An Incidental Finding of Bilateral Dens Invaginatus in Maxillary Molars – A rare case report

Dr. Jiji V. Unni[1], Dr. Deepak Daryani[2], Dr. Sreejan C. K.[3], Dr. Uthkal M. P.[4], Dr. Shabil Mohamed Mustafa[4], Dr. Uthara Menon[4]

[1]Post Graduate Student, [2]Prof and HOD, [3]Professor, [4]Reader

Department of Oral Medicine and Radiology,
Malabar Dental College and Research Centre, Edapal

Corresponding Author:
Dr. Jiji V. Unni, Department of Oral Medicine & Radiology,
Malabar Dental College and Research Centre,
Phone: 0494 2697021, Email: Jijivunni@gmail.com

Abstract

Dens invaginatus is a developmental anomaly occurring during odontogenesis resulting from invagination of a portion of crown (enamel organ). The etiology of dens invaginatus malformation is unknown. Most commonly seen in the permanent teeth and has a prevalence of 0.04-10%. Maxillary lateral incisors is the most commonly involved followed by the maxillary central incisors, premolars, canines and very rarely in the molars. Abscess formation, cyst development, and tooth displacement and internal resorption is seen in the untreated cases of dens invaginatus. This report presents a rare case of multiple dens invaginatus in permanent maxillary 1st molars.

Key words: Dens Invaginatus, Mesiodens, Maxillary Molars.

INTRODUCTION

Dens invaginatus is a developmental anomaly occurring during odontogenesis resulting from invagination of a portion of crown (enamel organ)[1]. In 1856 a dentist named 'Socrates' described dens invagination in a human tooth.[2]

The etiology of dens invaginatus malformation is unknown. The etiology of dental invaginations is explained by various theories in the last decades.

- Kronfeld (1934) suggested that focal failure of growth of the internal enamel epithelium results in invagination ,while the surrounding normal epithelium continues to proliferate and engulf the static area.[3]
- Rushton (1937) proposed that rapid and aggressive proliferation of a part of the internal enamel epithelium invading the dental papilla results in invagination[4].
- Oehlers (1957) considered that the formation of an enamel-lined channel ending at the cingulum or occasionally at the incisal tip is due to distortion of the enamel organ during tooth development and subsequent protrusion of a part of the enamel organ [5,6].
- Atkinson (1943) suggested during development external forces exerting an effect on the tooth germ[7].
- Genetic factor has been proposed to be the cause[8,9].
- Bhatt and Dholakia claimed that the radicular invagination usually results from an enfolding of Hertwig's root sheath and originates within the root after development is complete[10].

Oehlers described dens in dente according to invagination degree in three forms:

- Type 1: an enamel-lined minor form occurs within the crown of the tooth and not extending beyond the cemento-enamel junction;
- Type 2: an enamel-lined form which invades the root as a blind sac and may communicate with the dental pulp;
- Type 3: a severe form which extends through the root and opens in the apical region without communicating with the pulp.

Multiple dens invaginatus is an extremely rare dental anomaly .

Co existence of multiple radiographic findings in a clinically asymptomatic patient , although rare has been reported in literature. This article reports a rare case of multiple dens

Fig. 1

invaginatus, in maxillary molars with mesiodens.

CASE REPORT

A 7 year old boy reported with the complaint of multiple decayed teeth in the upper and lower arch associated with intermittent pain that aggravates on chewing food and relieves on its own, without any medication. The patient's medical history was non-contributory. Extra-oral examination revealed no significant findings.

An intraoral examination revealed the presence of all permanent teeth except for the left upper central incisor and erupting mesiodens, also multiple decayed teeth i.rw 54,74,84,85. As the clinical findings were inconclusive for diagnosis patient was subjected to panoramic radiography. Orthopantomogram gave a good idea about the position and morphology of unerupted left permanent central incisor in maxilla and erupting mesiodens. Dentinal caries i.r.w 54,74,84,85 was involving the pulp

