Endodontic Mananagement of A Mandibular Taurodont Molar Using Thermoplasticised ObturationTechnique : A Case Report

Dr. Radhika Malik
P.G. Student
Dr. Sumita Giri Nishad
Professor & H.O.D.
Dr. Mohit sharma
Reader
Dr. Deepti Bindal
Reader
Dr Deepak Tomar
Sr. Lecturer
Dr. Anurag Sarin
Sr. Lecturer

Department of Conservative Dentistry
& Endodontics
Shri Bankey Bihari Dental College
Ghaziabad UP

Abstract- Taurodontism can be described as a change in tooth shape caused by the failure of the Hertwig's epithelial sheath diaphragm to invaginate at the proper horizontal level. The characteristic features are an enlarged pulp chamber, apical displacement of the pulpal floor, and no constriction at the level of the cementoenamel junction. The most commonly affected teeth are the permanent molars. Here, we report a case in which endodontic treatment of the mandibular left second molar with taurodontism was performed using the thermoplasticised obturation technique.

Keywords- Taurodontism, pulp chamber, endodontic treatment, mandibular molar

Introduction

Taurodontism is a morpho-anatomical change in the shape of the tooth in which the body of the tooth is enlarged and the roots are reduced in size. It is recognized as a clinical entity for almost a century and has been found in the dentition of modern races. It is characterized by enlargement of the pulp chamber, which may approximate of the root apex, with the body of the tooth enlarged at the expense of the roots and apically displaced furcation areas (1). The bifurcation or trifurcation may be only a few millimeters above the apices of the roots. Taurodontism was identified in the teeth of Neanderthal specimens and, for a time, was thought to be absent in modern populations (2,3). Although the condition was first described by Gorjanovic-Kramberger in 1908, the term taurodontism was proposed by Sir Arthur Keith in 1913 to describe the "bull-like" condition of the teeth (4) Taurodontism was a frequent finding in early humans and is most common today in Eskimos, possibly as a selective adaptation for cutting hide (5). This trait can be seen in permanent and primary teeth, in a single tooth, or in several molars in the same quadrant, and can be unilateral or bilateral. (2,6) It is caused by failure of the Hertwig's epithelial sheath diaphragm to invaginate at the proper horizontal level. It has also been suggested that taurodontism is genetically transmitted and that it is associated with various syndromes. (7-12)

The condition is classified as hypo-, meso-, or hypertaurodontism, based on the degree of apical displacement of the pulp chamber floor (3). Hypotaurodontism is the least pronounced form, in which the pulp chamber is enlarged; mesotaurodontism is the moderate form, in which the tooth roots are divided only at the middle third; and hypertaurodontism is the most severe form, in which bifurcation or trifurcation occurs near the root apices (3). Review of the literature reveals a wide discrepancy in the prevalence of taurodontism in different populations. Its prevalence has been reported to range between 5.67% and 60% of subjects (13,14). In a recent study, it has been accounted for 18% of all of the anomalies (15). The prevalence of taurodontism in children was found in 0.3% (16).

Case Report

A 26 year old male patient was referred to the Department of Conservative dentistry and Endodontics with a chief complaint of mild intermittent pain in left lower back tooth region. The patient's medical history was non-contributory. On oral examination and periapical radiography, a carious lesion was found on the left mandibular second molar, with endodontic involvement. (Fig. 1)

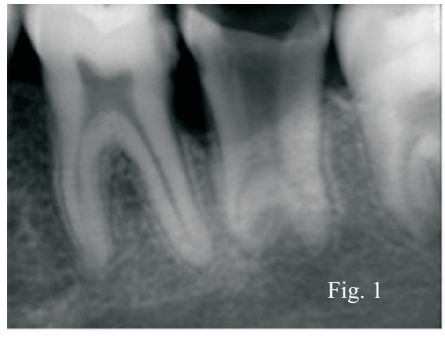
Fig. 1

A vitality test of the tooth was negative, and a diagnosis of pulp necrosis was made. A periapical radiograph revealed hypertaurodontism.

After administration of local anaesthesia (2% lidocaine) and placement of a rubber dam (Dental Hygienic) the access cavity preparation was done (Fig. 2).

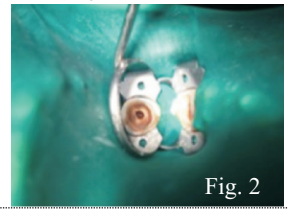
Fig. 2

A huge pulp chamber was found, but the root furcation was difficult to identify.

