ABSTRACT

Introduction: There are cases in the endodontic treatment which are a real challenge. There are teeth with taurodontism and radix entomolaris. Patients usually lose their teeth because these anatomical features are less familiar.

Purpose: The aim of this study is to investigate several cases with taurodontism and radix entomolaris.

Material and methods: Two cases with taurodontism and one with radix entomolaris that are 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: Knowledge of the phenomenon of taurodontism and radix entomolaris will improve the medical practice of the general dental practitioner.

Key words: Anatomical variation, taurodontism, radix entomolaris, endodontic treatment

INTRODUCTION

The endodontic cases for treatment can be conditionally divided into: simple, moderately difficult and difficult. The group of difficult cases concerns the aberrations of dental roots - taurodontism; C-shaped configuration of the pulp chamber and the root canal system; radix entomolaris of first mandibular molar; dens evaginatus and dens ivaginatus.

The purpose of this article is to discuss some difficult cases for treatment in the endodontic practice in order to foresee and prevent complications. Such are rare cases of taurodontism of lower premolars and radix entomolaris of the first mandibular molar.

MATERIAL AND METHODS

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.

A bleeding wide open pulp chamber of the mandibular second left premolar was found while examining the patient. The patient reported pain and 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).

Fig. 1. Mandibular second left premolar with hypotaurodontism and 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.

Taurodontism is also described as an abnormality associated with a common disease, but in this case such disease is not found [13]. Nowadays, it is assumed that taurodontism is an anatomical variation that occurs sporadically in the human population [10].

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. Two orifices, vestibular and lingual, were found (Figure 2).
Fig.2. “C” 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).

Fig.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 [4, 11, 14]) root canals were obturated with a Thermafil obturator and a sealer (Figure 4).

Fig.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 filling (obturation).

Case with taurodontism of the mandibular first right premolar

Endodontic treatment of the mandibular first right premolar was conducted on a 32-year old patient. The tooth was with a destroyed clinical crown, periapical changes (chronic granulomatous diffuse periodontitis PAI 2) and a deviation in the tooth position (marginal rotation). The X-ray showed that it was a rare case of tooth with hypotaurodontism. Endodontic treatment was completed with a filling with cold lateral condensation. The post endodontic recovery was with a post (February 2005). Due to the tooth rotation the control X-ray for filling is made with medial displacement of about 30 degrees (Figure 5).

Fig.5. X-ray after filling of the mandibular first right premolar with hypotaurodontism.
We observed an intact periapical bone and excellent healing results (Figure 6) after seven years, at a radiography check-up of the same tooth 44 - mandibular first right premolar with a normal centering,

**Fig.6.** Mandibular first right premolar with taurodontism 7 years later.

When a rectangular or a trapezoidal pulp chamber is identified on the X-ray, it is difficult to locate the orifices connected to radix entomolaris. This is the tooth treated by us and presented on a preoperative radiograph in Figure 8.

**Fig. 8.** X-ray of the mandibular first molar with radix entomolaris.

The case is difficult because it is difficult for the endodontic clinician to locate the orifice of the radix entomolaris and because of the fact that there is a narrow root canal with a large curvature. A therapy was carried out with the help of nickel titanium instruments using crown-down methodology and multiple irrigations, and the root canals were obturated with a Thermafil obturator and a sealer (Figure 9).

**Fig.9.** X-ray of the root canal filling of the mandibular first molar with radix entomolaris.

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**Case with radix entomolaris of the first mandibular molar**

Another root aberration affecting the mandibular first molar is the radix entomolaris. It occurs infrequently and is difficult for endodontic treatment.

The sixth lingual tubercle in the crown of the first mandibular tooth is considered a sign of such root aberration (Figure 7).

**Fig.7.** Crown of the mandibular first molar with radix entomolaris.
RESULTS AND DISCUSSION

According to G. Tomov (2010) in Bulgaria the frequency of taurodontism ranges from 2.9% in 15-35-year old individuals to 37.5% in individuals with hypodontia [13].

Sometimes locating, cleaning and filling root canals of teeth with taurodontism create major problems. Individual approach, precise planning and implementation of health activities are essential for the endodontic result [2, 7, 8 and 11].

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 [14]. It is recommended to use passive ultrasonic irrigation with hypochlorite for irrigation (no irrigation with syringes), because the endodontic volume 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.

The rare root aberration radix entomolaris is associated with certain ethnic groups. In the African population the frequency of entomolaris is 3% while in Europeans the frequency is less than 5% (3.4% to 4.2%). In the Mongoloid race the frequency is more than 5% and may reach more than 30% (Chinese, Eskimos and American Indians). Radix Entomolaris is considered normal morphology among these populations due to the identified high frequency [3, 4, 5]. For Europeans, it is unusual morphology.

Ethnicity is a predisposing factor for anatomical abnormalities such as the number of tooth roots. The Mongoloid population shows significantly more often first mandibular molar with three roots with a 3:1 ratio when compared to Caucasians and Afro-Americans. This is the reason this variation to be discussed as genetically determined characteristic [6, 9, 13, 14].

Its size can range from short conical to very narrow root canal with large curvature. Generally, the radix entomolaris has a smaller size than the distal and mesiovestibular root. In most cases these root canals are very narrow and with a large curvature [13, 14].

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

REFERENCES:


