Original Article

Dilated Invaginated Odontome In A Lingually Inclined Mandibular Central Incisor: A Case-Report With 6 Months Follow Up

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DOI: 10.47750/pnr.2023.14.04.08

Abstract

It is rare to detect odontoma in periodontal practice, because of their indolent behaviour. Dens invaginatus is a developmental malformation related to shape of the teeth. Dilated invaginated odontome is most severe variant of dens invaginatus with dilation of root or crown. This dilated odontoma can be of many morphological variations. Only a few case reports were documented in the literature, with eruption of an odontoma. This report presents an unique case of dilated odontoma associated with an erupted tooth in the mandible anterior region which was lingually inclined, in a 17-years-old male patient.

Key-words: Dilated odontoma, lingually inclined, erupted

Key Messages: Occurrence of erupted dilated odontoma with lingulally inclined tooth is a rare phenomenon.

INTRODUCTION:

Dens invaginatus is a developmental anomaly resulting before calcification of the dental tissues by invagination of the enamel organ into the dental papilla.[1] The dilated odontome is the severe form of the dens invaginatus.[2] In some rare instances, the invagination may be dilated, disturbing the formation of the tooth, resulting in anomalous tooth development termed dilated odontome.[3] Matsusue[2] et al. reported that due to severe invagination, a dilated odontome shows a completely inverted hard tissue structure, seldom accompanied by central soft tissue.

Thoma and Goldman[4] in 1946 put together that the crown or root part of the tooth shows marked enlargement in dilated odontomes. Etiological factors include growth pressure on the dental arches during odontogenesis that account for infolding of the enamel and rapid proliferation of the internal enamel epithelium into the underlying dental papilla, infection or trauma. Dilated odontoma originates during the morpho-differentiation stage of tooth bud formation, but its precise aetiology and genesis are unknown. Genetic factors have also been suggested as a probable cause for occurrence of dilated odontoma.[5] Large and extremely dilated invaginations often have abnormal crowns and poses serious clinical implications, so it becomes an indespensible measure to extract the involved tooth.[6] To our knowledge only four cases of an erupted dilated odontoma were reported that were associated with supernumerary teeth, talon's cusp or enamel hypoplasia.

CASE REPORT

A 17 year old male patient came to the Department of Periodontology, SVS Institute of Dental Sciences, Mahabubnagar, India with the chief complaint of pain lower front teeth region since 2 months .The pain was a dull ache which was radiating and intermittent in nature. His medical and family history was non-contributory. There was no reported history of oro-facial trauma. On clinical examination gingival swelling was seen with lower right lateral incisor and lingually inclined lower right central incisor with a notch on the incisal edge that was confined to within the crown of the tooth (Figure 1). Adjacent teeth were mobile and are displaced with mesial

tilting. The overlying gingiva was edematous, hyperemic and sensitive to palpation (Figure 2).

This report presents an extremely rare case of an erupted dilated odontoma with lingually inclined crown occurring in the anterior mandibular region in a 17- year-old male, which, to the best of our knowledge, is the first ever case reported in literature.

Figure1: Intra-oral view

Figure 2: Lingually inclined mandibular right central incisor

A well-defined, round, radiopaque lesion, that was delineated by a thin radiolucent halo that was in contact with the root of lower right central incisor was observed on radiographic examination (Figure 3).

Figure 3: Radiovisiography showing radiopaque mass with surrounding radiolucent rim in the region of 41

Based on the clinical and radiographic findings, it was diagnosed as dilated odontome, the most severe variant of dens invaginatus seen involving mandibular right central incisor.

Surgical Treatment: After administration of local anesthesia, a buccal and lingual full thickness flap was raised extending from lower right canine to the lower left lateral incisor and a calcified mass around the tooth was observed after flap elevation. Osteotomy was performed around the root of lower right central incisor (Figure 4). The tooth was luxated with periosteal elevator and extracted almost shelling out with the tooth. Curettage of the site was done (Figure 5).

Figure 4: Full thickness mucoperiosteal flap elevation

Figure 5: Defect site after removal of lesion

Platelet rich fibrin (PRF) was prepared in accordance with the protocol developed by Choukroun et al 2001. Prior to surgery intravenous blood was collected in a 10ml sterile tube without the addition of any anticoagulant and immediately centrifuged in a centrifugation machine at 3000 revolutions per minute for 10 minutes (Figure 6). The fibrin clot layer was then separated using a pair of sterile tweezers (Figure 7). This fribrin clot was directly placed into the defect and suturing was done (Figure 8 and 9).

