

MULTIPLE TAURODONTISM WITH MISSING TEETH: A RARE CASE REPORT

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ABSTRACT:

Taurodontism can be defined as a change in tooth shape caused by the failure of Hertwig's epithelial root sheath diaphragm to invaginate at the proper horizontal level. Taurodontism is a rare dental anomaly affecting primarily the molars. It is usually found in association with other anomalies or as a part of a syndrome, in which the involved tooth has an enlarged, an elongated body and a pulp chamber with apical displacement of the pulpal floor. This anomaly which is considered as a feature of primitive man has also been reported in modern man but at low prevalence rate. In this article we report a rare case of a 23 year old male patient who presented with multiple teeth affected by taurodontism, and also showed multiple missing permanent teeth.

Key words: Taurodontism, Hertwig's epithelial root sheath (HERS), bull teeth.

الملخص العربي:

عدد من أسنان الثور و عدد من الاسنان المفقودة: تقرير لحالة نادرة

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يمكن تعريف أسنان الثور على أنه تغيير في شكل الأسنان التي تنجم عن فشل الحجاب الحاجز لغمد الجذر الظهارية لهيرتويغ في التغليف على المستوى الأفقي الصحيح للجذر. أسنان الثور هوشنوذ نادرة الأسنان تؤثر في المقام الأول على الأضراس وعادة ما تكون موجودة مع غيرها من الحالات الشاذة أو كجزء من متلازمة. التي تشمل توسع وامتداد غرفة اللب مع التشرذم القمي من سقف اللب. وتقيد التقارير أيضا بان الوضع الشاذ الذي يعتبر سمة من سمات الإنسان البدائي والإنسان الحديث ولكن بمعدل انتشار أقل. في هذا المقال يتم الإبلاغ عن حالة نادرة لمريض عمره 23 سنة يشكو من عدد من أسنان الثور، مع عدم وجود عدد من الأسنان الدائمة. الكلمات المفتاحية: أسنان الثور، غمد الجذر الظهارية لهيرتويغ

INTRODUCTION:

Dental anomalies are formative defects caused by genetic disturbances during Tooth morphogenesis¹. The term 'taurodontism' was how ever first stated by Sir Arthur Keith in 1913. The origin of this term is from Greek "tauros" which means "Bull" and "odontos" which means "Tooth"². Taurodontism was first described in 1908 by Gorjanovic and Kramberger³. 70,000 year old pre-neanderthal fossil, discovered in Kaprina, Croatia⁴ Witkop

defined Taurodontism 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 that seen in normal teeth and lacks the constriction at the level of cemento-enamel junction (CEJ). The distance from the bifurcation or trifurcation of the root to the CEJ is greater than the occluso-cervical distance"⁵. Taurodont teeth are classified According to their severity into three forms; Hypo, meso and hyper taurodont⁶.

Hypotaurodontism being the least pronounced form, mesotaurodontism is the moderate form and hypertaurodontism being the most severe form in which the bifurcation or trifurcation occurs near the root apices⁶. The illustration of the various forms are shown in, Fig 1.

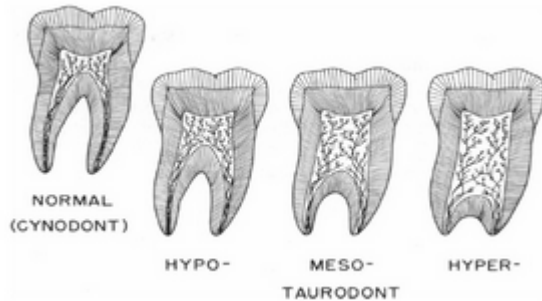


Figure 1. Diagrammatic representation of normal (cynodontic) tooth and three subclasses of taurodont teeth as proposed by Shaw. [Courtesy of Jaspers and Witkop⁸].

This subjective, arbitrary classification led to normal teeth to be misinterpreted or diagnosed as taurodont teeth. Though there are more than one classification systems to describe the severity of the condition, Shifman and Chananel⁷ in 1978 proposed a practical classification and is the widely used system till now.

