

## TOOTH WITHIN A TOOTH

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### ABSTRACT

Endodontic treatment for teeth that exhibit the dental anomaly called "Dens Invaginatus" is very difficult due to the operator's inaccessibility to the diseased pulp in the complex root anatomy. Surgical intervention and extraction are the common approaches to deal with this condition.

### INTRODUCTION

'Dens in dente' meaning 'tooth within a tooth' is a rare developmental anomaly of the tooth affecting mostly the permanent maxillary lateral incisors and less commonly the other permanent teeth and the primary dentition. It is also called as 'dens invaginatus' or 'dilated composite odontome'. This condition is characterized by the infolding or inversion of the enamel into the tooth structure, during the early stages of tooth bud formation. This gives an appearance of an in-growing tooth.<sup>[1]</sup> Dens invaginatus is commonly diagnosed as an incidental radiographic finding unless the patient presents with pain or swelling associated with the involved tooth. Severe form of dens in dente affects the entire morphologic structure of the tooth. The incidence of dens invaginatus is reported to range between 0.04% and 10%<sup>[2]</sup> with a higher male predilection than females.

Several causes of this condition have been proposed. These include localized external pressure, focal growth retardation and focal growth stimulation in certain areas of the tooth bud. Roentgenographically it is recognized as a pear-shaped invagination of the enamel and dentin with a narrow constriction at the opening on the surface of the tooth. The significance of dens in dente is its predisposition to early decay, pulp necrosis and periapical cyst.<sup>[3]</sup> This is believed to be due to the patients inability to keep the defect free of cariogenic plaque.<sup>[4]</sup>

Oehlers FAC<sup>[5]</sup> in 1957 classified this defect into three possible variations:

Type I: The enamel invagination is limited to the dental crown short of the cementoenamel junction(CEJ).

Type II: The defect penetrates beyond the CEJ into the dental root; the pulp chamber may or may not be involved

Type III: The invagination extends beyond CEJ reaches the periodontal tissues and has a separate apical foramen communicating with the periapical tissues

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This case report describes a *dens invaginatus* with bizarre root canal anatomy which was successfully treated by non-surgical endodontics.

**Key words:** *Dens in dente, Dens Invaginatus, case reports.*

Management of malformation aims to prevent degeneration of the invaginated enamel. Variations such as type II and type III require complicated endodontic or surgical intervention. This case report describes the non-surgical management of a complicated type III variant of *dens in dente*.

### CASE REPORT

A 22-year-old female presented with swelling and pain in the gums in the anterior region of the upper jaw (Patient reported on 7<sup>th</sup> April 2005). The patient gave a history of recurrent swelling in the same region for the past six months which subsided on its own. On examination a mild firm swelling was present in the gingiva in relation to the upper left lateral incisor. A sinus tract opened in the facial gingiva in relation to this tooth. There was no evidence of pus discharge from this sinus tract. The tooth exhibited a different external morphology resembling a conical tooth [Fig 1] unlike the trapezoidal morphology of a normal lateral incisor [Fig 2]. It was tender on percussion and showed delayed response to tooth vitality tests which indicated that the tooth was turning non-vital.

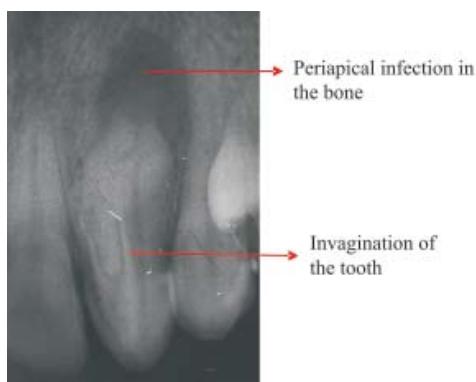


**Fig 1:** Conical appearance of the Dens in Dent lateral incisor



**Fig 2:** Trapezoidal appearance of a normal lateral incisor

The radiographic examination revealed that the tooth was invaginated till the apical third of the root with the presence of periapical radiolucency. The root canal morphology appeared more complex radiographically for the invaginated tooth [Fig 3] unlike a normal lateral incisor [Fig 4]. This led us to diagnose the tooth as type III dens invaginatus with periapical abscess.