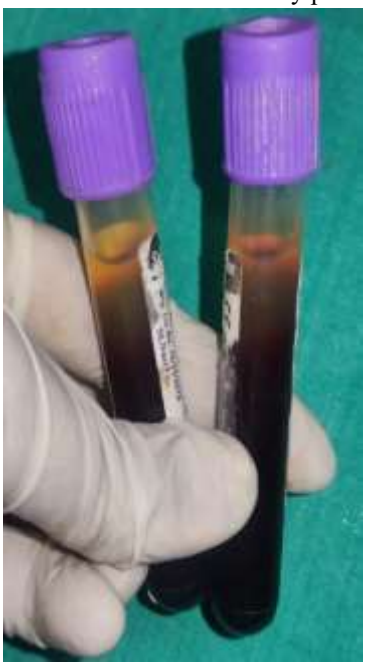

Figure 6: Collection of blood sample

Figure 7: Structured fibrin clot

Figure 8: Placement of PRF clot into the defect

Figure 9: suturing of the site

The healing after 5 months post operative period was uneventful clinically (Figure 10 and 11) and radiographically (Figure 12).

Figure10: Post – op 6 months intraoral view

Figure 11: Uneventful healing of the site

The healing after 6 months post operative period was uneventful clinically (Figure 10 and 11) and radiographically (Figure 12).

Figure 12: Radiovisiography after 6 months

Grossing

On grossing, a hard tissue tooth specimen measuring 1.5 × 2.5 cm, creamish white in color, oval in shape at apex was obtained. The specimen showed a smooth outline of crown and root of a central incisor. The tooth looked dilated in mesio-distal and labio-lingual direction with central hallow cavity. (Figure 13 and 14).

Figure 13: Labial view

Figure 14: Central hallow cavity at the apex

Histopathology Report

Examination of the haematoxylin and eosin (H and E) section under microscope revealed dentin made up of several dentinal tubules in cross section and invaginated portion of the tooth lined by dentin (Figure 15 and 16)

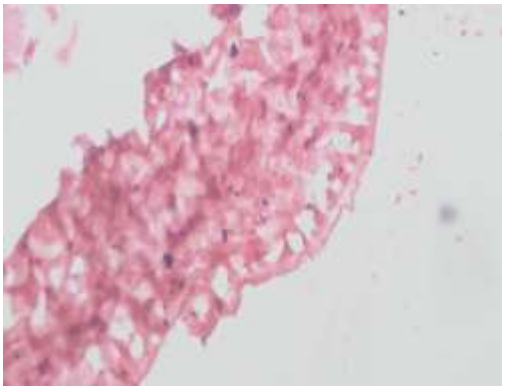

Figure 15: H and E section of odontome

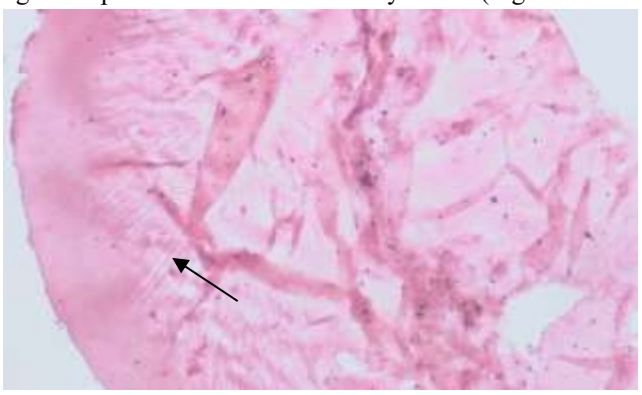

Figure 16: Arrow showing irregular dentinal tubules

DISCUSSION

There have been reports about the association of dilated invaginatus with other dental anomalies such as taurodontism, microdontia, supernumerary teeth, and short roots.[7] However, the presence of lingually inclined dilated odontomes is a rare occurrence. Most cases of dens invaginatus are often diagnosed during routine radiographs. A radiological study by Thomas has revealed an incidence of 7.74%. Another radiographic study reported that the incidence in maxillary lateral incisors, the most frequently affected teeth, is 9.66%. Some cases at the mandibular arch have also been reported, where the affected teeth were predominantly premolars.[5] Hamasha et al.[8] investigated the prevalence of dens invaginatus in Jordanian adults, and reported no cases in the mandibular arch.

