

Pulpotomy Treatment of Taurodontic Teeth

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ABSTRACT

Background: Taurodontia is a dental anomaly that undergoes vertical dilation of the pulp chamber and has a short root. Teeth with taurodontia affected by caries to the pulp must be treated endodontically first before restoration. **Case Report:** a 4-year-old girl came in complaining of cavities in her lower jaw. After clinical examination, 84 teeth experienced deep dentin caries and from the results of radiographic photos, it was found that caries was almost close to the pulp horn with a large pulp chamber and short roots. The endodontic treatment carried out is pulpotomy and after that the final restoration uses a stainless steel crown. **Conclusion:** Taurodontia is a rare occurrence that requires a thorough clinical and radiographic examination to aid diagnosis and appropriate treatment planning. Pulpotomy can be an endodontic treatment option for primary teeth experiencing taurodontia based on objective and subjective considerations of the patient's condition.

Keywords: Taurodontia, pulpotomy, deciduous teeth

ABSTRAK

Latar Belakang: Taurodontia adalah anomali gigi yang mengalami pelebaran kamar pulpa secara vertikal dan memiliki akar yang pendek. Gigi dengan taurodontia yang terkena karies sampai ke pulpa harus dilakukan perawatan endodontik terlebih dahulu sebelum direstorasi. **Laporan Kasus:** seorang anak perempuan berusia 4 tahun datang dengan keluhan gigi berlubang di rahang bawahnya. Setelah dilakukan pemeriksaan klinis gigi 84 mengalami karies dentin dalam dan dari hasil foto radiografi diketahui karies hampir mendekati tanduk pulpa dengan kamar pulpa yang besar dan akarnya pendek. Perawatan endodontik yang dilakukan adalah pulpotomi dan setelah itu direstorasi akhir menggunakan *stainless steel crown*. **Kesimpulan:** Taurodontia adalah kejadian yang jarang terjadi sehingga memerlukan pemeriksaan klinis dan radiografis menyeluruh untuk membantu diagnosis dan perencanaan perawatan yang tepat. Pulpotomi dapat menjadi pilihan perawatan endodontik pada gigi sulung yang mengalami taurodontia berdasarkan pertimbangan kondisi pasien secara objektif maupun subjektif.

Kata Kunci: taurodontia, pulpotomi, gigi sulung

1. Introduction

Taurodontia is an anomaly in the shape of the teeth that most often occurs in deciduous and permanent molars. It occurs in the maxilla and mandible and is more commonly seen in molar teeth, either unilateral or bilateral. This dental anomaly is characterized by a pulp chamber that enlarges in the apical direction, a root that shortens proportionally, an enlarged pulp chamber and a furcation area that is shifted towards the apical. Bifurcation may be only a few millimeters above the apical.¹

Taurodontia is one of the anomalies of dental morphology which is a disorder of dental development that shows narrowing in cemento enamel junction (CEJ) and is characterized by a vertically elongated pulp chamber, shifting the base of the pulp to the apical. The origin of the name taurodontia is a combination of two words "tauros" meaning bull in Latin and "odus" which comes from Greek meaning tooth and the initial use of the term taurodontia was to describe molar teeth. The condition resembles a bull-like shape. The mechanism of occurrence of taurodontia is the late (or failed) invagination of the Hertwig root sheath that is usually responsible for root formation.^{1,2,3,4}

Pulpotomy is the endodontic treatment option when coronal pulp inflammation occurs due to bacterial penetration caused by caries, trauma or iatrogenic, and the radicular pulp is free of inflammation. This root canal morphology may have implications when endodontic treatment or removal is required. Clinically, teeth seem harmless, but endodontic taurodontic treatment can be a

huge challenge.^{1,5} This case report discusses pediatric patients who have taurodontsia and caries who expose the coronal part of the pulp. Management of this patient is endodontic treatment of his deciduous teeth, namely pulpotomy and final restoration in the form of *stainless steel crown*.

2. Case Report and Case Management

2.1 Case Report

A 4-year-old girl came to the Dental and Oral Hospital with her parents complaining of cavities, no mobility, no swelling and want to have her teeth treated. The patient has never been to the dentist before, has no drug or food allergies and has no systemic disease. The patient has no bad habits and history of brushing his teeth 1x a day when bathing. On intraoral examination, enamel caries was found in teeth 52,51,61,61 and 85. Dentin caries in teeth 53,65, and 74 there is also deep dentin caries in teeth 55,75 and 84. No swelling or fistel, gingiva within normal and plaque score of 1.45 in the moderate oral hygiene category. Extraoral examination was performed and no abnormalities were found in the face, jaw joint or lymph glands. Bilateral symmetrical face, straight face profile and well-built posture.

