

Aberrant Canal Morphology of Mandibular Premolars- Case Report



Dental Science

KEYWORDS : Taurodontism, aberrant canal morphology

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ABSTRACT

Introduction: Mandibular premolars have gained a reputation for having aberrant anatomy. They are considered to be the most difficult teeth for endodontic treatment.

Purpose: The aim of this study is to investigate a case of mandibular premolar with taurodontism.

Material and methods: The case with taurodontism is described in the following article. Careful exploration of the grooves between all orifices with magnification, use of ultrasonic irrigation; and a modified filling technique are of particular use.

Results: Results are observed after several years. In performing a root canal treatment on such teeth, one should appreciate the complexity of the root canal system, canal obliteration and configuration, and the potential for additional root canal systems.

Conclusions: The proper knowledge of the phenomenon of taurodontism will improve the medical practice of the general dental practitioner.

Introduction

The main goal of root canal treatment is the mechanical and chemical cleansing of the entire pulp cavity, complete obturation with an inert material and coronal filling preventing ingress of microorganisms[6]. To do so, the clinician must have a proper knowledge of the normal root anatomy and of its most common variations. It is very important that all the canals must be located and treated during the course of nonsurgical endodontic treatment.

Mandibular premolars have gained a reputation for having aberrant anatomy. They are considered to be the most difficult teeth for endodontic treatment. One form of aberrant canal morphology for mandibular premolars is taurodontism. The endodontic treatment of a teeth with taurodontism are a real challenge. Patients usually lose their teeth because these anatomical features are less familiar.

The purpose of this article is to present a case for endodontic treatment of mandibular premolars with taurodontism.

Materials and Method

Case with taurodontism of the mandibular second left premolar

A patient (19 years old) is referred to us for endodontic treatment after having been placed a necrotizing agent and an unsuccessful attempt for extirpation of the pulp tissue by a general dental practitioner.

The patient reported pain. A bleeding wide open pulp chamber of the mandibular second left premolar was found while examining the patient. We observed symptoms of pain on probing. The tooth to be treated has a deviation in the tooth position (marginal rotation). The accompanying X-ray shows that it is a rare case with hypotaurodontism of mandibular second left premolar (Figure 1).



Figure 1. Hypotaurodontism of mandibular second left pre-

molar - communication with the dental pulp

The X-ray shows that the mandibular first left premolar is also with taurodontism, but the dental pulp is not affected. Accurate preoperative radiographs, straight and angled using parallel technique are essential in providing root canal anatomy in every case of endodontic treatment[4].

The pulp tissue in the pulp chamber was removed under anesthesia. When looked at under a microscope it was found that a perforation of the distal pulp chamber tooth was made, possibly in an attempt to locate the orifice of the root canal. Probably the reason for the perforation of the pulp chamber is a deviation of the tooth from the position.

Two orifices, vestibular and lingual, were found (Figure 2).



Figure 2. Shaped pulp chamber of tooth 35. The little white arrow indicates the location of the perforation. Bleeding can be seen nearby due to the perforation. The big white arrow indicates the vestibular orifice with a crescent shape.

The shape of the vestibular orifice, as shown in Figure 2, is a crescent, which is an evidence of either a wide large vestibular root canal or possibly a second root canal.

On an X-ray used to establish the length of the root canals two vestibular root canals located very close to each other are well seen (Figure 3).

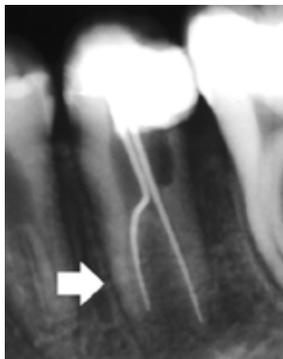


Figure 3. X-ray with gutta percha points in the root canals of tooth 35. The second canal is indicated with a white arrow.

After treatment with rotary nickel titanium instruments using the crown-down methodology and multiple irrigations, the ultrasound activated (according to various literature sources [3,9,12]) root canals were obturated with a Thermafil obturator and a sealer (Figure 4).



Figure 4. X-ray after filling of the mandibular second left premolar.

After obturation of the root canal system a treatment of the perforation in the distal part of the pulp chamber was performed using mineral trioxide aggregate (MTA). A lining of glass ionomer cement was placed at the next visit and the patient was referred to the treating general dental practitioner to place the

final obturation.

Results and discussion

The frequency of taurodontism ranges from 2.9% in 15-35-year old individuals to 37.5% in individuals with hypodontia for Bulgaria population according to Tomov (2010) [11].

Taurodontism is also described as an abnormality associated with a common disease, but in this case such disease is not found [10]. Nowadays, it is assumed that taurodontism is an anatomical variation that occurs sporadically in the human population [7].

Sometimes locating, cleaning and filling root canals of teeth with taurodontism creates major problems. Individual approach, precise planning and implementation of health activities are essential for the endodontic result [2, 5,8].

It is necessary to work under anesthesia rather than with devitalizing agents, as heavy bleeding may occur. Moreover, it is risky to make perforation when detecting root canals [12]. It is recommended to use passive ultrasonic irrigation with hypochlorite for irrigation (no irrigation with syringes), because the volume endodont contains greater amount of infected channel contents and extrusion of debris or irrigant is possible. A combination of lateral and vertical condensation [1] is required for the successful filling of the root canal system.

During root canal anatomy of taurodont teeth, the clinician should appreciate the complexity of the root canal system, canal configuration, and the potential for extra roots and canals.

It is important to recognize and diagnose teeth with taurodontism for the successful treatment of such cases. This gives a good estimate of the treated teeth and may prevent complications.

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