Case Report
Dens in dente: A minimally invasive nonsurgical approach!

Vivek Hegde, Abdul Morawala, Abhilasha Gupta, Naqiyaa Khandwawala
Departments of Conservative Dentistry and Endodontics and Pedodontics and Preventive Dentistry, M.A. Rangoonwala College of Dental Sciences and Research Centre, Pune, Maharashtra, India

Abstract
Dens invaginatus, also known as dens in dente, is a rare anomaly affecting human dentition. The condition results in invagination of an amelodental structure within the pulp. This case report discusses the current management protocol of dens invaginatus using a minimally invasive and nonsurgical treatment option. As with most conditions, early diagnosis and preventive measures help minimize complications in dens invaginatus cases.

Keywords: Dens invaginatus; microscope; minimally invasive; nonsurgical

INTRODUCTION
“Dens in dente” is a developmental malformation incident due to the in folding of enamel and dentin or an accentuation of the lingual pit of an incisor before calcification sets in. Various causes of this condition have been proposed which include focal growth retardation (Kronfeld 1934), infection (Fischer 1936, Sprawson 1937), rapid proliferation of a part of the inner enamel epithelium into the dental papilla (Rushton 1937), increased localized external pressure (Euler 1939, Atkinson 1943), fusion of two tooth germs (Bruszt 1950), trauma (Gustafson and Sundberg 1950), distortion and protrusion of the enamel organ during tooth development (Oehlers 1957), and absence of signaling molecules for morphogenesis and therefore, genetic factors are involved (Grahnen et al., 1959, Casamassimo et al., 1978, Ireland et al., 1987, and Hosey and Bedi, 1996). The maxillary lateral incisor is most commonly affected and one of the reasons being the external forces applied on the lateral incisor tooth bud by the developing central incisor or canine which develops 6 months prior.

Many classifications have been elaborated on the clinical and radiographic appearances of this anomaly. However, Oehlers classification is most widely used due to its ease of application [Figure 1a] with the only disadvantage being that it fails to explain the true extent and complexity of the invagination as it is based on the radiographic representation. Therefore, a classification for treatment protocol needs to be devised on the basis of advanced three-dimensional (3D) imaging.

A wide array of treatment modalities ranging from the placement of sealants to retrograde fillings is rendered on the severity of invagination. Success in endodontic treatment is achieved when a tooth has predictable morphology that can be easily debrided by cleaning and shaping followed with a 3D obturation. Atypical anatomy confirms difficulty in the endodontic treatment.

CASE REPORT
A female patient aged 13 years referred to the Department of Conservative Dentistry and Endodontics in M. A. Rangoonwala Dental College, Pune, for evaluation and treatment of constant pain and draining sinus in relation to maxillary anterior tooth [Figure 1b]. Clinical examination revealed tenderness and sinus tract in the buccal mucosa associated with the maxillary left lateral incisor. The radiograph showed complex tooth anatomy with an

Access this article online
Quick Response Code: www.jcd.org.in
DOI: 10.4103/0972-0707.190014

How to cite this article: Hegde V, Morawala A, Gupta A, Khandwawala N. Dens in dente: A minimally invasive nonsurgical approach!. J Conserv Dent 2016;19:487-9.
extended area of periapical radiolucency. Medical and family history was noncontributory. Close examination of the orthopantomogram revealed altered tooth morphology in relation to the affected tooth. A clinical diagnosis was established of dens invaginatus.

For better understanding of the crown-root morphology, cone beam computerized tomography (CBCT) was performed to confirm the diagnosis as dens invaginatus Type IIIb [Figure 1c].

Initial access preparation showed four orifices that were confirmed by the help of microscope (Moller-Wedel) of magnification (×16) and mesially and distally angulated radiographs. The canals were prepared using hand and mechanical instrumentation after establishment of working length by the apex locator. The canals were intermittently irrigated with 5% NaOCl and saline, and calcium hydroxide dressing [Figure 2a] was placed for the periapical pathology.

