

Dens in dente: A rare case report involving mandibular lateral incisor

Kalpana S Rai¹, Prathamesh S Rai², Vanishree H S³

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^{1&2}Senior Lecturer

Dept of Conservative & Endodontics Hitkarni Dental College & Hospital Jabalpur Madya Pradesh, India

³Senior Lecturer

Dept of Pedodontics & Preventive Dentistry Hitkarni Dental College & Hospital Jabalpur Madya Pradesh, India

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Email for correspondence:

anandop2005@rediffmail.com

ABSTRACT:

Dens in dente, also known as dens invaginatus which are of three types, characterized by a deep invagination of the surface of a crown or root covered with enamel. Hence pulpitis and necrotic pulps are often associated with this anomaly. Dens invaginatus is clinically significant due to the possibility of pulpal involvement, pulpitis, necrotic pulps and chronic periapical lesions. An early diagnosis is crucial and requires thorough clinical examination. Here we report a case with mandibular lateral incisor which is rare to occur with these teeth.

Key words: dental anomaly, dens invaginatus, mandibular lateral incisor.

INTRODUCTION

Dens in dente also known as dens invaginatus. Dens Invaginatus (DI) is a dental anomaly which results from invagination of enamel organ into dental papilla, beginning at the crown and sometimes extending into the root before calcification. Dens in dente are characterized by a deep invagination of the surface of a crown or root covered with enamel and has an incidence of 0.04 to 10% in the general population. According to the extent of the invaginations, dens in dente have been classified as Type I: where the invagination is confined to the crown. Type II: invagination extends from under the cemento-enamel junction ending in a blind sac that can or cannot communicate with the pulp. Type III: an invagination that extends through the root

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perforating the root apex or its vicinity without communicating with the pulp.^{1,2}

Clinical examination may reveal a deep fissure or pit on the surface of an anterior tooth. Due to the tortuous lingual anatomy, it is possible for caries to develop inside the invagination without any clinically detectable lesion. Since the enamel lining is thin and in close proximity to the pulp chamber, a carious lesion could easily perforate the pulp chamber. Further, there are sometimes thin canals within the enamel of the dens invaginatus, forming a direct communication with the pulp. Hence pulpitis and necrotic pulps are often associated with this anomaly DI is clinically significant due to the possibility of pulpal involvement, pulpitis, necrotic pulps and chronic periapical lesions. An early diagnosis is crucial and requires thorough clinical examination of all teeth especially lateral incisors. Dens invaginatus are known to be associated with other abnormalities such as taurodontism, microdontia, talon cusp, gemination, supernumerary tooth, dentinogenesis imperfecta, short roots and with some medical-dental syndromes.³ Literature study shows that, DI is commonly seen in maxillary teeth and involvement in mandibular teeth is rare, In Sweden, a retrospective study of a 30-year period found 131 teeth with DI in 91 patients and did not report any mandibular DI among these patients.⁴ A review of the English language literature only showed 10 cases involving 13 mandibular teeth.⁵

Case report A 18 year-old female patient with non-contributory medical history reported to HDCH Jabalpur Madhya Pradesh India. The extra-oral exam revealed no significant findings. Intra-orally, the gingiva and the oral mucosa were normal in appearance. The patient's dental arch contained the normal number of teeth and the left permanent mandibular lateral incisor had unusual crown morphology [Figure 1]. In the conventional radiographs, it is not always possible to determine, with great precision, the relationship between the invaginated portion of the tooth with the chamber and/or the root canals. Radiographic examination showing presence of a radiopaque invagination of

the enamel and dentine extending till the root apex with a large radiolucent that is suggestive of DI type III and a periradicular lesion [Figure 2]. The pulp vitality test was negative and a clinical diagnosis of pulp necrosis with periradicular lesion was made. The incisor was anesthetized and isolated and a coronal access was prepared. Three root canal openings were located [Figure 3]. The large and irregular volume of the root canal system makes proper shaping and cleaning difficult. Most difficulty in this case was in establishing the working length.

