

ENDODONTIC TREATMENT IN PRIMARY MOLARS WITH TAURODONTISM – A CASE REPORT

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ABSTRACT

Dental morphological traits are of particular importance in the study of phylogenetic relationships and population affinities. One of the most important abnormalities in tooth morphology is Taurodontism. 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. An enlarged pulp chamber, apical displacement of the pulpal floor, and no constriction at the level of the cemento-enamel junction are the characteristic features. Although permanent molar teeth are most commonly affected, this change is very rarely seen in primary dentition. Taurodontism has a very low incidence in primary dentition and very few cases have been reported in the literature. Endodontic treatment of a taurodont tooth is challenging, because it requires special care in handling and identifying the canal obliteration and configuration and the potential for additional root canal systems. This paper highlights a case report of taurodontism in primary molars of a five year old male child with endodontic treatment.

KEY WORDS: Primary Molars, Taurodontism, Pulpectomy.

INTRODUCTION

Unusually shaped teeth having a cylindrical or prismatic form were described in remnants of prehistoric hominids in 1903 by De Terra, in 1907 by Gorjanovic Kramberger and Adloff, and in modern man in 1909 by Pickerill, who used the term "radicular dentinoma" to describe the condition. These observers noted that this tooth form was different from that usually seen in modern human dentitions, but no attempt was made by any of these authors to name these peculiar teeth.¹

Keith defined taurodontism as "a tendency for the body of the tooth to enlarge at the expense of the roots. It is a tendency to assume the condition seen in the ox." The origin of the term is from the Greek word tauros, which means "bull", and odontos, which refers to "tooth".¹ In 1913, Sir Arthur Keith coined the term "Taurodontism" to describe this unusual tooth form.²

In 1928. Shaw classified the types of taurodontism as hypotaurodontism, mesotaurodontism, and hypertaurodontism and included a pyramidal form of root canal as well. These classifications were based on the relative amount of apical displacement of the pulp chamber floor.^{1, 3, 4, 5}

Taurodontism may be unilateral or bilateral and affects permanent teeth more frequently than primary teeth. The prevalence rate of taurodontism in the general population is low and is reported to vary with ethnicity. It is commonly observed among the Eskimos and Natives of Australia and Central America.² The prevalence of taurodontism reported in modern-day populations have varied from 0.54% in the primary dentitions of Japanese children to as high as 5.6% in the permanent dentitions of Israeli adults.⁶

Theories concerning the pathogenesis of taurodontic tooth formation include, an unusual developmental pattern, a delay in the calcification of the pulp chamber floor, an odontoblastic deficiency, an alteration in Hertwig's epithelial root sheath, with an apparent failure of the epithelial diaphragm to invaginate at the normal horizontal level and "a delayed or incomplete union of the horizontal flaps of the epithelial diaphragm".^{1,7,8}

Taurodontism appears most frequently as an isolated anomaly, but it has also been found to occur along with several well known syndromes due to alterations of sex chromosomes, such as Klinefelter's syndrome, Trisomy 21 or Down's syndrome, Wolf-Hirschorn syndrome and Trichodonto-osseous syndrome.^{4,5}

Following is a case report of taurodontism involving four primary molars.

CASE REPORT

A five year old male child came to Department of Pedodontics, Raja Muthiah Dental College and Hospital, with a chief complaint of painful decayed teeth in the upper and lower jaw. He complained of recurrent, spontaneous pain in multiple primary molars for a period of 15 days.

His medical history was not contributory. General examination and intra oral soft tissue examination revealed no adverse defect. Intra oral hard tissue examination revealed the presence of following teeth.

55 54 53 52 51 61 62 63 64 65
85 84 83 82 81 71 72 73 74 75

On clinical examination there was deep caries in relation to lower left first and second primary molars, lower right first primary molar and upper left second primary molar. Intra oral periapical radiographs of these teeth revealed caries involving the pulp and also an abnormality in tooth anatomy (Figure.1, 2 and 3 respectively).

The radiographic findings were

- Unusually long pulp chamber which had no constriction at the cemento-enamel junction.
- No distinct roots were found but large canal openings, ending at the apex were observed.

From these radiographic findings, the tooth was diagnosed to be a taurodont. The teeth were subjected for clinical tests and a diagnosis of chronic irreversible pulpitis was made in relation to lower left first and second primary molars, lower right first primary molar and upper left second primary molar. Multi-visit pulpectomy procedures were performed followed by semi permanent restorations with stainless steel crowns.

DISCUSSION

Taurodontism is a condition in which the tooth trunk is elongated and the floor of the pulp chamber is displaced apically with proportionately shortened roots. The term is meant to reflect the close similarity between human teeth and those of ungulates, particularly bulls.

