

# Taurodontism a challenge in endodontics: A case report

T. Vigneshwar Sambandam, Sindhu Ramesh

Departments of Conservative Dentistry and Endodontics, Saveetha Dental College, Saveetha University, Chennai, Tamil Nadu, India

**Correspondence:** Sindhu Ramesh, Department of Conservative Dentistry and Endodontics, Saveetha Dental College, Saveetha University, 162, Poonamallee High Road, Chennai, Tamil Nadu – 600077, India. Phone: +91-9840136543. E-mail: drsinramesh@gmail.com

## ABSTRACT

Taurodontism has been a clinical entity for many long years. In case the tooth and pulp chamber is enlarged, the dental anomaly (taurodontism) is found in the molar tooth of humans. As a result, the length of the root is decreased, leading the floor of the pulp and the furcation of the tooth moving apically down the root. The mentioned condition occurs because of the failure or late invagination of Hertwig’s epithelial root sheath, which helps in the formation of root and shaping causing an apical shift of the root furcation. The most commonly affected teeth are the permanent molars, and this developmental disturbance can also be seen in deciduous dentition. It happens either unilaterally or bilaterally, along with any teeth or quadrants’ combination. It usually appears as a single anomaly, it may also appear along with several syndromes as well as with developmental abnormalities. Through, there have been challenges in endodontic therapy, taurodontism has only been paid little attention from clinicians. With regard to performing root canal treatment on such teeth, the complexity of the root canal system, canal obliteration and configuration, and the potential for additional root canal systems should be appreciated. The most useful techniques are as follow: careful exploration of the grooves between all orifices particularly with magnification, use of ultrasonic irrigation, and a modified filling technique. More to the point, a case is presented in the present study in which root canal therapy is performed on left mandibular first molar with taurodontism.

**Keywords:** Taurodontism, dental anomaly, enlarged pulp chamber, endodontic treatment

## Introduction

Taurodontism has been a clinical entity for many long years. Taurodontism had be one of the most important abnormalities in tooth morphology. The term “taurodontism” (“bull tooth”) was coined from the Latin term “tauros”, which means “bull” and the Greek term “odus”, which means ‘tooth’.<sup>[1]</sup>

Taurodontism is a developmental disturbance found in the molar tooth of humans where the body of the tooth and pulp chamber is enlarged and as a result the length of the root is decreased. Therefore, the floor of the pulp and the furcation of the tooth is moved apically toward the root. This condition is due to the failure or late invagination of Hertwig’s epithelial root sheath, which helps in the formation of root and shaping causing an apical shift of the root furcation.<sup>[2]</sup>

Taurodontism was first described in 1908 by Gorjanovic-Kramberger<sup>[3]</sup> in a 70,000 years old prenatal fossil found in Kaprina, Croatia.<sup>[4]</sup> Keith was first to introduce the term taurodontism to describe molar teeth which were resembling ungulates (bulls).<sup>[5]</sup> According to severity of the condition Shaw classified taurodont teeth into hypotaurodontism, mesotaurodontism, and hypertaurodontism forms, among which the least pronounced form was hypotaurodontism, mesotaurodontism the moderate form and the most severe form in which the bifurcation or trifurcation occurs near the root apices was hypertaurodontism.<sup>[6]</sup>

The etiology of taurodontism is not clear. Mansion described the possible causes of taurodontism as specialized or retrograde character, primitive pattern, Mendelian recessive trait, an atavistic feature, and mutation resulting from odontoblastic deficiency during dentinogenesis of the roots.<sup>[7]</sup>

According to Hamner *et al.*, taurodontism is due to failure of Hertwig’s epithelial sheath diaphragm to invaginate at the proper horizontal level.<sup>[8]</sup> Mostly, it appears as an isolated anomaly, and in addition to it, Klinefelter syndrome and downs syndrome are most commonly associated with this condition too, but it is not a constant feature of this syndrome.<sup>[9]</sup> Nowadays, it is considered to be an anatomic variant that can occur in a normal population.<sup>[10]</sup> The prevalence of taurodontism range from 2.5% to 11.3% of the

