Case Report

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Taurodont: A Case Series

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ABSTRACT

Background: Taurodontism is a rare embryologic anomaly of teeth, defined by an apical displacement of the furcation of roots and enlarged pulp chambers. Taurodontism has been classified as hypo-, meso- or hypertaurodontism according to the severity of the anomaly. The aim of this case report was to illustrate clinical cases of teeth with taurodontism. Three different cases of irreversible pulpitis in taurodont have been successfully treated.

Keywords: Dentistry, Multiple teeth, taurodontism.

INTRODUCTION

The term taurdontism comes from the Latin term **tauros,** which means 'bull' and the Greek term **odus,** which means 'tooth' or 'bull tooth'; however, the term taurodontism was first introduced by Sir Arthur Keith in 1913.Taurodontism can be defined as a change in tooth shape caused by the failure of Hertwig's epithelial sheath diaphragm to invaginate at the proper horizontal level[1]. This abnormality is a developmental disturbance of a tooth that lacks constriction at the level of the cemento-enamel junction (CEJ) and is characterized by vertically elongated pulp chambers, apical displacement of the pulpal floor, and bifurcation or trifurcation of the roots[2]. Although permanent molar teeth are most commonly affected, this change can also be seen in both the permanent and deciduous dentition, unilaterally or bilaterally, and in any combination of teeth or quadrants. Whilst it appears most frequently as an isolated anomaly, its association with several syndromes and abnormalities has also been reported[3].

CASE REPORT

CASE 1

A twenty-nine-year-old female patient reported to department of Conservative dentistry and Endodontics, with chief complain of spontaneous pain and food lodgement in upper left back region of jaw for 2 months. The patient's medical history was non–contributory. Intraoral examination revealed a normal shaped crown with deep occlusal carious lesion. The tooth was sensitive to percussion. The periodontal probing was within normal range (2-3mm). The preoperative periapical radiograph suggested the following possibilities, a deep occlusal carious lesion with endodontic involvement; elongated pulp chamber extending up to the trifurcation with no periapical changes. Based on the clinical and radiographic findings, a diagnosis of hypertaurodontism with symptomatic irreversible pulpitis was given to mandibular left first molar. Mandibular left second molar (37) was anesthetized with inferior alveolar block using 2%lignocaine with epinephrine 1:100000 and pulp chamber of 37

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was accessed under rubber dam isolation. Working length were determined with # 10 K files in mesial canals and # 15 K file in distal canal by ingles method and confirmed with electronic apex locator and radiovisiography [Figure 1]. Biomechanical preparation of pulp chamber was achieved by circumferential filing with ISO K files of size # 25 in all canals followed by further shaping using ProTaper files (F1 for mesial canals and distal canals) [Figure 1]. Canals were irrigated with 2.5% sodium hypochlorite using Endoactivator sonic irrigation, 17% aqueous solution of EDTA and 2%W/V chlorhexidine gluconate and saline as the final irrigant using 26-G needles. After thorough drying of canals with paper points, In next visit good apical stops were obtained using the ProTaper master cones. So that they were obturated with warm vertical compaction technique using heated plugger as a heat carrier, It was decided to back fill the pulp chamber with thermo-plasticized gutta percha. Post endodontic restoration was done by packable and flowable composite resin material.

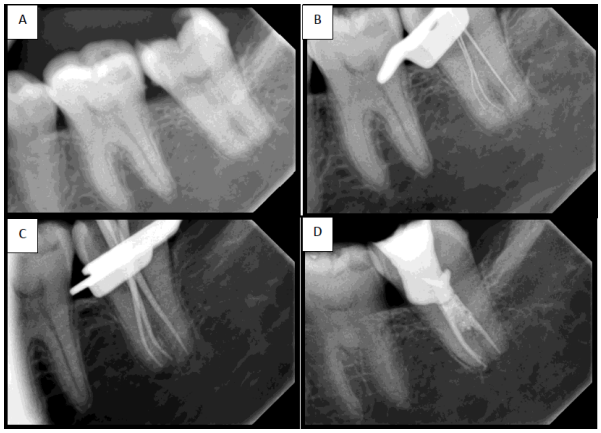

Fig 1: Preoperative radiographs of the Hypertaurodontic mandibular left second molar (a), with the endodontic files at the working length of mesiobuccal, mesiolingual and distal root canals (b) with the master cones at the working length of mesiobuccal, mesiolingual and distal root canals (c), post-operative radiograph (d)

