**Case Report**

# A Rare Condition of Bimaxillary Primary Molar Taurodontism

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**ABSTRACT**

Taurodontism is a relatively rare variance with a very low incidence in primary dentition and only a few cases have been reported in the literature. It stands a challenge when these teeth require pulp therapy. This case report illustrates the oral rehabilitation of multiple primary molars with taurodontism involving both the maxillary and mandibular arches, which is a rare occurrence.

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## Introduction

Dental anomalies are the abnormalities of human dental structures that result from disturbances during tooth formation. Local, systemic as well as familial inheritance may be responsible for these developmental disturbances. Most of these influences are genetically mediated and hence, primary and permanent teeth are affected. [1] One such anomaly in tooth morphology is taurodontism. This is a developmental disturbance of tooth that lacks constriction at the level of the cementoenamel junction (CEJ), characterized by vertically elongated pulp chambers, apical displacement of the pulpal floor and furcation of the roots. [2]

The term taurodontism comes from the Latin word tauros, which means 'bull' and the Greek term odus, which means 'tooth' or 'bull tooth'. Gorjanovic‐Kramberger first described this type of anomaly in 1908; however, the term taurodontism was introduced by Sir Arthur Keith in 1913 to describe molar teeth resembling those of ungulates, particularly bulls. [2]

The etiology of taurodontism is unclear. It has diverse possible causes that include an unusual pattern of development, a delay in the calcification of the pulp chamber floor, an alteration in Hertwig's epithelial root sheath, along 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. [3] Certain recent reports have described an association between taurodontism, familial inheritance, and genetic malformations. It is said to be more prevalent in individuals with cleft lip and palate, syndromes such as Down's, Klinefelter's, Apert's, Mohr's and Tricho dento‐osseous (TDO). [2, 4-5] However, contemporarily it is considered as an anatomic variant that could occur in otherwise normal population.

The present case report illustrates the oral rehabilitation of a child with non syndromic - non familial taurodontism of multiple primary molars involving both the dental arches; which is a rare occurrence.

## Case Report

A 3-year-old south Indian girl was reported to the department of pediatric dentistry with a complaint of pain in lower right and left back tooth region since 1 week. Pain was spontaneous, intermittent, non-radiating, aggravated during night and subsided on medication. The medical history revealed that child was born to non-consanguineous parents with non-contributory health history.

Intraoral examination showed complete set of primary dentition with mesial step molar relation and

carious lesions of varying severity in relation to left maxillary first and all four mandibular primary molars.(Figure 1) An intraoral periapical radiograph of the symptomatic teeth revealed caries involving the pulp in relation to left mandibular second as well as right mandibular first and second molars with an abnormality in tooth anatomy showing abnormally extended pulp chamber with no constriction at the CEJ , large root canal ending at the apex resembling single or pyramidal root for all the molars suggestive of taurodontism. (Figure 1)

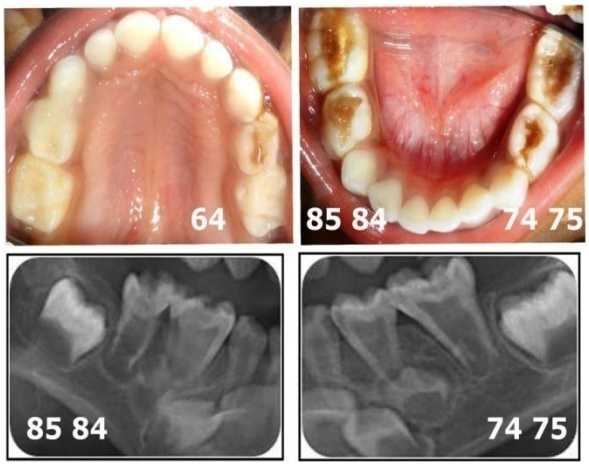


**Figure 1:** Preoperative photographs and radiographs

The panoramic radiograph revealed the involvement of maxillary primary molars with similar pulp chamber anatomy of the mandibular molars and no other obvious anomalies were noticed. (Figure 2)

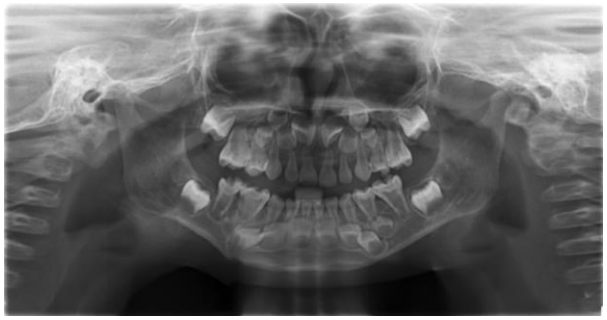

**Figure 2:** Preoperative panoramic radiograph suggesting taurodontism of all deciduous molars

From these radiographic findings, it was diagnosed to be a cuneiform type of taurodontism according to classification given by Shaw in 1928. [2] A diagnosis of dental caries was made for all the five involved teeth based on clinical and radiographic findings with chronic irreversible pulpitis in relation to mandibular left second as well as both right molars. As there was no apical constriction proceeding with conventional obturation technique posed a dilemma. Hence, three teeth were treated by multivisit pulpectomy procedure followed by placing a small piece of a synthetic collagen material at the level of the apex (CollaCote®; Zimmer Dental, Carlsbad, USA), and using hand plugger as a barrier. Final obturation was done with a combination of iodoform and calcium hydroxide (Metapex® Meta Dental New York; Elmhurst, USA) paste and a semi- permanent restoration with stainless steel crowns. As left maxillary first primary molar was having multisurface caries, it was restored with stainless steel crown and left mandibular first primary molar with composite restoration. (Figure 3)

