dentsply, Maillefer, Switzerland) and the canals were obturated with protaper gutta percha points using AH plus as sealer (Dentsply, Germany) using the lateral condensation technique (**Fig.3**). The crown was restored with composite resin and patient recalled after one month to check for prognosis (**Fig.4**).

Discussion

The mandibular first molar is first tooth to erupt, the most heavily restored tooth and also a common tooth to under go root canal treatment in the adult dentition. Normally mandibular first and second molars have two roots, one is mesial and the other is distal, and at least three main canals. The

knowledge of both the normal and abnormal anatomy of molars shows the parameters under which root canal therapy has to be performed and can directly modify the probability of success. Knowledge of all such variations help in location and management of such cases because inability to find and properly treat the root canals may cause failures. The Endodontist must be familiar with all abnormalities as well as their percentage in order to achieve success. Many authors agree on the presence of three foramina in the mesial root but few report three independent canals, which presents itself as a rare anatomical variant^{10,11}. 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% of the examined cases^{12,13,14}. In the present case all the mesial canals had separate orifice and apical exit. The DG 16 endodontic explorer and pathfinder help to determine the canal orifices and canals. The search for an extra orifice is also aided by the use of magnifying loupes and Operating microscopes which help in providing enhanced

visualization of root canal intricacies which help in canal location, cleaning and shaping. Success in Endodontics requires a careful clinical and radiographic inspection. The present case indicates that each case presented for root canal treatment should be carefully evaluated radiographically and clinically. Adequate time should be spent on exploring the floor of pulp chamber which will help to locate canal orifices. Knowledge of root canal anatomy and good clinical experiences help us provide good treatment and achieve good prognosis.

CONCLUSION

There are numerous cases published in the literature about the unusual anatomy of the mandibular first molar. Many reports have shown that mandibular first molars have three or four canals. This additional canal may be independent with a separate foramen, or the additional canal may have a separate foramen and join apically with either the mesio buccal or mesio lingual canal. Knowledge of variations of teeth and good clinical skills is one of the key factors in the success of endodontic therapy. The clinician should have adequate knowledge of the incidence of these extra canals in the mandibular first molar. The clinician should perform a thorough examination of the pulp chamber to insure complete debridement of all canals. All these factors increase the chance for long-term success in endodontic therapy.

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