Journal of Oral Medicine, Oral Surgery, Oral Pathology and Oral Radiology 2022;8(2):101–104

Content available at: https://www.ipinnovative.com/open-access-journals

Journal of Oral Medicine, Oral Surgery, Oral Pathology and Oral Radiology

Journal homepage: www.joooo.org

Case Report

Dense-in-dente in mesiodense: Report of a rare duet

Nisheeth Saawarn[1,*], **Swati Saawarn**[2], **Rashmi Kiran Ekka**[1], **Himangi Srivastava**[3]

[1]*Dept. of Oral Medicine & Radiology, Bhabha College of Dental Sciences, Bhopal, Madhya Pradesh, India*
[2]*Dept. of Oral Pathology & Microbiology, Oral Pathology & Microbiology, Bhopal, Madhya Pradesh, India*
[3]*Xavier's Dental Clinic, Bangalore, Karnataka, India*

ARTICLE INFO

Article history:
Received 14-05-2022
Accepted 04-06-2022
Available online 18-06-2022

Keywords:
Dens in dente
Tooth abnormalities
Tooth supernumerary
Dens invaginatus
Mesiodens

ABSTRACT

Dens invaginatus is a developmental anomaly resulting from invagination of a portion of crown (enamel organ) during odontogenesis. Mesiodens is a supernumerary tooth present in the midline of maxilla between two central incisors. Very few cases of Dens invaginatus have been reported in a mesiodense. Through this article we are presenting a rare case of dens invaginatus occurring in a bulbous mesiodense in a 19 year old boy along with an additional adjacent supernumerary tooth, and a review of literature regarding the same. The patient had presented with complains of unaesthetic appearance. The clinical, radiologic and histologic examination revealed presence of Dens invaginatus Type II. The literature search showed that co-existence of dens invaginatus in a supernumerary tooth is a rare occurrence. As per the available literature, 12 such cases have been reported out of which three have been reported in impacted mesiodens and 3 cases of occurrence of dens invaginatus in mesiodentes.

1. Introduction

Dens invaginatus or dense in dente (DI) or 'Tooth within a Tooth' is an uncommon anomaly arising during tooth development prior to calcification, resulting from surface invagination of crown or root which is lined by enamel. This defect occurs in two forms- coronal and radicular and may vary from slight enlarged lingual pit to deep infolding extending upto the apex.[1–3] The prevalence varies from 0.3% to 38.5% with the permanent maxillary incisors most frequently being affected and bilateral occurrence in 43% of cases. Invaginated odontome, dilated composite odontome (Hunter 1951), Gestant anomaly (Colby 1956), tooth inclusion, dentoidindente and telescopic tooth are synonyms for this malformation.[4,5]

Mesiodens (multiple are termed 'Mesiodentes') is the most frequently occurring supernumerary tooth, located in the anterior midline of maxilla[2] and 0.15% and 1.9% is the reported occurrence in general population.[6]

Concomitant presence of dens invaginatus and mesiodentes is a rarity. This paper describes a unique association of dens invaginatus in a mesiodensleading to unaesthetic appearance.

2. Case History

A 19 year old boy reported to the department of oral medicine and radiology with the complaint of unaesthetic appearance of his upper front teeth. Medical and dental histories were not contributory. General examination indicated no abnormalities.

Intraoral examination revealed the presence of two additional teeth in the anterior maxilla, one conical-shaped and palatally placed in the first quadrant, while the other was bulbous and located at anatomical position of the permanent central incisor (21) in the second quadrant. Teeth 21 and

* *Corresponding author*.
E-mail address: drnisheethsaawarn@gmail.com (N. Saawarn).

https://doi.org/10.18231/j.jooo.2022.021

22 were malpositioned, labially and palatally respectively. The bulbous supernumerary showed deepened groove incisally (Figures 1 and 2). Radiographic investigation demonstrated enlarged pulp chamber with respect to the bulbous supernumerary.(Figure 3)

Fig. 1: Intraoral view- buccal-occlusal aspect showing affected mesiodense

Fig. 2: Intraoral view- palatalo-occlusalaspect showing affected mesiodense and additional supernumerary

Since these mesiodentes lead to malalignment and unesthetic appearance they were extracted. The one with abnormal morphology was sent for histological examination.(Figure 4) The patient was further referred for orthodontic treatment for the realignment of malpositioned maxillary left central and lateral incisors.

A Ground section of the specimen was prepared and scanned under the microscope. The icroscopic picture showed normal enamel and cementum on their respective locations. A pit on the external surface of enamel invagination as a blind sac, lined by enamel and extended below the cemento-enamel junction. However it did not communicate with the pulp (Figure 5). Based on the above findings a final diagnosis of dense in dente type II was made according to Oehlers classification.