At the furcation area, mesiobuccal , mesiolingual and distal canal orifices were observed. Pulp extirpation was performed, and the canal was thoroughly debrided by irrigation with 5 ml of 2.5% sodium hypochlorite solution. The mesiolingual and mesiobuccal orifices were located very close to each other (Fig. 3).

Fig. 3

The root canal was prepared by using crown-down technique with Universal ProTaper 0.06 instruments (Dentsply-Maillefer, Switzerland) up to size F3 in the distal canal and size F2 in the mesial canals. Both the mesial canals merged into a single canal while their biomechanical

preparation. A final irrigation with 17% EDTA was performed. A dressing of calcium hydroxide was given for 1 week and the patient was recalled for obturation thereafter.

In the next visit, master cone selection was followed by thermoplasticised root canal obturation (E&Q obturation system; Meta) with AH Plus cement (Dentsply-Maillefer) irt #37 (Fig. 4, 5 and 6).

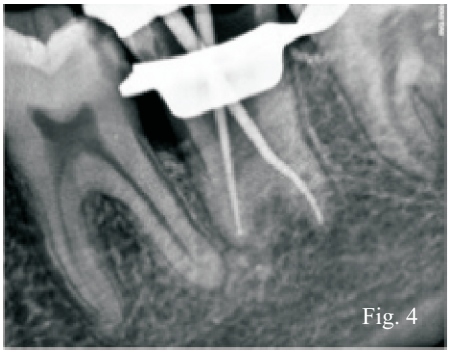

Fig. 4

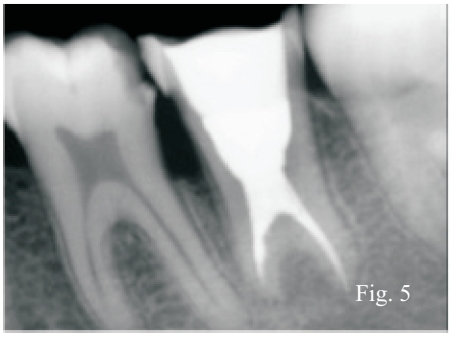

Fig. 5

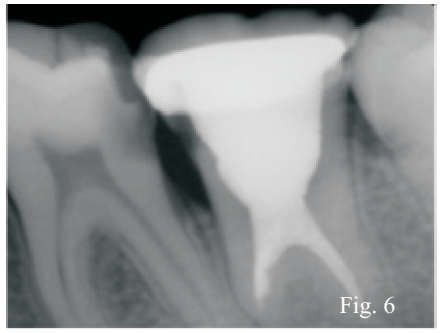

Fig. 6

Discussion

Taurodontism occurs in 2.5% to 3.5% of chromosomally normal Caucasians. Usually, it is an isolated anomaly, but can occur in several well-known syndromes, due to alterations of the sex chromosomes. These syndromes include Klinefelter syndrome (17) and trisomy 21, or Down syndrome (10). Taurodontism is more strongly associated with syndromes involving an ectodermic defect (18). Identification of patients with multiple taurodontic teeth could lead to early recognition of a systemic disorder and improve quality of life.

A taurodont tooth shows wide variation in the size and shape of the pulp chamber, varying degrees of obliteration and canal configuration, apically positioned canal orifices, and the potential for additional root canal systems (19).

From an Endodontist's view, taurodontism presents a challenge during negotiation, instrumentation and obturation in root canal therapy. Because of the complexity of the root canal anatomy and proximity of buccal orifices, complete filling of the root canal system in taurodont teeth is challenging. A modified filling technique, which consists of combined lateral compaction in the apical region with vertical compaction of the elongated pulp chamber, has been proposed (4). The number of root canals in taurodontic teeth varies. Mandibular molars with 5 canals and maxillary molars with 4 or 5 canals have been reported (4,8).

Because the pulp of a taurodont is usually voluminous, in order to ensure complete removal of the necrotic pulp, 2.5% sodium hypochlorite has been suggested initially as an irrigant to digest pulp tissue. Application of final ultrasonic irrigation may ensure that no pulp tissue remains (20).

High-quality diagnostic radiographs are very important during the endodontic treatment of such teeth. CBCT is a relatively new diagnostic imaging modality that has been used in endodontics for effective evaluation of root canal morphology. (21) It has been important in locating and identifying root canals, mainly when anatomic variations and difficulties are found (22, 23).

Thus it can be concluded that in performing root canal treatment on these teeth, one should appreciate the complexity of the root canal system. Careful exploration of the grooves between all orifices, particularly with magnification; ultrasonic irrigation; and a modified filling technique are recommended.

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