

# Dens Invaginatus : A Case Report

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## Abstract

A case is reported documenting successful treatment of periapical lesion involving in a maxillary right lateral incisor with dens in dente. Conventional endodontic therapy was performed and partial resolution of the lesion was evident at periodic 1 month interval, 3 month interval, 6 month interval and complete resolution was observed at 1 year interval.

## Introduction

It is a tooth anomaly also referred to as dens in dente or dilated composite odontome. This condition is a developmental variation which arises as a result of an invagination in the surface of the tooth crown before calcification has occurred. The cause may be increased localized external pressure, focal growth retardation and focal growth stimulation in certain areas of tooth bud. The most commonly affected tooth is maxillary lateral incisor. The condition is mostly noted in Caucasians, Asians and Africans. There is no sex predilection but condition exhibits high degree of inheritance. This condition is recognized roentgenographically.

Coronal dens invaginatus can be of three types according to their radiographic appearances.

1. Those invaginations which are enamel lined and confined within the crown of the tooth
2. Those invaginations that extend towards the root but do not cross the cemento enamel junction
3. Those invaginations that penetrate the surface of the root and 'burst' apically or laterally to produce a second foramen in the root. A portion of type III invagination may on occasion be lined by cementum and may or may not be dilated.

Radicular variety of double dens invaginatus is thought to be as a result of invagination of Hertwig's epithelial root sheath. This results in an accentuation of normal longitudinal root groove. In contrast to coronal type where it is lined by enamel,

the radicular type defect is lined with cementum.

Due to tortuous lingual anatomy carious lesion may initiate without any clinical detectable lesion. Since the enamel lining is thin and is in close proximity to pulp, caries can further involve the pulp. Sequelae to the condition is necrotic pulp and pulpitis. A condition also comes up as syndrome occurring in association with anomalous teeth and sensorineural hearing dental loss.

## Case Report

A 22 year old married female reported with chief complaint of off and on pus discharge from gums in relation to upper right front tooth since past few months. Medical history was non-contributory. Past dental history dictated that patient had boil on palatal aspect of upper right front tooth around 2 years back which was treated by some locality doctor and patient was relieved. Clinical evaluation showed a healthy female with no physical abnormalities. On intra-oral examination it was noted that 22 was absent 14 and 24 were rotated in the arch. The site of complaint in relation to 12 appeared normal with sound tooth structure and apparently normal gingiva. On vitality testing tooth was found avital. There were no signs of intraoral sinus opening or presence of any fistula in relation to tooth in question. Adjacent soft tissues seemed normal. No lymphadenopathy or presence of T.M.J. discrepancy was noted.

Radiographic examination revealed a typical pear shaped invagination of enamel and dentin with narrow constriction at opening on surface of the tooth closely approximating pulp in its depth was noted in relation to 12. Infolding of enamel lining showed more radiopacity than the surrounding tooth structure and can be identified. Periapical radiolucency in relation to 12 was obvious. This radiolucency is about 6mm around the periapex and along lateral aspect of 12 distally. The nature of radiolucency appeared homogenous. (Fig. 1)

Diagnosis of type III dens invaginatus and a radiolucid image at the apex of 12 was

made on account of radiographic interpretation in relation to the same.

A conventional endodontic treatment was performed. A coronary opening was accomplished with endoaccess bur (dentsply) to gain a straight line access. With the aid of no.2 straight tip (Mallifer-dentsply, Baillagues, Switzerland), the presence of two canals was detected. There was no communication between the main and invaginated canals. The two canals work length was established at 1mm from the radiographic apex. (fig.2) The biomechanical preparation was accomplished by preparing the cervical and middle thirds with G.G.drills no.1 and 2 (Mallifer-dentsply, Baillagues, Switzerland), and the surgical diameter was determined with no.40K file (Mallifer-dentsply, Baillagues, Switzerland). With every instrumentation special care was taken for irrigation with 0.5ml of 5.25% sodium hypochlorite. After preparation root canals were dried with absorbent points (Mallifer-dentsply), the intra canal medication composed of calcium hydroxide associated with physiologic serum was administered at 30 days intervals for 3 months period. The tooth was then obturated with warm thermoplasticizing technique (Thermaprep) using AH-26 endodontic sealer (Kerr) and corresponding thermoplasticized gutta percha cones. (fig.3) The first follow-up visit was accomplished done after 6 months of performing case (fig.4) with a follow up period of 4 years. (fig.5)