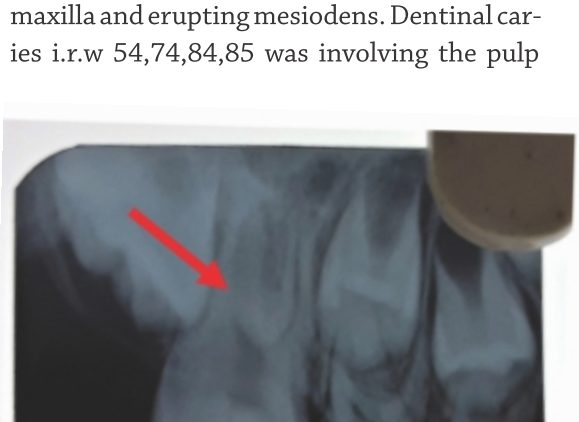

Fig. 2

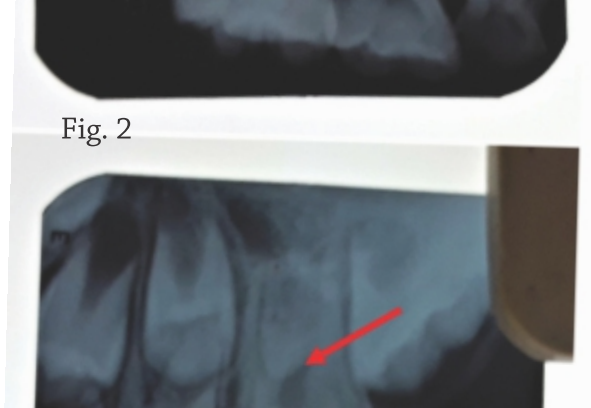

Fig. 3

suggestive of chronic pulpitis.

Along with this radiographic pathology an important incidental finding was observed on the radiograph. The OPG revealed dens in dente i.r.w 16 and 26 and impacted supernumerary tooth wrt 11, 12. [Figure 1]. Intraoral periapical radiograph i.r.w 16 and 26 revealed an invagination into the pulpal chamber of the tooth from the radicular portion suggestive of radicular dens in dente(densinvaginatus) [Figure 2 & 3].

Multidisciplinary treatment plan was planned: surgical removal of supernumerary tooth followed by orthodontic correction of the un-erupted maxillary inverted canine and endodontic management of 16 and 26.

DISCUSSION

Dens invaginatus occurs very rarely in the primary teeth but most commonly in the permanent teeth and has a prevalence of 0.04-10%[11,12,13]. Female to male predilection is 3 :1[11]. Clinically, it present as a deep palatal pit and remain unnoticed until through clinical examination is carried out.

Maxillary lateral incisors is the most commonly involved permanent teeth followed by the maxillary central incisors, premolars, canines and very rarely in the molars.[14]

Dens invaginatus is also classified into coronal and radicular variety. In radicular variety, two distinct types are present.[10]

The Type I is present as an axial in-folding of a wall of the root and it indicates an incomplete attempt at root bifurcation.

The Type II is regarded as true form of "DI" that is extremely rare and present as an opening on the root itself due to enamel-lined invagination within the root.

Usually intraoral periapical radiographs helps us in the detection of this anomaly. Abscess formation, cyst development, and tooth displacement and internal resorption is seen in the untreated cases of dens invaginatus.[15]

Radiologically they may vary in size and shape from a loop like, pear-shaped or slightly

radiolucent structure similar to a "tooth within a tooth"[16].

In literature there are many reports of dens in dente associated with other malformation, anomalies and some symptoms[17]. Table 1

Confirmatory diagnosis of radicular dens invaginatus can be done based on the histologic examination of that tooth.

CBCT which act as a 3rd eye plays an important role in the diagnosis by viewing the tooth in different planes and also in surgical intervention ,that to be performed safely and accurately.

The treatment options are prophylactic or preventive scaling of invagination, root canal treatment, endodontic apical surgery, intentional replantation and extraction.

In this case report, patient did not have any complaint related to radicular DI. For this reason, the patient was not willing for any treatment and therefore was recalled for follow-up sessions for every 3 months to assess the anomaly.