Dental anomalies described in association with dilated invaginatus are microdontia, macrodontia, hypodontia, oligodontia, taurodontism, gemination and fusion, supernumerary teeth, dentinogenesis imperfecta, amelogenesis imperfecta, invagination in an odontome, multiple odontomes, coronal agenesis, and Williams syndrome, dens evaginatus, talon's cusp, short roots. Ekman-Westborg-Julin syndrome, Williams syndrome and Nance Huran syndrome are syndromes associated with dilated invaginatus.[9]

Oehler[10] classified dens invaginatus into three categories which were mostly accepted. Type I and Type II involves extension only into the crown and part of the root, respectively. In Type III A, invagination extends through the root and communicates laterally with the periodontal space through a pseudo-foramen, while in regard

with Type III B, no direct communication to the pulp, the extension communicates with the periodontium at the apical foramen. The incidence of Type III is the lowest with 5%, while Type II is the highest with 79%. The present report had the features of Type III B along with dilation. And the etiology may be growth pressure on the dental arches during odontogenesis causing infolding of the enamel.

Thoma and Goldman[4] classified dilated odontomas as a type of odontome. They classified odontome's as

- Germinated composite odontomes— it is two or more, more or less well-developed teeth fused together
- Compound composite odontomes— it is made up of more or less rudimentary teeth
- Complex composite odontomes—calcified structure, which bears no great resemblance to the normal anatomical arrangement of dental tissues
- Dilated odontomes— crown or root part of the tooth shows marked enlargement
- Cystic odontomes—an odontome that is encapsulated by fibrous connective tissue.

The differential diagnosis of this unusual appearance and localization of the radiopacity in the present case included odontoma, osteoma, cemento-ossifying fibroma, and osteoblastoma.[11] Compound odontoma present multiple rudimentary tooth like structures and are more common in the anterior maxilla. Often associated with an unerupted tooth. The osteoma is also a benign bone neoplasm, presents as a small, asymptomatic radiopacity with no radiolucent rim. Cemento-ossifying fibroma is a benign bone neoplasm, its radiographic appearance varies from a unilocular radiolucency to a radiopaque mass surrounded by a well-defined radiolucent rim. The osteoblastoma is a larger benign bone neoplasm that typically involves the posterior mandible.

In dens invanigatus, the invagination area is separated from the pulpal tissues with a thin layer of dentin and frequently interacts with the oral cavity. The invagination may be dilated and disturb the formation of the tooth, resulting in formation of dilated odontoma. This allows the entry of irritants and microorganisms, which usually leads to infection and necrosis of the pulpal tissue and then to a periodontal or periapical abscess.[12]

Clinical management of these anomalies varies among cases and is related to the degree of complexity of anatomy of the tooth. Treatment ranges from conservative procedures, non-surgical root canal therapy, or extraction.[13] The tooth in the present case was extracted because of the presence of a periapical lession, and the tooth morphology was not suitable for endodontic treatment. So, surgical extraction of odontome was the treatment of choice.

The term 'dilated odontoma' was coined to describe a severe kind of dens invaginatus and must not be considered as a type of odontoma, which is a hamartomatous tumour, based on the WHO's Classification of Head and Neck Tumours. Many reports evidenced the presence of unerupted dilated odontoma in posterior region. Erupted cases of dilated odontoma were described by Ranganathan Jaya et al.[14] where dilated odontome with talon cusp in a permanent maxillary central incisor was reported. Gaurav Sharma et al.[15] reported a case of an erupted dilated odontoma occurring in the supernumerary tooth in anterior maxillary region. Sangamesh S Halawar et al.[16] reported a case in accordance to this case report, of an erupted dilated odontoma in mandibular anterior region. Hunter et al.[17] reported bilateral dilated odontome with enamel hypoplasia.

The description of an erupted dilated odontoma is rare in the dentistry. Dilated odontoma is mostly seen in the posterior mandibular areas. The present case was presented with dilated odontoma with lingually tilted mandibular central incisor. So, regenerative management with platelet rich fibrin after surgical removal of this tooth will be helpful in the future multidisciplinary approach for orthodontic treatment or prosthetic replacement.

CONFLICT OF INTEREST

The authors reported no conflict of interest regarding this study.

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