Widdowson defined taurodontism as the vertical deepening of the pulp cavity at the expense of the roots. Aitchison described taurodontism as human molars with large pulp chambers extending to the roots. Moorress described them as pulp chamber of greater height extending rootwise beyond the level of the cemento enamel junction and lacking a noticeable constriction at this level. Feichtinger and Rossival considered that to define taurodontism the distance from the furcation to the amelocementum joint should be greater than cervico occlusal distance.⁹

In 1978, Shifman and Chanannel proposed the following criteria for determining the presence or absence of taurodontism: Taurodontism was present if the distance from the lowest point at the Occlusal end of the pulp chamber (A) to the highest point at the apical end of the chamber (B) divided by the distance from A to the apex was 0.2 or greater and if the distance for B to the cemento-enamel junction (CEJ) was greater than 2.5mm.^{3,9}

Based on Shifman and Chanannel criteria, we found that all the molars were taurodents. Lower left second primary molar had an index value of 0.4, lower left first primary molar had an index value of 0.5, lower right first primary molar had an index value of 0.37 and upper left second primary molar had an index value of 0.2.

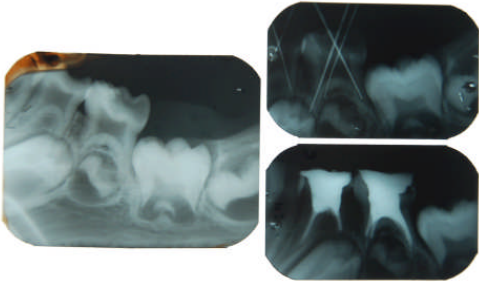


Fig.1 - IOPA radiographs showing taurodontism of lower left first and second primary molars, pre and post pulpectomy.

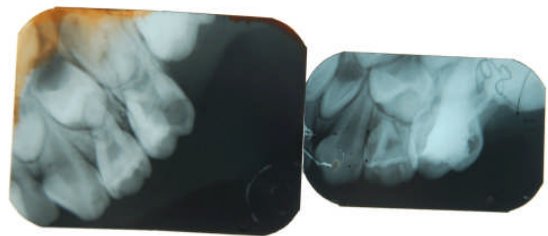


Fig.3 - IOPA radiographs showing taurodontism of upper left second primary molar, pre and post pulpectomy

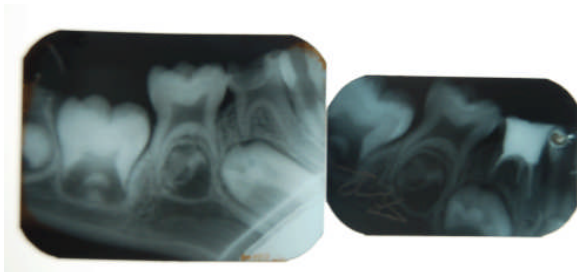


Fig.2- IOPA radiographs showing taurodontism of lower right first primary molar, pre and post pulpectomy.

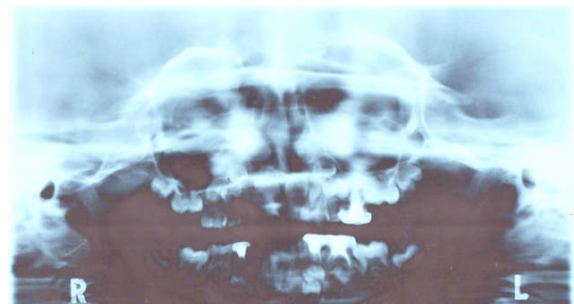


Figure.4- Orthopantomograph showing post treatment taurodonts.

Taurodontism is an anomaly of multi-rooted teeth, sometimes bilateral and multiple, characterized by enlargement of the apical portion of the pulp chamber. In this patient the four primary molars exhibited taurodontism. It can occur as an isolated case or as a component of specific syndromes. In this patient, there were no systemic diseases or syndromes. Most reports reveal that permanent teeth are more frequently affected than primary teeth. Permanent molars and premolars could not be evaluated with OPG (figure 4) as they were in their developmental stage. Mandibular molars are found to be affected more often than maxillary molars. We found taurodontism affecting both the maxillary and mandibular molars with more number of involved teeth in the mandible.

Access opening was done with round bur. Precurved K-file was used for canal exploration. The working lengths were determined by radiographic interpretation with K files. Bio mechanical preparation was done with copious irrigation. Obturation was done with zinc oxide eugenol paste. Stainless steel crowns were placed following endodontic treatment.

Pulp therapy for taurodonts is a challenging task. As taurodont shows wide variation in the size and shape of the pulp chamber with varying degrees of obliteration and canal configuration, more care should be taken during root canal therapy. Increased hemorrhage during access opening may be mistaken for perforation. Since the roots are short and pulpal floor is placed apically, care should be taken to prevent perforation.

More emphasis should be given on its occurrence in both dentitions of the same patient, its occurrence in families, and its association with other abnormalities. Importance should be given for careful diagnosis and treatment modalities.

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