### Access this article online

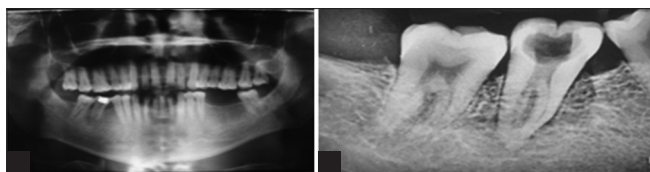
Website: [www.japer.in](http://www.japer.in)

E-ISSN: 2249-3379

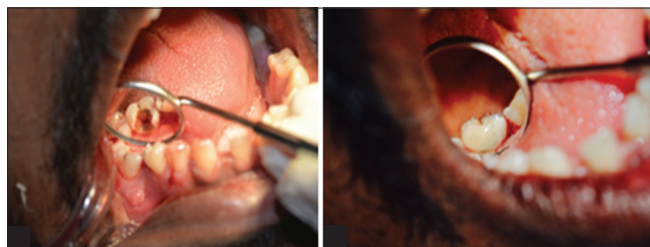
**How to cite this article:** Sambandam TV, Ramesh S. Taurodontism a challenge in endodontics: A case report. J Adv Pharm Edu Res 2017;7(3):349-351.

**Source of Support:** Nil, **Conflict of Interest:** None declared.

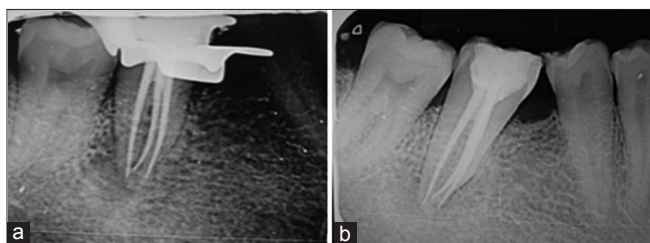
This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.



**Figure 1:** (a) Orthopantomograph, (b) pre-operative intraoral periapical



**Figure 2:** (a) Intraoral view, (b) lingual wall build



**Figure 3:** (a) Master cone, (b) obturation

human population. This paper describes a case reports of conventional endodontic treatment carried out in a hypotaurodontic tooth.

## Case Report

A 32-year-old male patient came to the postgraduate clinic of the Department of Endodontics, Saveetha Dental College and Hospitals, Chennai, for the treatment of mandibular right lower first molar with chief complain of fractured tooth in the right lower back tooth region for past 1 month. The patient did not complain of any pain and do not have any medical history. At the time of examination, the tooth was already initiated with root canal therapy (access opening) (Figure 1) by a general dentist because of irreversible pulpitis. The lingual wall fractured and it was extending subgingivally and the tooth was not sensitive to percussion (Figure 2). Radiographic examination of the affected tooth revealed an abnormal tooth anatomy with the pulp chamber extending beyond the cervical area reaching the furcation and two roots were seen at the furcation area in the apical third. From the radiographic findings, the tooth was diagnosed to be a hypotaurodontism (Figure 3).

## Management of mandibular right first molar

As the lingual wall was absent, under local anesthesia, the flap was elevated followed by composite build-up with appropriate isolation. Suturing was done and after a week time working length determine using an electronic apex locator which was followed by cleaning and shaping using hand K-files initially and later with M2 (step back technique) along with 3% sodium hypochlorite and ethylenediaminetetraacetic acid as irrigant. Obturation was done using

0.6% taper single cone. A permanent entrance filling was given with composite resin on the same day. The complete procedure was done under dental operating microscope (Carl Zeiss). Crown preparation was done and impression made for full veneer metal ceramic. A temporary crown was given. Later, followed by permanent crown cementation. 1-month follow-up radiograph revealed the tooth to be functional and asymptomatic. Patients were recalled for a 6-month follow up.