The results of panoramic radiographs performed on patients found that teeth 74 and 84 had dilation of the pulp chamber in the apical direction with very short roots. Tooth 84 is known to have a radiolucent image in the crown that reaches the roof of the pulp chamber, while tooth 74 is radiolucent in the crown only up to the dentin. The treatment that will be carried out on tooth 74 is a grade II filling or restoration and pulpotomy on tooth 84 before *stainless steel crown* restoration. Pulpotomy is performed on the consideration that caries has reached the deep dentin and almost hits the roof of the pulp chamber (Fig 1).



Figure 1. (A) Panoramic radiographic photograph of patient, (B) Clinical photo of dental 84 before treatment

2.2 Case Management

At the first visit of dental care 84, caries excavation was carried out until the clean tissue was removed. The tooth is still vital and caries has penetrated the pulp roof so that devitalization is carried out using paraformaldehyde and then a temporary filling is carried out. The second visit involves temporary filling removal and checks whether the tooth is nonvital. After being examined, the teeth are already in a nonvital condition so that open access is carried out to take the roof of the pulp chamber and coronal pulp tissue. Irrigation was carried out after open access using 2.5% NaOCl. Then repeated again when the coronal pulp tissue is removed or amputated. The pulp chamber is dried using cotton pellets and three way syringes and applied to ChKM medicament for sterilization then ends with a temporary filling on the dental cavity.

The dental examination carried out at the third visit obtained clean cavities results after temporary filling was removed. Irrigated with 2.5% NaOCl to remove debris, after which it is dried with *cotton pellets* and a *three-way syringe*. After drying and completely clean, filling the pulp chamber using *Zinc Oxide Eugenol (ZnOE)* cement and glass ionomer cement (GIC) is used before crown preparation for the final restoration of the stainless steel crown (Fig 2).

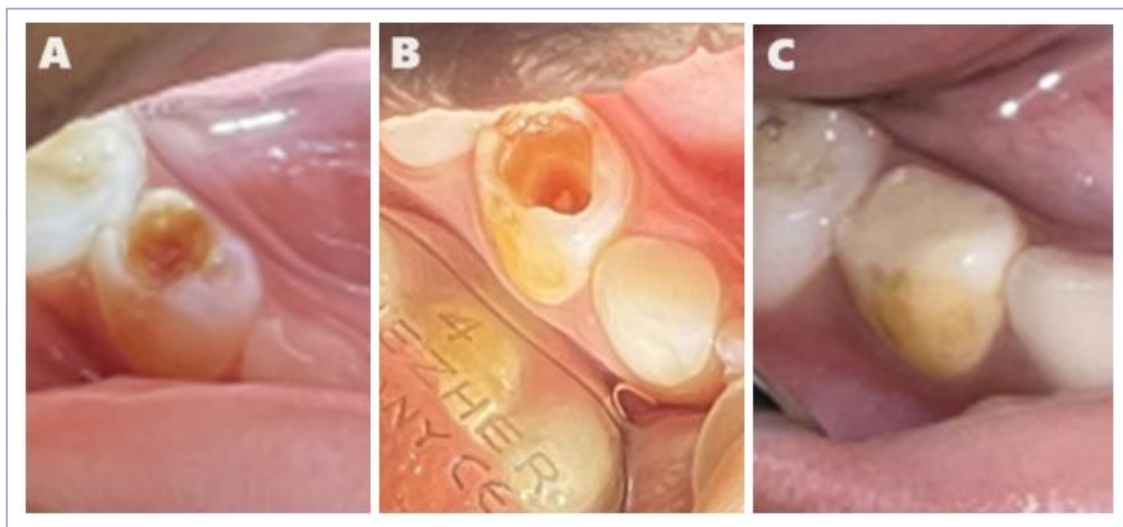


Figure 3. (A) clinical condition of teeth after caries excavation, (B) open access, (C) filling with ZnOE cement and GIC filling

The next visit was carried out control of the treatment of pulpotomy, the results of the subjective examination were obtained no complaints from the patient and objective examination there were no abnormalities in soft tissues, negative percussion and palpation tests, and no mobility in the teeth so it can be continued with crown preparation for the installation of stainless steel crowns (Fig 3).