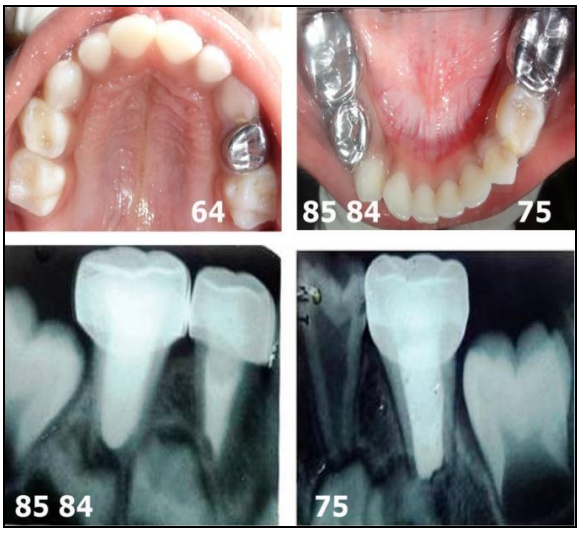


**Figure 3:** Postoperative photographs and radiographs

Suspecting a familial inheritance, panoramic radiograph was advised for the parents, which revealed no obvious anomalies.

**Discussion**

Taurodontism is a morphological variation characterized by bull‑like heavy bodied tooth in which crown tends to enlarge at the expense of root resulting in a greater apico-occlusal height when compared to the cynodont teeth. Taurodontism was first described in 1908 by Gorjanovic- Kramberger a 70000-year-old pre-Neanderthal fossil, discovered in Kaprina, Croatia. [2] Taurodontism was a frequent finding in early humans and is most common today in Eskimos, possibly

**Table 1:** Showing systemic and oral findings of syndromes associated with taurodontism.

| Syndromes | Inheritance | Oral findings | Systemic findings |
|---|---|---|---|
| Down's, | Additional 21 chromosome | Macroglossia<br>Delayed eruption<br>Absence of tooth germs | Small nose<br>Short stature<br>Mental retardation<br>Muscular hypotonia |
| Klinefelter's | Additional X chromosome | Cleft soft palate<br>Missing premolars<br>Delayed development of the permanent tooth germs | Small testes<br>Azoospermia<br>Mental retardation<br>Chromosome Aberrations |
| Apert's | Autosomal dominant | Anterior open bite<br>Dental malocclusion<br>Delayed tooth eruption<br>Crowding of the dental arch | Syndactyly<br>Proptosis of eyes<br>Mental retardation<br>Skeletal deformities |
| Mohr's | Autosomal recessive | Cleft palate<br>Small tongue<br>Notching of the upper lip | Polydactyly<br>Brachydactyly<br>Neuromuscular disturbance |
| Tricho dento-osseous | Autosomal dominant | Hypoplastic enamel | Curly hair<br>Dense bone<br>Skull sclerosis |

as a selective adaptation for cutting hide. [6] Table 1 shows systemic, oral findings of these syndromes associated with taurodontism which aid us in proper diagnosis.

Prevalence of taurodontism in different populations has been reported to range between 5.67% and 60%. However it was found to be 0.3% in children. [7] Although males are commonly more affected than females, [5, 7] it was diagnosed in a female child in the present case. Permanent dentition is frequently involved than primary, with mandible more frequently involved than maxilla. [8] Even though very low incidence has been reported in the literature regarding primary teeth, the previous reports present them as an isolated trait with either of the arches affected, more often involving primary second molars. [3, 7, 9] However in the present case, all primary molars in both dental arches are diagnosed as taurodonts; presenting this case as a unique entity.

Clinically, a taurodont appears as a normal tooth where the body and roots lie below the alveolar margin. Its distinguishing features cannot be recognized clinically; therefore, the diagnosis is usually made from radiographs. [2] The radiographs usually show exceedingly large pulp chamber with short roots. Various conditions such as pseudohypoparathyroidism, hypophosphatasia dentinogenesis imperfecta (Brandywine type), regional odontodysplasia, dentinal dysplasia type 2 and even internal resorption of teeth would also demonstrate enlarged pulp chamber like taurodonts radiographically. [9] Hence, a thorough knowledge regarding this information is necessary for the differential diagnosis.

A taurodont tooth shows broad deviation in the shape and size of pulp chamber, varying degrees of canal obliteration and configuration, apically positioned canal orifices, and potential for additional root canal systems. [2, 10] Hence, endodontic treatment is a challenging task as it involves various technical hitches like access and preparation, location of the orifices, difficulty in instrumentation and obturation. [2, 10] As the root canals are relatively larger with wide open canal apically, the conventional obturation material like zinc oxide eugenol may take longer time to resorb and interfere with the eruption of permanent teeth. Therefore, obturation was done with calcium hydroxide plus iodoform with CollaCote® as apical barrier in the present case considering their resorbable properties.

## Conclusion

Even though taurodontism is appreciated as a rare phenomenon, it is imperative for the clinician to be aware of various syndromes, metabolic diseases and the clinical considerations associated with this condition which aids in proper differential diagnosis and

management. Emphasis should be made on various preventive programs especially in pediatric age group to avoid challenges encountered during the permanent dentition period.

**Conflict of Interest**

The authors of this manuscript certify that they have no conflict of interest.

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