After administering local anaesthesia the mandibular incisor was isolated with a rubber dam. Access cavity preparation was performed by using Endo-Access diamond bur (Dentsply, Maillefer, Baillaigues, Switzerland). After the modifications in the access opening, initial investigation of the root canal system in all the canals was performed with a size 10 K-file (Dentsply, Maillefer). All the canals were instrumented to an apical size 25 by hand. Individual canal flaring and biomechanical preparation was performed with Protaper universal (Dentsply, Maillefer) rotary nickel titanium files till F2. During instrumentation, a total of 100 ml of 3% sodium hypochlorite was used for the irrigation of the canals of the mandibular incisor. The irrigation was supported by ultrasonic cleaning of the root canal system. After completion of the chemo-mechanical preparation, root canals were dried with sterile paper points. Obturation was done with warm vertical condensation technique using non-standardised gutta-percha cones and AH-26 sealer (Dentsply, De Trey, GmbH, Konstanz, Germany). Access cavity was restored with Glass ionomer cement. The large and irregular volume of the root canal system makes proper shaping and cleaning difficult. Irrigation, supported by ultrasonic cleaning of the root canal system has been described as an efficient means of disinfection and has therefore been recommended for cleaning of the complex morphology of the root canal system in teeth with dens invaginatus. For obturation of such teeth warm gutta-percha techniques including vertical condensation or thermoplastic filling techniques have been recommended.⁶ RCT was performed.

Discussion: There is a lack of consensus on the aetiology of dens invaginatus the cause of DI is still unknown and controversial, possible mechanisms of this phenomenon may be listed as: (1) abnormal pressure from the surrounding tissues, (2) rapid and aggressive proliferation of a part of the internal enamel epithelium invading the dental papilla, (3) local growth retardation, (4) invagination of the crown before calcification of the teeth, (4) infection and (5) genetic factors.^{5,7}

Hallet introduced the term dens invaginatus in order to clarify the point that enamel is located centrally and the dentine peripherally due to the invagination. Since then it has been a preferred term, although dens in dente is a more commonly used term. Bhatt and Dholakia have described a radicular variety of double DI. It is thought to be the result of an invagination of Hertwig's epithelial root sheath. This results in an accentuation of the normal longitudinal root groove. In contrast to the coronal type where it is lined with enamel, the radicular type defect is lined with cementum.⁵

Diagnosis of DI should not be confused with fusion or gemination of the teeth, fusion is considered as the union of two normally separated tooth buds with the resultant formation of a joined tooth with confluence of dentin. Fusion is defined as a single enlarged tooth or joined (i.e., double) tooth in which the tooth count reveals a missing tooth when the anomalous tooth is counted as one.

Gemination can be defined as an attempt of a single tooth bud to divide, with the resultant formation of a tooth with a bifid crown and usually, a common root and root canal.

Gemination is defined as a single enlarged tooth or joined tooth in which the tooth count is normal when the anomalous tooth is counted as one.⁸ Radiographic examination plays a key role there.

There have also been case reports of dens invaginatus occurring in the primary dentition, however, all the documented case reports are of males which, if a true reflection, contrasts to the permanent dentition where females appear to be more at risk.⁹

Root canal treatment of teeth with type III DI extending to the apical area in combination with a large periradicular lesion can cause difficulties because of the unpredictable shape of the internal anatomy. If no entrance to the invagination can be detected and there are no signs of pulp or periapical pathology, no treatment is required. However, if signs and symptoms of pulp or periradicular pathology are present, treatment is necessary. Non-surgical endodontic treatment should be attempted first. Regardless of the size of the periradicular lesion, surgical treatment is the second option to be used only after non-surgical endodontic treatment has failed. The success of this and other cases indicates that the size of the periradicular lesion does not dictate the treatment procedure or influence the treatment outcomes of non-surgical root canal therapy.⁴