Figure 3. Pulpotomy control, crown preparation and SSC cementation

3. Discussion

Taurodontia is a dental anomaly characterized by vertical dilation of the pulp chamber that occurs in the morphodifferentiation phase during (Fig 4). The advanced bell stage, which is a differentiation disorder that causes anomalies in tooth size and shape.^{3,6} Clinically taurodontia looks normal because its roots are located within the alveolar bone. The shape of the teeth resembles a rectangle because the narrowing of the cemento-enamel junction is less noticeable. Such conditions can be classified according to the extent of elongation of the pulp chamber. Taurodontia can appear unilaterally or bilaterally, on deciduous or permanent teeth.^{3,4}

Theories about the etiology of taurodontia diverse and are generally associated with the failure of the invagination of the epithelial root sheath to form Cynodonts. This change in the root sheath of the Hertwig epithelium involves the failure of the epithelial diaphragm to form a bridge before dentin deposition, resulting in a large pulp chamber.⁷ Pulp treatment for taurodontia is challenging, with an increased risk of bleeding during open access that can be mistaken for a perforation. Treatments should be done to prevent perforation of the root arena is short and the base of the pulp is located at the apical.^{2,8} Pulpotomy is the most widely used endodontic technique in the

treatment of deciduous dental pulp. The purpose of pulpotomy in deciduous teeth is to amputate coronal pulp adjacent to caries exposure, usually containing microorganisms and showing evidence of inflammation and degenerative changes and maintaining the vitality of the radicular pulp. The AAPD (1998) defines pulpotomy as amputation of the coronal portion of the dental pulp affected by caries and allowing the pulp to heal.^{9,10,11}

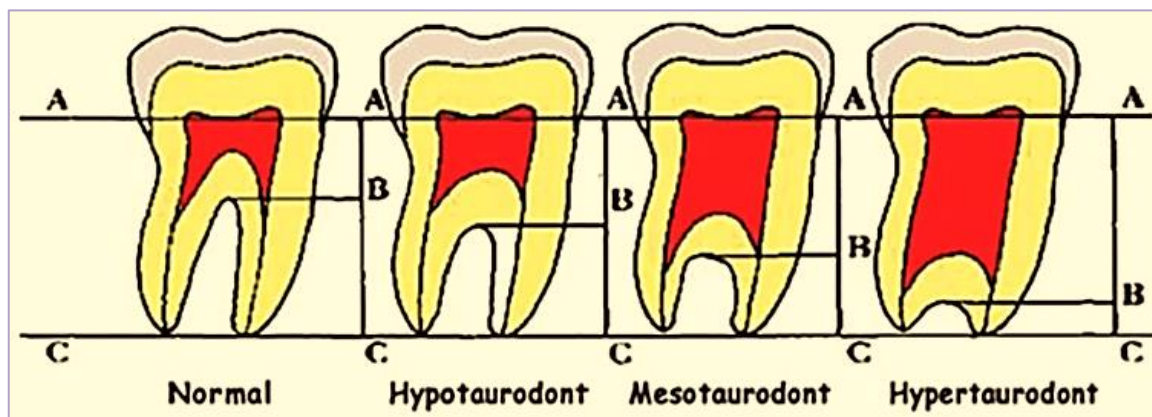


Figure 4. Witkop criteria for classification of taurodontic diagnosis¹

The pulpotomy technique in taurodontic teeth that must be considered is the determination of the location of the orifices. Taurodontic teeth may have root canals that differ in shape and number. Therefore, careful exploration of the groove is essential to identify orifices and additional channels among all orifices. Pulp tissue that is larger than normal can cause excessive bleeding during dental treatment and complete removal of necrotic pulp tissue can be difficult due to the orifice canal which is difficult to see. Irrigation using 2.5% NaOCl is possible many times so that the pulp chamber becomes clean.^{3,4,12} Several journals reporting the same case, used intermittent NaOCl irrigation followed by saline irrigation several times. Moreover, the addition of ultrasonic irrigation can help remove pulp tissue completely.⁴

The technique of filling the pulp chamber of taurodontia in pulpotomy is by vertical compaction of a wide pulp chamber. Conventional obturation materials such as *Zinc oxide eugenol* in large quantities may take longer to absorb which can delay the natural exfoliation of teeth. Endoflas can be used as an obturation material which is a combination of zinc oxide eugenol, iodoform, calcium hydroxide and barium sulfate. This material has the added advantage of a faster resorption rate due to the presence of calcium hydroxide and iodoform.^{2,4,12} Finally, it should be noted that in the case of sia-hypertaurodon (the pulp chamber almost reaches the apex and then breaks into two or four ducts) a vital pulpotomy rather than a pulpectomy may be considered as the treatment of choice.²

4. Conclusion

Taurodontia is a rare occurrence that requires a thorough clinical and radiographic examination to aid in proper diagnosis and treatment planning. Pulpotomy can be an endodontic treatment option for deciduous teeth with taurodontia based on objective and subjective consideration of the patient's condition.

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Authors Contribution

Contribution	Setianingtyas P	Ayuningrum LD
Concepts or ideas	√	√
Design	√	
Definition of intellectual content	√	√
Literature search	√	√
Experimental studies	√	√
Data acquisition	√	√
Data analysis	√	
Statistical analysis	√	√
Manuscript preparation	√	
Manuscript editing	√	√
Manuscript review	√	√



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