Fig. 3: Intraoral periapical radiograph depicting enlarged pulp chamber in affected mesiodense

Fig. 4: Macroscopic view of longitudinal section of the extracted specimen showing invagination of enamel into tooth structure

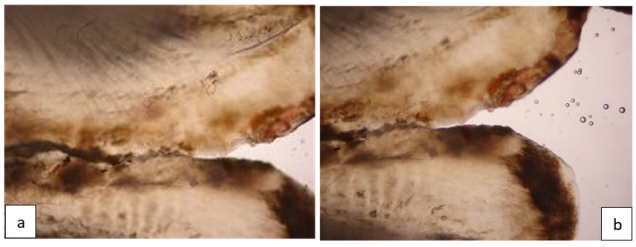

Fig. 5: Microscopic view depicting Enamel lined blind sac like invagination extending below the cemento-enamel junction and not communicating with adjacent pulp

3. Discussion

Dens in dente is a developmental anomaly resulting from an invagination of enamel organ into the dental papilla before calcification. It is of two types coronal and radicular.[1] Dens invaginatus (DI) was first described by 'Ploquet' in 1794 in a whale's tooth.[4,7] It was described by Salter as "a tooth within a tooth" in 1855.[8] In human it was first described by a dentist named Socrates in1856.[4,7]

Its etiopathogenesis is controversial. Several theories have been proposed, which include buckling of enamel organ under pressure from growing dental arch (Euler 1939, Atkinson 1943), focal growth failure of the internal enamel epithelium with continued proliferation of the surrounding normal epithelium (Kronfeld 1934), rapid and aggressive proliferation of a part of the internal enamel epithelium invading the dental papilla (Rushton1937), distortion and subsequent protrusion of a part of the enamel organ (Oehlers1957), fusion of two tooth-germs ('twin-theory' Bruszt 1950), infection (Fischer 1936 and Sprawson 1937) and trauma (Gustafson &Sundberg 1950).Association of genetic factors has also been reported (Grahnen 1962, Casamassimoet al. 1978, Ireland et al. 1987, Hosey & Bedi 1996).[4]

Among the different classifications recommended, Oehlers classification is the most extensively used. It classifies the entity in three classes, depending on how far the invagination extends from crown to the root. Type I is when an enamel-lined invagination is limited to the coronal part of the tooth and ends as a blind sac. In Type II, the enamel-lined invagination extends beyond cemento-enamel junction but is retained within the root canal. Type III represents an invagination which penetrates through the rootperforating at the apical area forming a second foramen in the apical or in the periodontal area. Amongst the three forms, Type I is the most common constituting 79%, followed by Type II (15%) and Type III (5%).[5]

In most cases, a dens invaginatus is detected inadvertently on the radiograph. Clinically, the invagination is often difficult to locate. Use of magnification and application of methylene blue dye can help illustrate the invagination.[3] Passage of infection is possible from the invagination into the pulp and into periodontal tissues leading to 'peri-invagination periodontitis'.[3] Periodontal infection is most commonly associated with Type II entity. Abscess formation, cyst and internal resorption are other complications.[7,9,10] Prophylactic or preventive sealing of the invagination, endodontic treatment, intentional replantation and extraction are the possible treatment options.[11]

Syndromes associated with it include Ekman-Westborg-Julin syndrome, Williams syndrome, Nance Huran syndrome, Tricho-dento-osseous syndrome and Postaxial polydactyly-dental-vertebral syndrome.[5,12]

Wide discrepancy exists in the reported prevalence of dens invaginatus. Colak et al in a radiological study on Turkish patients found dens invaginatus in 0.17% of the patients. Maxillary lateral incisor were most commonly affected (80% of cases), followed by maxillary canine (20% of cases).[13] The incidence of bilateral occurance was 25%. A retrospective radiographic study evaluating dental anomalies in Southeast Asian population in the Minneapolis reported prevalence of dens invaginatus and supernumerary to be 10.1% and 3.8%, respectively.[14]

Dental anomalies along with which dens invaginatus have been reported include supernumerary teeth, microdontia, macrodontia, hypodontia, oligodontia, taurodontism, fusion,germination and amelogenesis imperfecta.[5,15]

Mesiodens are the most common supernumerary teeth with the prevalence between 0.15% and 1.9%. Co-existence of dens invaginatus in a supernumerary tooth is a rare occurrence. As per the available literature, twelve such cases have been reported[9,15–20] out of which three have been reported in impacted mesiodens[15,17,19] and three cases of occurrence of dens invaginatus in mesiodentes.[9,18,20]

4. Conclusion

This case report highlights the rare association of supernumerary tooth with dens invaginatus. Dens invaginatus and supernumerary teeth together can result in a range of complications like delayed eruption, crowding, spacing, impaction, diastema, abscess, cystic lesion and root resorption. So early diagnosis and necessary management is imperative to avoid these. Since the mesiodentes in the present case, imposed esthetic problem and malocclusion, they were extracted.

