



ORIGINAL RESEARCH PAPER

Dental Science

‘ENDODONTIC MANAGEMENT OF MESO-TAURODONTISM – A CASE REPORT’

KEY WORDS: Taurodontism, endodontic management, developmental anomaly, mesotaurodontism.

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ABSTRACT

Taurodontism is a rare anomaly which involves teeth with larger than usual pulp chambers due to apical displacement of the floor of the pulp chamber. The degree of apical displacement of the chamber varies from case to case and forms the basis for the working classification of the condition. Although taurodontism is not associated with any functional or pathological impedece to the individual, the clinician should be aware of its known associations with certain genetic/chromosomal disorders. Endodontic procedures involving taurodontic teeth are fraught with difficulties owing to the increased apico-occlusal length of the pulp chamber and shortened length of the root canals. This leads to challenges in extirpation of the pulp, location of orifices, biomechanical preparation and obturation. In this case report I report a case of an individual with carious pulpal involvement of a taurodontic tooth which was managed with endodontic therapy.

INTRODUCTION

Taurodontism has been defined as “teeth with large pulp chambers in which the bifurcation or trifurcation are displaced apically, so that the chamber has greater apico-occlusal height than in normal teeth and lacks the constriction at the level of cemento-enamel junction (CEJ). The distance from the trifurcation or bifurcation of the root to the CEJ is greater than the occluso-cervical distance.”[1]

The most frequently affected teeth are the molars [9]and the incidence is reported to be lower than 1% in modern man (Joseph, 2008), 3% in primitives, Eskimos and American Indians (Tsesis,2003) [2].

Taurodontism occurring concomitantly with amelogenesis imperfecta has been reported by Crawford. In addition, it has also been reported that many patients with Klinefelter syndrome exhibit taurodontism. [3]

Endodontic management of Taurodontism is a challenging proposition to the Clinician as it offers significant degree of difficulty in gaining access to the pulp chambers, locating root canal orifices, bio mechanical preparation as well as obturation.

Case Report

24 year old serving soldier reported to the dental centre with a chief complaint of pain in lower right back tooth since past 15 days. Pain was continuous in nature, dull throbbing in character, radiating to side of the jaw, pain was sleep disturbing, relived by over the counter medication and applying pressure on the tooth. There was no history of trauma to the tooth. The tooth had been restored 2 months previously. Medical history was non contributory. Extra oral examination did not reveal any swelling in the Maxillo Facial region. On intraoral examination, Mandibular right second molar was found to be restored by a temporary restoration and was sensitive to percussion.

Radiographic examination in the form of an Intra Oral Peri Apical radiograph was carried out which revealed caries extending below the temporary restoration involving the pulp without any significant periapical changes (Fig 1).



Fig 1 – Initial presentation of the involved tooth

In addition the pulp chamber was enlarged apico-occlusally with apically displaced furcation leading to shortened roots. A diagnosis of symptomatic apical periodontitis with meso taurodontism was made using Shiffman and Chanannel criteria (Fig 4).

The tooth was anaesthetized, the access opening was done and the pulp tissue within the chamber was extirpated using #45 barbed broach (Densply) and file braiding technique. 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 [4]. Moreover, as adequate instrumentation of the irregular root canal system cannot be anticipated, Widerman & Serene suggested that additional efforts should be made by irrigating the canals with 2.5% sodium hypochlorite in order to dissolve as much necrotic material as possible [5]. Copious irrigation was done with 2.5% sodium hypochlorite (Dentpro) to ensure complete removal of pulp tissue within the voluminous pulp chamber. A working length radiograph was taken (Fig 2) with #15 files (Dentsply) in the canals. After determination of working length, the distal canal was instrumented upto #30 file and mesiobuccal and mesiolingual canals instrumented upto #25 file.



Fig 2 – Establishment of Working length

Calcium hydroxide (Dentpro) closed dressing was placed inbetween appointments. Final irrigation was performed with 0.2% chlorhexidine. After drying the canals were obturated with GuttaPercha points using lateral compaction technique utilising endomethasone (septodont) sealer. After that the elongated pulp chamber was filled with vertical compaction using Glass ionomer restorative material (Fuji Type II). The final radiograph confirmed a well condensed filling of the canals (Fig 3).