The patient was recalled at regular intervals of 3, 6, 9, and 12 months [Figure 2b-e] to monitor the periapical pathosis, and the calcium hydroxide dressing was replaced. On further canal preparation, communication was seen resulting in one canal splitting into two in the apical region. After 12 months, good healing of the periapical lesion was observed. Obturation of the canals was done at 1 year and 2 months using down pack and backfill technique with elements obturating system (Sybron Endo) [Figure 2f]. The postoperative restoration was done using packable composite resin BISFIL CORE (Bisco, Schaumburg, IL, USA). The patient was recalled every month for review till complete healing of the periapical lesion was observed [Figure 2f].

**DISCUSSION**

Conventional and digital radiography renders 3D anatomical structures two dimensionally with inherit distortions in different planes. This limitation posts a steep learning curve for novice operators to interpret information from the resulting images. CBCT gives us a 3D view of the image allowing us to view it in different planes. In endodontics, in the above case presented, CBCT helped in diagnosing the altered tooth morphology which further helped in proper treatment planning.

Dens invaginatus can be present in varying degrees of severity and is prone to infection. Its histology confirms a thin layer of enamel and dentine separating the pulp tissue which can be hypoplastic and may predispose to the entry of irritants and thereby lead to necrosis of the pulp and infection. According to Oehlers classification, the case was den invaginatus Type III, where the additional canal located palatal to the main canal extended till the apex of root separately without communicating with the main canal.

Although the case had a periapical lesion, since the root was well formed and had apical constriction, a
A conservative orthograde approach was chosen. The use of calcium hydroxide as long-term intracanal medicament is well documented. It certainly reduces the bacterial counts and helps the tissues to recover and heal. Healing of the intraoral sinus is also a positive indicator to show that the treatment rendered was working efficiently. For teeth with complex anatomy where satisfactory debridement is difficult to achieve as in this cases of dens in dente, a good shaping followed by maximum cleaning, optimum irrigant interaction with the root canal dentin, and a good coronal seal is the key to obtaining a successful treatment outcome. Periodic follow-up of the case at 3, 6, 9, and 12 months also played an important role in healing of the periapical lesion. If on follow-up appointments, the lesion is seen to persist or increase, then a surgical intervention is warranted. The current treatment protocol includes early detection of the lesion, prophylactic or preventive sealing of the invagination, root canal treatment, endodontic apical surgery, and intentional replantation.

**CONCLUSION**

Treatment of dens in dente has phased into an endodontic approach from an extraction-oriented one, but with the advent of newer elaborate diagnostic tools. Clinically, microscopes have a massive contribution in the success of endodontic therapy not only in teeth with atypical morphology but also teeth with normal anatomy.\(^9\)

**Financial support and sponsorship**

Nil.

**Conflicts of interest**

There are no conflicts of interest.

**REFERENCES**

1. Rushton MA. A collection of dilated composite odontomas. Br Dent J 1937;63:65-85.
2. Casamassimo PS, Nowak AJ, Ettinger RL, Schlenker DJ. An unusual triad: Microdontia, taurodontia, and dens invaginatus. Oral Surg Oral Med Oral Pathol 1978;45:107-12.
3. Oehlers FA. Dens invaginatus (dilated composite odontome). I. Variations of the invagination process and associated anterior crown forms. Oral Surg Oral Med Oral Pathol 1957;10:1204-18.
4. Örnell KA, Swanbeck G, Lindahl B. Dens invaginatus. II. A microradiographical, histological and micro X-ray diffraction study. Acta Odontol Scand 1960;18:303-30.
5. Pai SF, Yang SF, Lin LM. Nonsurgical endodontic treatment of dens invaginatus with large periradicular lesion: A case report. J Endod 2004;30:597-600.
6. Häusmann M. Dens invaginatus: Aetiology, classification, prevalence, diagnosis, and treatment considerations. Int Endod J 1997;30:79-90.
7. Sponchiado EC Jr., Ismail HA, Braga MR, de Carvalho FK, Simões CA. Maxillary central incisor with two root canals: A case report. J Endod 2006;32:1002-4.
8. Šutalo J, Knežević A, Negotević-Mandić V. Endodontic treatment of dens invaginatus: Case report. Acta Stomatol Croat 2004;38:215-8.
9. Ruprecht A, Sastry KA, Batniji S, Lambourne A. The clinical significance of dental invagination. J Pedod 1987;11:176-81.