5. Source of Funding

None.

6. Disclosure of Interest

The authors report no conflict of interest.

References

1. Neville BW, Damm DD, Allen CM. Oral & Maxillofacial Pathology. 2nd ed. Philadelphia, Penn Sylvania: VB Saunders Company; 2002. p. 80–2.
2. Regezi JA, Sciubba JJ, Jordan RCK. Oral Pathology. In: Clinical Pathologic Correlations. St. Louis, Missouri: Saunders; 2003. p. 369.
3. Alani A, Bishop K. Dens invaginatus. Part 1: classification, prevalence, aetiology. *Int Endod J*. 2008;41(12):1123–36.
4. Hulsmann M. Dens invaginatus: aetiology, classification, prevalence, diagnosis, and treatment considerations. *Int Endod J*. 1997;30(2):79–90.
5. Kallianpur S, Sudheendra US, Kasetty S, Joshi P. Dens Invaginatus (Type III B). *J Oral Maxillofac Pathol*. 2012;16(2):262–5.
6. Meighani G, Pakdaman A. Diagnosis and Management of Supernumerary (Mesiodens): A Review of the Literature. *J Dent (Tehran)*. 2010;7(1):41–9.

7. Sisodia S, Maria R, Maria A. Dens invaginatus -A review and case report. *Endodontology*. 2010;22:73–80.
8. Silberman A, Cohenca N, Simon JH. Anatomical redesign for the treatment of dens invaginatus type III with open apexes: a literature review and case presentation. *J Am Dent Assoc*. 2006;137(2):180–5.
9. Sulabha AN, Sameer C. Association of Mesiodentes and Dens Invaginatus in a Child: A Rare Entity. *Case Rep Dent*. 2012;2012. doi:10.1155/2012/198032.
10. Chen RJ, Yang JF, Chao TC. Invaginated tooth associated with periodontal abscess. *Oral Surg Oral Med Oral Pathol*. 1990;69(5):659.
11. Thakur S, Thakur NS, Bramta M, Gupta M. Dens invagination: A review of literature and report of two cases. *J Nat Sci Biol Med*. 2014;5(1):218–21.
12. Gorlin RJ, Cohen MM, Hennekam RCM. Syndromes of head and neck. 4th ed. New York: Oxford University Press, Inc; 2001.
13. Çolak H, Tan E, Aylıkçı BU, Uzgur R, Turkal M, Hamidi MM. Radiographic study of the prevalence of Dens Invaginatus in a sample set of Turkish Dental patients. *J Clin Imaging Sci*. 2012;2:34. doi:10.4103/2156-7514.97755.
14. Stecker SS, Beiraghi S, Hodges JS, Peterson VS, Myers SL. Prevalence of Dental Anaomalies in a Southeast Asian Population in the Minneapolis/ Saint Paul Metropolitan Area. *Northwest Dent*. 2007;86(5):25–8.
15. Patil PB, Chaudhari SG, Goel A, Agarwal P. Rare association of dens invaginatus with impacted mesiodens - A case report. *J Oral Biol Craniofac Res*. 2012;2(2):138–40.
16. Serrano J. Triple dens invaginatus in a mesiodens. *Oral Surg Oral Med Oral Pathol*. 1991;71(5):648–9.
17. Cantín M, Fonseca GM. Dens invaginatus in an impacted mesiodens: a morphological study. *Rom J Morphol Embryol*. 2013;54(3 Suppl):879–84.
18. Archer WH, Silverman LM. Double dens in dente in bilateral rudimentary supernumerary central incisors (mesiodens). *Oral Surg Oral Med Oral Pathol*. 1950;3(6):722–6.
19. Anegundi RT, Kaveri H, Patil SB, Punnya A. Double dens invaginatus in an impacted molariform supernumerary tooth: a unique case. *J Indian Soc Pedod Prev Dent* . 2008;26(Suppl 1):26–8.
20. Sannomiya EK, Asaumi J, Kishi K, Dalbengda S. Rare associations of dens invaginatus and mesiodens. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod*. 2007;104(2):41–4.

Author biography

Nisheeth Saawarn, Professor & HOD https://orcid.org/0000-0002-8197-7379

Swati Saawarn, Professor & HOD https://orcid.org/0000-0001-7197-7853

Rashmi Kiran Ekka, Reader

Himangi Srivastava, Dental Surgeon & Oral Physician

Cite this article: Saawarn N, Saawarn S, Ekka RK, Srivastava H. Dense-in-dente in mesiodense: Report of a rare duet. *J Oral Med, Oral Surg, Oral Pathol, Oral Radiol* 2022;8(2):101-104.