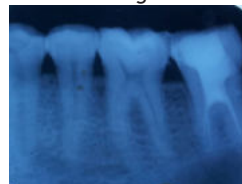


Fig 3 – Radiograph upon completion of root canal filling

DISCUSSION

Taurodontism is a dental anomaly characterized by large pulp

chambers and short roots. Roots often bifurcate or trifurcate at a lower level. The term "Taurodontism" was first used by Sir Arthur Keith in 1913 to describe the teeth of prehistoric people, the Neanderthals and Heidelberg. He coined this term from the Latin Word tauro (for bull) and Greek term dont (for tooth). [6]

The etiology of taurodontism is unclear. The possible causes of taurodontism have been enumerated by Mangion [7] as follows: 1) A specialized or retrograde character, 2) A primitive pattern, 3) A Mendelian recessive trait, 4) An atavistic feature, and 5) A mutation resulting from odontoblastic deficiency during dentinogenesis of the roots. Although the exact mode of genetic transmission is not understood, the hereditary tendency of taurodontism is well established [8]. According to Hamner et al., taurodontism is caused by the failure of Hertwig's epithelial sheath diaphragm to invaginate at the proper horizontal level [9]

Clinically, a taurodont appears as a normal tooth. The diagnosis of taurodontism is usually a subjective determination made from diagnostic radiographs [10]. The radiographic characteristics of taurodont tooth are: extension of the rectangular pulp chamber into the elongated body of the tooth, shortened roots and root canals, location of furcation (near the root apices), despite a normal crown size [11]

Shaw (1928) classified taurodont teeth according to their severity into hypo-, meso- and hypertaurodont forms, hypotaurodontism being the least pronounced form, mesotaurodontism the moderate form and hypertaurodontism being the most severe form in which the bifurcation or trifurcation occurs near the root apices [12]. Later in 1978 Shiffman and Chanannel [13] established mathematical criteria which are adopted by various authors for assessing their cases. According to this criteria, a tooth is considered as a taurodont if the distance from the lowest point of roof of the pulp chamber (A) to the highest point of the floor (B), divided by the distance from A to the root apex (C) is equal to or greater than 0.2 mm, and when the distance from B to the CEJ (D) is greater than 2.5 mm. (Fig 4)

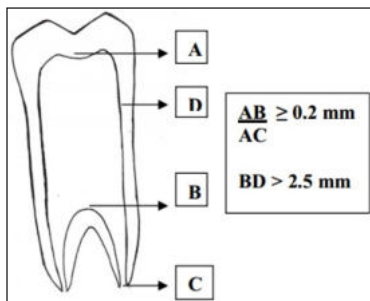


Fig 4 – Shiffman and Chanannel criteria of classification of Taurodontism

Only little information is available about the clinical significance of taurodontism [8]. According to Widerman and Serene unusual shape of the root canals in taurodents may cause difficulty in endodontic treatment [5]. Our case presented a challenge during negotiation, instrumentation and obturation. Krasner and Rankow proposed the Law of Centrality: The floor of the pulp chamber is always located in the center of the tooth at the level of the CEJ [14], however in our case the floor of the pulp chamber was about 4 mm below the level of CEJ leading to significant difficulty in location of the canal orifices. Another factor which compounded the difficulty was the close proximity of mesiolingual and mesiobuccal orifices. Moreover, as the canals were very short, they were instrumented with only the apical third of the file which was time consuming. As the canal orifices were deeply placed in the tooth, the obturation procedure was also difficult.

In order to combat the abovementioned difficulties it is impertinent that the access opening provide straight line access to the floor of the pulp chamber which will aid in location of orifices and biomechanical preparation (Fig 5)

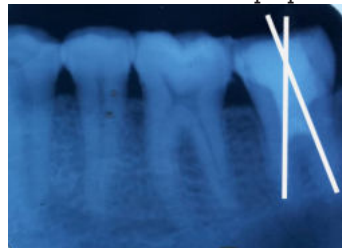


Fig 5 – Lines indicating extension of walls of the pulp chamber to gain straight-line access

DISCUSSION

Although taurodontism is of rare occurrence and does not require any treatment, the clinician should be aware of the challenge it faces to endodontic therapy and one should appreciate the complexity of the root canal system.

Conflict of interest

None identified

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