## Discussion

The present case demonstrates occurrence of type III dens invaginatus in tooth 11 with a periapical lesion. Dens invaginatus puts a challenge to endodontic treatment due to its complicated root canal system. Type I and type II, the invaginations can be removed, transforming a tooth into single canal followed by conventional root canal therapy. Challenge is more in type III cases where endodontic anatomy is more complex. Surgical treatment is an option but non-surgical treatments have also been reported.

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The case was treated non-surgically for as far as possible non-surgical intervention should be carried out. Another upcoming option was to attempt revascularization but due to presence of periapical lesion in association with this tooth revascularization was not found suitable for the favourable result of this case. Moreover it is also documented that revascularization attempted in incomplete root formation does show more promising results.

Teeth with invagination are susceptible to caries due to pulpal topography that serves as retention material as well as structural defects at these areas due to poor enamel formation. Thin canals communicating with the pulp provide pathways for microorganisms and their byproducts causing pulpal infection and necrosis. Invagination of type III dens invaginatus often permits communication to oral irritants and microorganisms directly into pulpal cavity which causes pulpal necrosis and development of periapical lesions soon after tooth eruption. In cases of early clinical or radiographic detection of this type of invagination with no signs of pulp pathology, fissure sealing and restorations can effectively be accomplished. Considering

the clinical progression of type III dens invaginatus, some points should be noted. Taking into consideration of necessity for fast liberation of Calcium ions an aqueous medium was used with calcium hydroxide after completing biomechanical preparation with abundant amount of sodium hypochlorite as irrigant. Another important point to be mentioned is about the dens invaginatus filling which required a technique to fill the wide and bulky cavity in the present case due to enamel invagination. So, thermoplasticised technique was opted to provide excellent sealing. Radiographic and 4 year long follow up of the reported case showed success in the case demonstrating that conventional endodontic treatment through orthograde approach is useful in case of type III dens invaginatus.

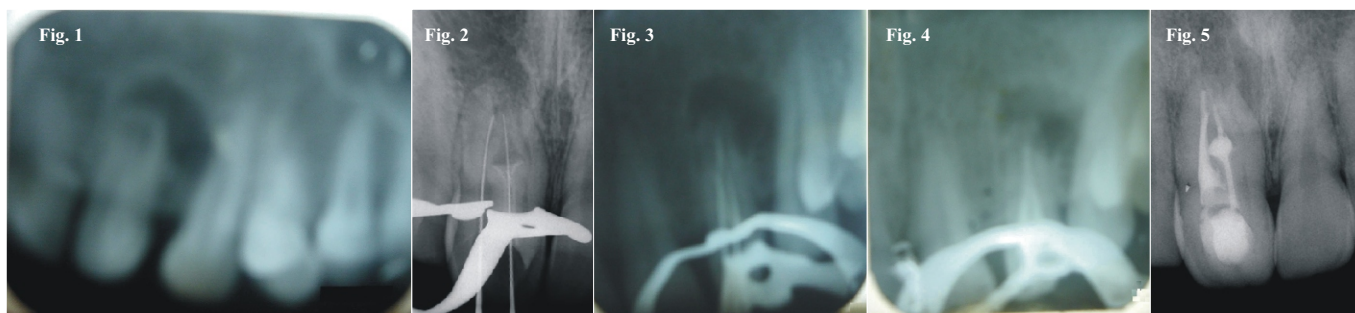
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**Legends**

Fig.1 Preoperative X-Ray Fig.2- Working Length X-Ray  
 Fig.3 Post-operative X-ray  
 Fig.4 Post-operative X-ray (After 6 Months Follow up)  
 Fig.5 Post-operative X-ray (After 4 Years Follow up)



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