CASE 2

A sixteen year old female patient reported to department of Conservative dentistry and Endodontics, with chief complain of pain in upper left back region of jaw. The patient's medical history was non–contributory. Intraoral examination revealed a normal shaped crown with deep occlusal carious lesion. The tooth was sensitive to percussion. The periodontal probing was within normal range (2-3mm). The preoperative periapical radiograph suggested the following possibilities (Fig 2): a deep occlusal carious lesion with endodontic involvement; elongated pulp chamber extending up to the furcation with no periapical changes. Based on the clinical and radiographic findings, a diagnosis of mesotaurodontism with symptomatic irreversible pulpitis was given to maxillary left first molar. Maxillary left first molar (26) was anesthetized with inferior alveolar block using 2%lignocaine with epinephrine 1:100000 and pulp chamber of26 was accessed under rubber dam isolation. Working length were determined with # 15 K files in mesial canals and # 20 K file in distal canal by ingles method and confirmed with electronic apex locator and radiovisiography [Figure 2]. Biomechanical preparation of pulp chamber was achieved by circumferential filing with ISO K files of size # 25 in all canals followed by further shaping using ProTaper files (F2 for palatal canal and F1 for mesial canals) [Figure 2]. Canals were irrigated with 2.5% sodium hypochlorite using Endoactivator sonic irrigation, 17% aqueous solution of EDTA and 2%W/V chlorhexidine gluconate and saline as the final irrigant using 26-G needles. After thorough drying of canals with paper points, In next visit tooth was asymptomatic and canals were dry. Obturation of the canals were done using GP cones and Endoflass sealer with conventional lateral compaction technique. Post endodontic restoration was done by composite filling material.

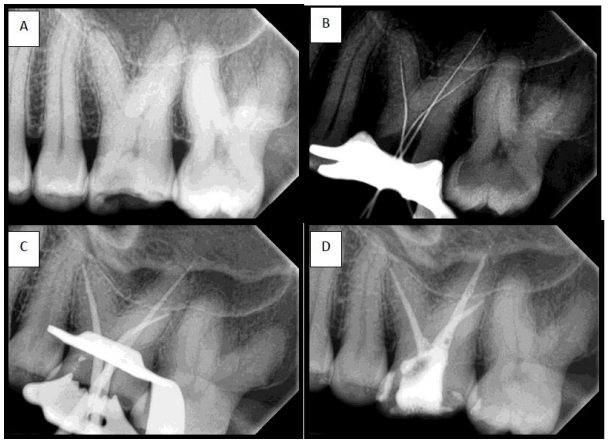

Fig 2: Preoperative radiographs of the mesotaurodontic maxillary left first molar (a), with the endodontic files at the working length of

mesiobuccal, distobuccal and Palatal root canals (b) with the master cones at the working length of mesiobuccal, distobuccal and Palatal root canals (c), post-operative radiograph (d)

CASE 3

A 20-year-old male patient was referred to the Department of Conservative Dentistry and Endodontics for the endodontic treatment of her lower left second molar tooth (tooth #37). The patient complained of pain on food lodgement. This molar had no pain in response to cold test (Pulpofluorane spray, Septodont, France) and was sensitive to percussion. No past medical history was present. Intraoral examination revealed a normal shaped crown with proximal carious lesion. The periodontal probing was within normal range (2-3mm).

The preoperative periapical radiograph suggested proximal carious lesion with endodontic involvement; elongated pulp chamber extending up to the furcation with no periapical changes. Based on the clinical and radiographic findings, a diagnosis of hypertaurodontism with symptomatic irreversible pulpitis without apical periodontitis was given to mandibular left second molar. Biomechanical preparation and obturation were done same as case 1. Post endodontic restoration was done by Miracle Mix(GC Corp, Tokyo, Japan) restorative material.

