

“Management of taurodont right mandibular second molar tooth”: A case report

Nagesh Satyappa Chowdappa, Mithra Nidarsh Hegde, Shishir Shetty¹, Ganesh Tulsidas Bhat¹

Department of Conservative Dentistry and Endodontics, Mahe Institute of Dental Sciences and Hospital, Mahe, Kerala, ¹Conservative Dentistry and Endodontics, Attavar Balakrishna Shetty Memorial Institute of Dental Sciences, Mangalore, Karnataka, India

ABSTRACT

Taurodontism is a rare dental anomaly in which the involved tooth has an enlarged and elongated body and pulp chamber with apical displacement of the pulpal floor. Endodontic treatment of a taurodont tooth is challenge to a clinician and requires special handling because of the proximity and apical displacement of the roots. In this case report, a 60-year-old male patient was referred for root canal treatment of his right mandibular second molar and on clinical examination, there was deep caries in the right mandibular second molar. Intraoral peri-apical radiographic examination of this tooth revealed a long crown containing large pulp chamber and two short roots with an apically located furcation, indicating hypertaurodontism. Endodontic treatment was completed with a combination of thermoplasticized gutta-percha technique and lateral condensation technique to achieve a successful obturation.

Key words: Taurodontism, root canal treatment, thermoplasticized gutta-percha technique

INTRODUCTION

Developmental variations of teeth can be classified based on number, size, shape and structure. Taurodontism is defined as a change in tooth shape caused by the failure of Hertwig’s epithelial sheath diaphragm to invaginate at the proper horizontal level.^[1]

The term “taurodontism” (‘bull tooth’) was derived from the Latin word “tauros”, which means ‘bull’ and the Greek word “odus”, which means ‘tooth’. Sir Arthur Keith (1913) coined the term “taurodontism”.^[2] Taurodont tooth lacks


constriction at the level of the cement-enamel junction (CEJ) and is characterized by vertically elongated pulp chambers, apical displacement of the pulpal floor, and bifurcation or trifurcation of the roots.^[3]

Shaw (1928) classified taurodontism as hypotaurodontism, mesotaurodontism and hypertaurodontism based on the relative displacement of the floor of the pulp chamber.^[4] In 1978, Shifman and Chanannel suggested a most widely accepted and used criteria. It was based on the distance from the lowest point of the roof of the pulp chamber (a) to the highest point of pulp floor (b), when divided by the distance from (a) to root apex (c) should be equal to or greater than 0.2 mm and/or distance from (b) to cement-enamel junction (d) should be greater than 2.5 mm.^[5]

Taurodontism was seen in both dentitions; however, deciduous teeth were more frequently affected than the permanent teeth. Mandibular molars were more commonly affected teeth. Taurodontism can only be observed and diagnosed radiographically.^[6,7] Taurodontism usually occurs as a isolated anomaly, but it has also been associated with several developmental syndromes and anomalies like Amelogenesis imperfecta, Down’s syndrome, ectodermal dysplasia, Klinefelter syndrome, Tricho-dento-osseous syndrome, Mohr syndrome, Wolf-Hirschhorn syndrome and

Address for correspondence:

Dr. Nagesh. S.C.,
Department of Conservative Dentistry and Endodontics, Mahe
Institute of Dental Sciences and Hospital, Mahe, Kerala, India.
E-mail: nageshendodontist@gmail.com

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Lowe syndrome.^[8] According to Yeh and Hsu, performing endodontic treatment in taurodontic teeth is very difficult.^[9]

CASE REPORT AND RESULTS

A 60-year-old male patient came to the Department of Conservative Dentistry and Endodontics, A. B. Shetty Memorial Institute of Dental Sciences, Deralakatte, Mangalore, with the chief complaint of spontaneous pain in right mandibular molar region. The patient had no history of systemic diseases. Clinical examinations revealed deep coronal caries in the second right molar. Vitality tests were performed, and he was diagnosed with irreversible pulpitis. Intraoral peri-apical radiograph showed a large pulp chamber with an elongated body of tooth, shortened roots and furcation located apically [Figure 1A].