CONCLUSION

This report presents a rare case of multiple dens invaginatus in permanent maxillary 1st molars. No recent publications on this issue were found in the literature. The clinician should be aware of this anomaly because of the risk of apical inflammatory disease. Necrotic pulps and chronic periapical lesions are often associated with this anomaly without clinical symptoms.The prognosis of these invaginations turns out to be very interesting with a success rate of 90% when prophylactic treatment is applied on time before the onset of any pulp complication.

S.No.	Dental Anomalies
1	Microdontia
2	Macrodontia
3	Hypodontia
4	Oligodontia
5	Taurodontism
6	Germination and Fusion
7	Supernumerary Teeth
8	Amelogenesis Imperfect
9	Invagination in an Odontome
10	Multiple Odontomes
11	Coronal Agenesis
12	William's Syndrome
13	Mesiodens
14	Talon Cusp
15	Dens Evaginatus
16	Crouzon and Apert Syndromes

Table 1:
Dental Anomalies Associated with Dens Invaginatus [18,19]

REFFERENCES

1. Payne M, Craig GT. A radicular dens invaginatus. British Dental Journal. 1990;169(3-4):94-95.
2. Shulze C. Developmental abnormalities of the teeth and the jaws. In: Gorlin O, Goldman H, editors. Thoma's Oral Pathology. St.Louis: Mosby; 1970. pp. 96-183.
3. Kronfeld R. Dens in dente. J Dent Res. 1934;14:49-66.
4. Rushton MA. A collection of dilated composite odontomas. Br Dent J. 1937;63:65-85.

5. Oehlers FA. Dens invaginatus I. Variations of the invagination process and associated anterior crown forms. Oral Surg Oral Med Oral Pathol. 1957;10:1204-18.

6. Oehlers FA. Dens invaginatus II. Associated posterior crown forms and pathogenesis. Oral Surg Oral Med Oral Pathol. 1957;10:1302-16.

7. Atkinson SR. The permanent maxillary lateral incisor. Am J Orthod. 1943;29:685-98.

8. Hosey MT, Bedi R. Multiple dens invaginatus in two brothers. Endod Dent Traumatol. 1996;12:44-7.

9. Pokala P, Acs G. A constellation of dental anomalies in a chromosomal deletion syndrome (7q32): Case report. Pediatr Dent. 1994;16:306-9.

10. Oehlers FAC. The radicular variety of dens invaginatus. Oral Surgery, Oral Medicine, Oral Pathology Journal. 1958;11(11):1251-1260.

11. Canger E, Kayipmaz S, Celenk P. Bilateral dens invaginatus in the mandibular premolar region. Indian Journal of Dental Research. 2009;20(2):238-240.

12. Hülsmann M. Dens invaginatus: aetiology, classification, prevalence, diagnosis, and treatment considerations. International Endodontic Journal. 1997;30(2):79-90.

13. Canger EM, Çelenk P, Sezgin ÖS. Dens invaginatus on a geminated tooth: a case report. Journal of Contemporary Dental Practice. 2007;8(5):99-105.

14. White, SC; Pharoah, MJ. Oral radiology principles and interpretation. St Louis: Mosby; 2000. p. 314-315.

15. Tiku A, Nadkarni UM, Damle SG. Management of two unusual cases of dens invaginatus and talon cusp associated with other dental anomalies. J Indian Soc PedodPrev Dent 2004;22:128-33.

16. Gotoh T, Kawahara K, Imai K, et al. Clinical and radiographic study of dens invaginatus. Oral Surg Oral Med Oral Pathol1979;48:88-91.

17. Patel, S., Dawood, D. A., & Ford, T. P. (2007). The potential applications of cone beam computed tomography in a management of endodontic problems. Int Endod J, 40, 818-30.

18. Munir, B., Tirmazi, S. M., Majeed, H, A., Khan, A. M., &Iqbalbangash, N. (2011). Dens Invaginatus: Aetiology, Classification, Prevalence, Diagnosis and Treatment Considerations. Pakistan Oral & Dental Journal, 31(1), 191-198.

19. Dineshshankar, J., Sivakumar, M., Murali Balasubramanium, A., Kesavan, G., Karthikeyan, M., Srinivas Prasad, V. (2014). Taurodontism. Journal of Pharmacy and Bioallied Sciences, 6, s13-s15.