CASE REPORT

A 23-year-old male patient was reported to the department of Oral and Maxillofacial surgery of Govt. Dental College and Hospital Nagpur (MH), India with a complaint of multiple mobile teeth. Oral examination revealed over retained 52, 53, 55, 63, 75, 85 and missing 12, 13, 15, 22, 23, 32, 35, 45 teeth. The dentition was in normal size and appearance with some plaque, calculus, with some brownish black stains deposition. The clinical examination did not reveal any periodontal pockets around all teeth, Fig 2. A and 2B. To explore the multiple missing permanent teeth, Orthopantomogram (OPG) were taken. The OPG revealed resorbed roots with 52, 53, 55, 63, 75, 85 teeth and missing 12, 13, 15, 22, 23, 32, 35, 45 teeth. Teeth 36, 38 and 46 showed short, conical, mis-shapen roots with enlarged pulp chambers, which are classified by crown root ratio as meso-taurodontism and teeth 37, 47 as hyper-taurodontism. The Mathematical criteria put forward by Shiffman and Chananel⁷ was also applied to confirm the Presence of taurodontism. The patient was tested for Serum



Figure 2 A. Clinical Intra oral photograph of patient (Maxillary teeth).



Figure 2 B. Clinical Intra oral photograph of (Mandibular teeth).



Figure 2 C. The Orthopantomogram of the patient showing resorbed roots with 52, 53, 55, 63, 75, 85 teeth and missing 12, 13, 15, 22, 23, 32, 35, 45 teeth. Teeth 36, 38 and 46 with meso-taurodontism and teeth 37, 47 with hypertaurodontism.

Level of the alkaline phosphatase to rule out hypophosphatemia, which is reported to be associated with the presence taurodont teeth if the patient affected by hypophosphatemia during dentinogenesis of the roots⁹.

DISCUSSION

The exact etiology of taurodontism is unclear. The possible theories explaining the etiology of anomaly have been described by Mangion as follows: A specialized or retrograde character, a primitive pattern, a Mendelian recessive trait, an atavistic feature, a mutation resulting from odontoblastic deficiency during development of the roots⁹. According to Hamner and coworkers, the taurodontism is caused by the failure of the sheath diaphragm to invaginate at the proper horizontal level of the tooth¹⁰. Interference in the Epithelio - mesenchymal induction has also been proposed as a possible etiology¹¹. Today, it is only considered as an anatomic variant that could occur in a normal population¹². Taurodontism Occurs in 2.5% to 3.5% of chromosomally normal Caucasians. Taurodontism appears most frequently as an isolated anomaly, but it has also been described in association with several developmental syndromes and genetic anomalies including amelogenesis imperfecta, Down's Syndrome, ectodermal dysplasia, McCune-Albright syndrome, Van der Woude syndrome, Smith-Magenis syndrome, Williams syndrome, Hypophosphatasia, Klinefelter syndrome, trichodento-osseous syndrome, Mohr syndrome, Wolf-Hirschhorn syndrome, Lowe syndrome and Focal Dermal-Hypoplasia or Goltz-Gorlin Syndrome¹³. Review of available literature reveals a wide variation in the prevalence of the reported taurodontism in different populations. In a recent study, it has been accounted for 18% of all of the anomalies¹⁴. The prevalence of condition in children was found in 0.3%¹⁵. Another study on a group of Jordanian dental patients has shown an overall prevalence of 8%¹⁶. Ruprecht et al¹⁷ found a prevalence of 11.3% for individuals in Saudi dental patients. Because of the complexity of the root canal anatomy and proximity of buccal pulp orifices taurodontism presents a challenge during endodontic instrumentation, negotiation, and obturation in root canal therapy. A modified filling technique, which consists of combined lateral compaction in the apical region with vertical compaction of the elongated pulp chamber, has been proposed¹⁸.

Because of its large body, little surface area of a taurodont tooth is embedded in the alveolus. This feature would make the extraction of such teeth less difficult as long as the roots are not usually widely divergent¹⁹. Because of less surface peri-cemental area embedded in the alveolus, the taurodont teeth may not have as much anchorage as a cynodont, when used as an abutment for prosthetic or orthodontic anchorage purposes²⁰. Multiple taurodontism, probably indicates the presence of an unknown genetic factor as in this case. However, the patient did not present with genetic signs may indicate alterations in sex chromosomes. In our patient, however, the exact final diagnosis was not possible because the patient's parents declined genetic testing.

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