

Taurodont First Molar and its Treatment

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ABSTRACT

Morphological anomalies in the root and crown of the tooth are quite common. Taurodontism, one of the most important structural anomalies of the tooth, is a developmental anomaly associated with the anatomical structure of the tooth. In this study, taurodontism was found in the first and second molars of a 28-year-old female patient admitted to our clinic with pain complaints. Root canal treatment was applied on tooth number 46 and the pulp chamber was filled with MTA. The patient was followed up.

Keywords: taurodontism, developmental anomaly, structural anomaly, dental treatment

INTRODUCTION

Morphological anomalies in the root and crown of the tooth are quite common. Changes seen in the structural and dental tissues such as the number, size, shape and size of the teeth create dental anomalies. Taurodontism, one of the most important structural anomalies of the tooth, is a developmental anomaly associated with the anatomical structure of the tooth. Taurodontism is a dental anomaly characterized by vertical expansion of the pulp chambers, apical displacement of the pulp base and no narrowing at the enamel-cement junction level. Bifurcation or trifurcation is seen in the roots [1]. This anomaly was first described by Gorganovic-Kranber in 1908. It was described in 1913 by Sir Arthur Keith. Keith named these teeth taurodontism, which consists of tauros, which means bull in Greek, and odontos, which means teeth, as it resembles the teeth of four-legged ruminant animals [2]. A large number of taurodont teeth have been found in anthropological studies conducted on fossils that are regarded as the ancestors of modern man. For this reason, they evaluated taurodont teeth as specific to the first human [3,4]. In a study that put the frequency of taurodontism in prehistoric and historical periods, it was reported that taurodontism is a general feature that changes with the change of chewing habits in humans [5]. Its etiology is still unknown, but various theories about taurodontic root formation have been put forward [6,7]. It is thought that Her twigs epithelial root sheath diaphragm may be due to horizontal

invagination error or growth delay in the transverse process [8,9]. This anomaly can be unilateral or bilateral, there is no gender discrimination. Although permanent teeth are more frequently affected, it is also seen in primary teeth, and the same can be seen in one or more teeth in the half jaw [2]. The classification made by Shaw in 1928 is widely used today. Shaw classified taurodontism according to the degree of displacement of the pulp base towards the apical. Accordingly, taurodontism; It is grouped under three headings as hypo-, meso- and hyper-taurodontism, and the pyramid form of the root canal is also included [10]. Taurodontism may cause some difficulties in endodontic, orthodontic and / or prosthetic treatment planning. It may cause difficulties in instrumentation and canal filling during endodontic treatment. The shifting of the furcation to the apical triad may complicate the extraction of the taurodont tooth [11].

CASE REPORT

A 28-year-old female patient was referred as a dental anomaly case from her private practice to Ankara University Faculty of Dentistry Endodontics clinic with complaints of pain in her teeth. Panoramic and periapical x-rays are taken from the patient and examined. As a result of the evaluation, taurodontism was found in all first molars. The patient's complaint area has been evaluated with priority. In clinical evaluation, amalgam restoration in the first molar tooth and caries in the distoocclusal tooth were found in the lower right region.

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Percussion, palpation and mobility was not encountered. No pathology was found in soft tissues. Dentine caries was found in tooth

number 46 on periapical X-ray and no pathology was observed in the periapical tissue (Figure 1).

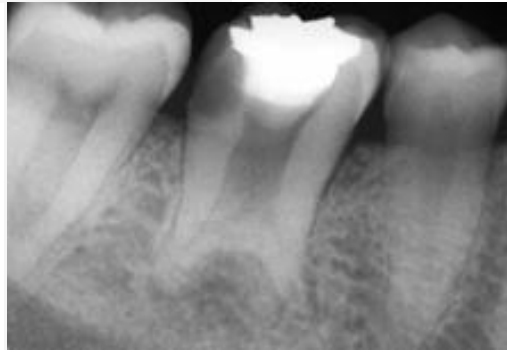


Figure1. Radiograph at diagnosis

Root canal treatment was indicated for the tooth with a diagnosis of irreversible pulpitis in the tooth whose clinical, radiological and patient history were listened, and treatment was started.