Inferior alveolar nerve block injection of Lidocaine with 1:100,000 epinephrine was given. The tooth was isolated with rubber dam. Access cavity preparation was done. The pulp chamber was large, and the floor of the pulp was not seen. Hence, an endodontic microscope (Carl Zeiss, OPMI[®]pico) was used for locating canal orifices. The three canals, mesiobuccal, mesiolingual and distal canals, were located in the furcation area of pulpal floor [Figure 1B].

Working length was determined with K-files [Figure 1C] and confirmed with an electronic apex locator (Propex II, Dentsply Maillefer, CH-1338 Ballaigues, Switzerland). Biomechanical preparation was done. Then canals were irrigated with 2.5% sodium hypochlorite (NaOCl). Once the canal preparation was done, canals were dried with paper points and modified filling technique was used for obturation. The master apical cones of ISO color-coded 2% (Dentsply Maillefer, CH-1338 Ballaigues, Switzerland) were placed in the distal and mesiobuccal canals, but mesiolingual canal and the remaining coronal portions of canals and the pulp chamber were filled with thermoplasticized gutta-percha. Lateral compaction was also done along with above mentioned technique to achieve tight root canal seal. Then finally access cavity was restored with amalgam [Figure 1D].

DISCUSSION

Mandibular second molar teeth have shown more variations in canal configuration compared to other molars.^[10] Taurodontism is an anomaly in tooth shape characterized by elongated pulp chamber and shortened tooth roots^[11] and this anomaly is not rare and occurs within 0.25-11.3% of the population.^[5,12] Taurodontism may or may not be associated with syndromes like Down, Klinefelter's, Apert's, Oral-facial-digital (Mohr syndrome) and Tricho-dento-osseous syndrome.^[13] It has also shown high prevalence with labial/palatal clefts.^[14] However, this anomaly is also common in healthy populations.

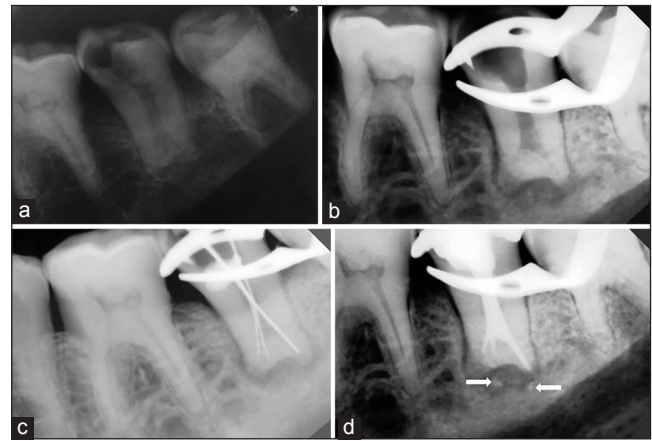


Figure 1: (A) Intraoral peri-apical radiograph showing deep coronal caries, (B) Preoperative radiograph after caries excavation, (C) Working length determination, (D) Final image after root canal obturation and white arrows indicates extrusion of gutta-flow

Shaw introduced a classification of taurodontism.^[4] The present case has been classified under hypertaurodont with three orifices and three separate root canals. In this case, all three canals were prepared and filled with recommended modified obturation technique.^[15] As there was difficulty in localization and preparation of the canals, dental microscope was used for magnification.

Wideman and Serene have recommended 2.5% sodium hypochlorite for dissolving the remaining pulp tissues.^[16] In the present case, as the root canal system was irregular and complex sufficient instrumentation may be impossible; therefore, sodium hypochlorite was used to improve canal cleaning. We used the recommended modified obturation technique; *i. e.* lateral compaction apically except mesiolingual canal and thermoplasticized gutta-percha coronally.^[15]

CONCLUSION

Root canal treatment of taurodont teeth is a complex procedure because it consumes time and is a challenge to many endodontists. Careful evaluation for additional canals because of abnormal root canal system and modified obturation technique are needed for successful treatment outcome of taurodont teeth.

SUMMARY

A case report of taurodont right mandibular second molar tooth, which was endodontically treated with a combination of thermoplasticized gutta-percha technique and lateral condensation technique to achieve a successful obturation.

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