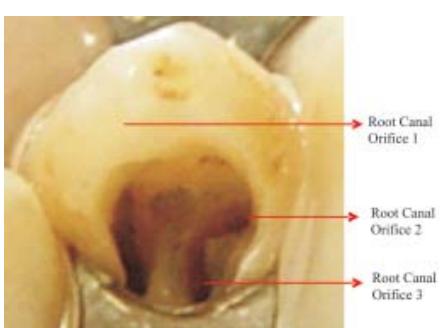


**Fig 3:** Radiographic appearance of dens in dente

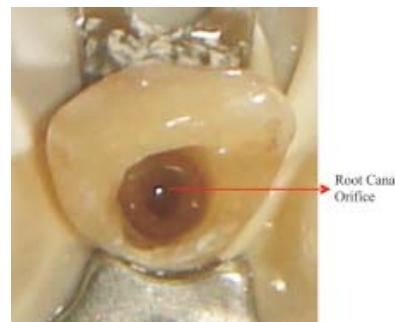


**Fig 4:** Radiographic appearance of normal lateral incisor

Root canal treatment was initiated for the lateral incisor. On opening the access to the root canal, two canals mesial to and separate from the main root canal system were present [Fig 5]. This finding is in contrast to the normal morphology of a maxillary lateral incisor which has only one root canal [Fig 6]. All the three root canals in this tooth were separate from each other throughout its length. Mild pus discharge was evident from all the canals suggesting the presence of an abscess in the periapical tissues.



**Fig 5:** Access opening of dens in dente showing three root canals



**Fig 6:** Access opening of normal lateral incisor showing one large root canal

Root canal treatment was completed in two visits with an inter-appointment dressing of calcium hydroxide. Radiographs were taken post operatively to confirm the integrity of the root canal filling. Figure 7 shows the post operative sixth month follow-up radiographic appearance of the filled root canals of the invaginated tooth showing satisfactory bone healing peripherally. This can be compared with the radiographic appearance of a root canal treated normal lateral incisor with single canal in figure 8. At the second appointment two weeks later, the sinus tract was found to be completely healed and there was no evidence of swelling in the gingiva. The final restoration of the tooth was done and then patient was reviewed for clinical and radiological signs of healing after 1, 3 and 6months (October 2005). The patient was asymptomatic and did not have any recurrence of symptoms in the affected tooth.



**Fig 7:** Radiographic appearance of obturated (filled) dens in dente showing three canals (sixth month follow-up)



**Fig 8:** Radiographic appearance of obturated (filled) normal lateral incisor showing one root canal

## DISCUSSION

Bacterial contamination of the invagination resulted in development of infection and periapical inflammation. Treatment of *dens invaginatus* is a complex procedure because of its atypical root canal anatomy.<sup>[6]</sup> The success of the root canal treatment in these teeth depends on identifying all the additional canals and restoring the same. This case showed the presence of three root canals instead of one. Identification of the complex root canal anatomy of this case and management of all the canals non-surgically, has improved the prognosis of the tooth. Calcium hydroxide, used as an inter-appointment dressing in the root canals, helped in healing the periapical infection and disinfecting the root canals<sup>[6]</sup> owing to its anti-microbial and tissue dissolving properties. This resulted in early elimination of the root canal infection thereby avoiding surgical intervention. The success of this non-surgical endodontic treatment of the *dens invagination* was demonstrated by the resolution of the patient's signs and symptoms with radiographs showing periapical bone healing in the subsequent follow-up examinations.

## CONCLUSION

*Dens invaginatus* can be recognized before the eruption of the tooth from periapical radiographs. So these teeth should be treated prophylactically as soon as possible after tooth eruption. Early diagnosis and intervention can definitely prevent pulpal necrosis and the potential loss of tooth. The nonsurgical endodontic management of the complex root canal morphology of these teeth is a successful alternative to the more invasive surgical

intervention. Operator skill in locating these abnormal courses of the root canals will eliminate the procedural errors which could occur while searching for the canal in its normal position. Knowledge about such unexpected variations in root canal anatomy and its immediate conservative treatment is the key to the successful management of the anomalies of tooth.

## REFERENCES:

- 1) Mauro Caldari, Carlo Monaco, Leonardo Ciocca, Roberto Scotti. Single session treatment of a major complication of *dens invaginatus*: A case report. *Quintessence Int*, 2006; 37: 337 – 343.
- 2) Hovland E, Block R. Non-recognition and subsequent endodontic treatment of *dens invaginatus*. *J Endod*, 1977; 3: 360 – 362.
- 3) Tsurumachi T, Hayashi M, Takeichi O. Non-surgical RCT of *dens invaginatus* type 2 in maxillary lateral incisor. *Int Endodontic J*, 2002; 35: 310 – 314.
- 4) Joseph A Regezi, James J Sciubba, M. Anthony Pogrel. *Atlas of Oral and Maxillofacial Pathology*, 1<sup>st</sup> ed, W.B.Saunders, Pennsylvania, 2000.
- 5) Oehlers FAC. *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 – 1218.
- 6) Hieke Steffen and Christian Spleith. Conventional treatment of *dens invaginatus* in maxillary lateral incisor with sinus tract: One year follow up. *J Endod*, 2005; 31: 130 – 133.