The first session with the patient to mandibular anesthesia (Ultraca D-SA, Aventis Pharma, Istanbul, Turkey), although we started as a result

of hearing the patient's pain, in addition buccal infiltration anesthesia with deep intraligamentous- and intrapulpal anesthesia is provided. The old restoration was removed from the mouth, after opening the access cavity, a rubber-dam was applied. There are 4 channels, 2 in the mesial and 2 in the distal (Figure 2).



Figure2. Access cavity and rubber-dam application

Pulp chamber was extirpated with the help of excavator and canal turner (Figure 3).



Figure3. Pulp extirpation

Pulp stone was removed from the pulp chamber. Then, K-type files were placed in the canals and the root canal length film was taken. The mesiobuccal tubercle was accepted as the reference and the mesial canals were measured

as 18 mm, and the distal canals as 17 mm. Again, the distance from the reference point to the canal mouths was measured as 14 mm (Figure 4).

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Figure 4. *Determination of working length*

After the root canal lengths were determined, the channels were expanded up to S1, S2, F1 and F2 with the Pro Taper (Universal, Dentsply Maillefer, Switzerland) file system. 2 ml of

2.5% NaOCl was used for irrigation at each file change. The last wash was done with saline solution and the root canals were filled with angled F2 gutta (Figure 5).



Figure 5. *Filling of root canals*

Cotton pellets were placed on the gutta as cut from the canal mouths and the tooth was temporarily covered with glass ionomer cement. In the second session of the patient, the pulp

chamber of 14 mm was filled with MTA Angelus and the coronal part of the tooth was restored with composite filling material (Figure 6).



Figure 6. *Filling the remaining pulp chamber with MTA after root canal filling*

DISCUSSION

Taurodontism appears to have a normal structure in human fossils belonging to the past in studies conducted in the 1908s. Therefore, the anatomical appearance in question is not an anomaly in human ancestors. It is a structural

change that occurred during the evolutionary process [2]. Differences in the prevalence of taurodontism are considered to be social differences. It is more common in Eskimos, Israel, American Indians, a region of Spain and the Caucasus, suggesting that this anomaly is

related to genetic and environmental factors [4,9,11]. This anomaly can be seen alone or together with many anomalies. Taurodont teeth can be seen together in chromosomal somatic disorders such as amelogenesis imperfecta, dentino genesis imperfecta, hypodontics, genetic disorders with systemic effects or Down syndrome [12-14]. This anomaly is mostly seen in molar teeth. It can be seen unilaterally as well as bilaterally, and more than one tooth may be affected as in this case. In taurodont molar teeth, besides the width of the pulp chamber, there are also differences from the normal canal anatomy, and in this case, the treatment of these teeth becomes difficult.

Taurodontism can only be detected clinically by radiography. However, it has been suggested that measurement points may vary radiologically, and may be misleading due to insufficient root formation, root resorption and root tip displacement [4,15].

In this study, it is thought that dentists who have anatomical knowledge and clinical experience can detect anatomical variations radiographically, as in this case. The diagnosis and treatment of teeth with anatomical variations requires clinical training and experience. In this case, the pulp chamber was filled with MTA after the root canal filling was completed. In various studies, it is reported that MTA induces hard tissue formation. At the same time, MTA is defined as a material that can interact closely with osteoblast cells [16,17]. In many studies, it has been observed that the covering of MTA is quite superior compared to the compared materials [18-21]. In addition to its covering, expansion during erection is important in terms of preventing inter-tubular coronal leakage [20,22,23]. It is also antimicrobial and can be directly restored with composite without the need for a base material [24]. Considering its biological properties, it was applied to the tooth showing anatomical variation and the patient was followed.

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Citation: Bilge Ozcan & Bade Sonat, "Taurodont First Molar and its Treatment", *International Journal of Research Studies in Medical and Health Sciences*. 2021; 6(2): 9-13. DOI: <https://doi.org/10.22259/ijrsmhs.0602002>

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