Dens invaginatus requires an early diagnosis and treatment as they are more prone to pulp pathosis resulting from bacterial ingress. The treatment ranges from prophylactic restoration of deep groove to extensive periradicular surgery in combination with endodontic therapy depending upon extent of involvement.¹⁰

However, despite the limitations of these studies, the widely held view is that teeth affected with dens invaginatus are associated with an increased risk of developing pulpal problems, the risk of pulpal complications associated with dens invaginatus is therefore probably related to the inherently poor anatomical features both on a macro and microscopic level that encourage bacterial contamination. For this reason, early diagnosis is important to prevent the need for possibly complex and difficult endodontic procedures at a later date.¹¹

Conclusion: The available evidence suggests that the condition is associated with an increased prevalence of pulp disease and that any necessary endodontic treatment may be difficult because of aberrant anatomy, clearly, there is a need for further scientific investigation of this condition.¹¹ However, long-term clinical follow-up is necessary of these treated anomaly.



Figure 1: clinical photograph of DI appearing as localised Macrodontia

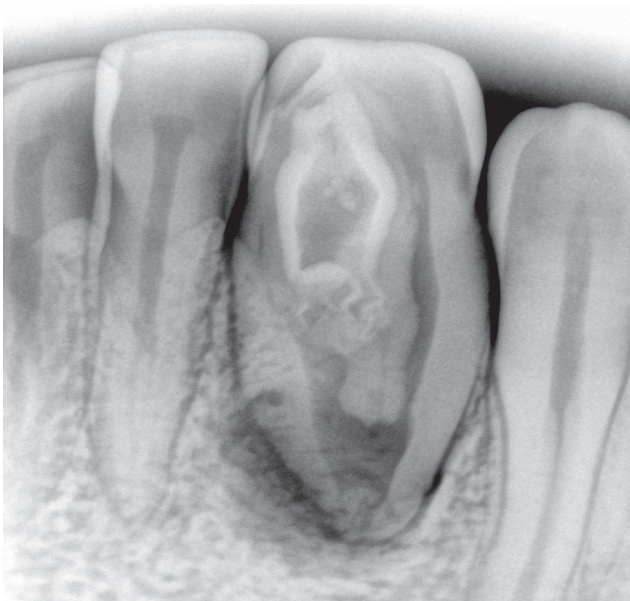


Figure 2: left permanent mandibular lateral incisor, dens invaginatus type III and radiolucency suggestive of periradicular lesion

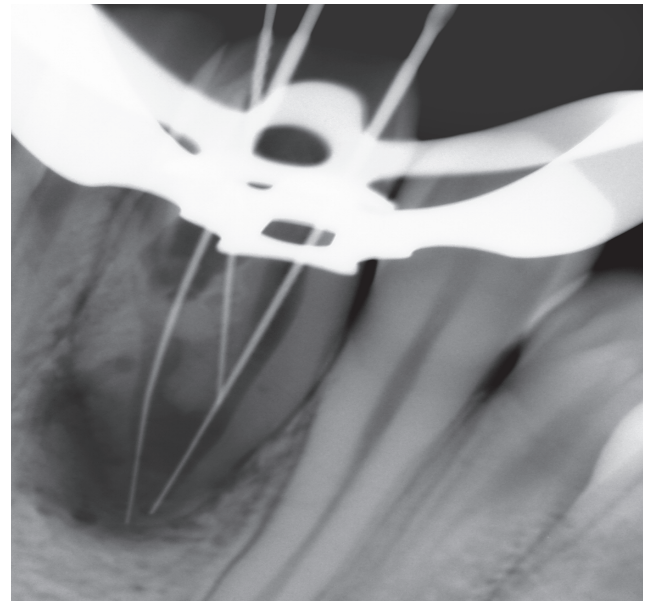


Figure 3: radiograph revealed three root canal openings of DI.

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