## Discussion

Taurodontism is a rare anomaly and a wide variations seen is in of the pulp chamber with varying degrees of obliteration and canal configuration, apically positioned canal orifices are seen in case of a taurodont tooth and in such case it becomes a great challenge to the dentist during negotiation, instrumentation, and obturation in root canal therapy.<sup>[11]</sup> The most frequently affected teeth are the molars. The distance between the baseline connecting the two CEJ and the highest point in the floor of the pulp chamber is used in determining taurodont teeth. Taurodontism is diagnosed in molars when this distance exceeds 2.5 mm.<sup>[12]</sup>

Taurodontism is associated with developmental syndromes like amelogenesis imperfecta, down's syndrome, ectodermal disturbance, Klinefelter syndrome, trichodontoosseous syndrome, Mohr syndrome, Wolf-Hirschhorn syndrome, and Lowe syndrome.<sup>[11]</sup> A complete filling of the root canal system in taurodont teeth is challenging because of the proximity of buccal orifices and complexity of the root canal anatomy. A combined lateral compaction in the apical region with vertical compaction of the elongated pulp chamber has been proposed for the treatment of taurodont tooth. Therefore, there should be proper exploration of grooves between the orifices with the help of microscope, proper irrigation, and of the root canals and the complexity of root canal is high in case of taurodontism and a modified filing technique as lateral compaction with warm vertical condensation is recommended.<sup>[13]</sup>

## Conclusion

Taurodontism shows a wide range of variations in the size and also shape of pulp chambers with varying degrees of obliteration and canal complexity, low canal orifices, and with high chances of an extra root canal. From an endodontist's point of view, it possesses a great challenge during the negotiation of the root canal, instrumentation, and obturation during root canal therapy. Therefore, one must be familiar with taurodontism and its complexity of root canal system, its clinical significance, complication, and important endodontic consideration during management of such tooth.

## References

1. Keith A. Problems relating to the teeth of the earlier forms of prehistoric man. *Proc R Soc Med* 1913;6:103-24.
2. Yang J, Wang SK, Choi M, Reid BM, Hu Y, Lee YL, *et al*. Taurodontism, variations in tooth number, and misshapened crowns in Wnt10a null mice and human kindreds. *Mol Genet Genomic Med* 2015;3:40-58.

3. Gorjanovic-Kramberger K. Über prismatische molarwurzeln rezenten und diluvialer menschen. *Anat Anz* 1908;32:401-13.
4. Prakash R, Vishnu C, Suma B, Velmurugan N, Kandaswamy D. Endodontic management of taurodontic teeth. *Indian J Dent Res* 2005;16:177-81.
5. Witkop CJ. Clinical aspects of dental anomalies. *Int Dent J* 1976;26:378-90.
6. Shaw JC. Taurodont teeth in South African races. *J Anat* 1928;62:476-98.
7. Mangion JJ. Two cases of taurodontism in modern human jaws. *Br Dent J* 1962;113:309-12.
8. Hamner JE 3<sup>rd</sup>, Witkop CJ Jr, Metro PS. Taurodontism; Report of a case. *Oral Surg Oral Med Oral Pathol* 1964;18:409-18.
9. Regezi JA, Scuibba JJ. *Oral Pathology: Clinical Pathologic Correlations*. St. Louis: WB Saunders Company; 1999. p. 45.
10. Shifman A, Chanannel I. Prevalence of taurodontism found in radiographic dental examination of 1,200 young adult Israeli patients. *Community Dent Oral Epidemiol* 1978;6:200-3.
11. Tsesis I, Shifman A, Kaufman AY. Taurodontism: An endodontic challenge. Report of a case. *J Endod* 2003;29:353-5.
12. Joseph M. Endodontic treatment in three taurodontic teeth associated with 48, XXXY klinefelter syndrome: A review and case report. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2008;105:670-7.
13. Bharti R, Chandra A, Tikku AP, Wadhvani KK. "Taurodontism" an endodontic challenge: A case report. *J Oral Sci* 2009;51:471-4.