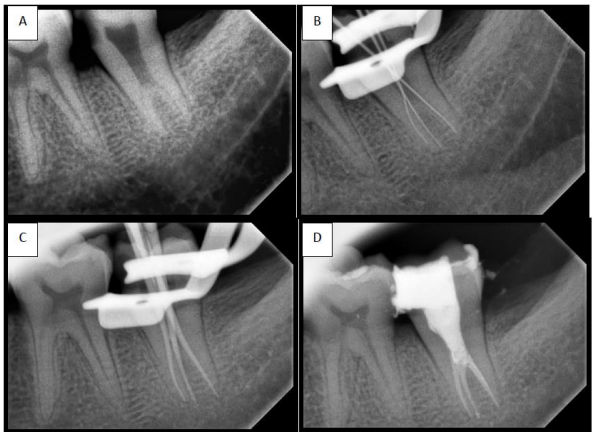

Fig 3: Preoperative radiographs of the Hypertaurodontic mandibular left second molar (a), with the endodontic files at the working length of mesiobuccal, mesiolingual and distal root canals (b) with the master cones at the working length of mesiobuccal, mesiolingual and distal root canals (c), post-operative radiograph (d)

DISCUSSION

The term taurodontism was originated by Sir Arthur keith in 1913 to describe a peculiar dental anomaly in which the body of the tooth is enlarged at the expense of the roots. The term means 'bull like' teeth and its usage is derived from the similarity of these teeth to those of ungulate or cud chewing animals. Taurodont teeth further classified into hypotaurodont, mesotaurodont, and hypertaurodont forms, with hypertaurodontism being extreme form in which the bifurcation occurs near the apices of the roots and hypotaurodontism being the mildest form[4].

Taurodontism can affect both deciduous and permenant dentition. The teeth can involved most commonly molars, can be single or multiple teeth, can be bilateral or unilateral. The teeth do not show any remarkable changes in morphologic clinical characteristics. Radiographicaly, the teeth are rectangular in shape , pulp chambers are exteremaly large with short roots. The bifurcation or trifurcations are few millimeters above the apices of root[5].

Medical history records were checked to find if there was an association with anomalies or syndromes or systemic illness. which have several oral and systemic manifestations:Down syndrome, Klinefelter syndrome (XXY), Smith-Magenis syndrome, Lowe syndrome (oculo-cerebro-renal syndrome), Tricho-dento-osseous syndrome (TDO), Williams syndrome,McCune-Albright syndrome, Wolf-Hirschhorn syndrome, Mohr syndrome (oral-facial-digital II syndrome),Van der Woude's syndrome. Developmental anomalies-Tooth agenesis, Hypodontia/oligodontia., Amelogenesis imperfecta (hypoplastic–hypomaturation with taurodontism), Pulpal calcification, Cleft lip or palate, Triad of microdontia–taurodontia–densinvaginatus[6]. In this article, however, the patients were healthy with no known diseases. This condition is, then, considered to be an anatomic difference that can occur in the normal population.

Durr *et al*, proposed that the morphology can affect the position of the orifices, making it more challenging to shape and fill the root canals[7].

Increased hemorrhage observed during access preparation can be mistaken for perforation. However, since the roots are short and the pulpal floor is placed apically, it is important to be careful to avoid perforation. PUI(passive ultrasonic irrigation) is more efficient in cleaning canals than ultrasonic irrigation with simultaneous ultrasonic instrumentation[8,9].

This article presents the successful conclusion of root canal treatment for a taurodont with endoactivator technique. This sonically driven system has been engineered to safely activate various intracanal agents and vigorously produce the hydrodynamic phenomenon. The EndoActivator system is able to remove the smear layer, debride into the uninstrumentable portions of the root canal system like bifurcations or trifurcations[10].

Because of the complexity of the root canal anatomy and the proximity of the buccal orifices, complete filling of the root canal system in taurodontism is challenging[11]. Tsesis *et al.*, suggested that a combination of the lateral compaction technique and the warm vertical compaction technique can be used to obturate a taurodont tooth. But in present case report good apical stops were obtained using the ProTaper master cones, it was decided to back fill the pulp chamber with thermo-plasticized gutta percha. Clinical and radiographic follow-up will be required[12].

CONCLUSION

Treating Taurodont can be an endodontic challenge. Thus it is very essential to carefully modify the treatment plan along with the use of modern adjuncts for a successful outcome of Endodontic treatment.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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