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Non Surgical Management of Dens Invaginatus: A Case Report

Jyoti Ahlawat[1], Abhimanyu Sharma[2], Sana Chawla[3], Abhishek Singh[4]
[1](M.D.S.,Conservative Dentistry and Endodontics, India)
[2](M.D.S Oral & Maxillofacial Surgery, Senior Research Associate, CSIR,
ESIC Dental College, New Delhi, India)
[3](B.D.S, General Practitioner, New Delhi,India)
[4](M.D.S. Orthodontics, India)

Abstract: *Dens invaginatus is a developmental anomaly of teeth characterized by deepening or invagination of the enamel organ in the dental papilla before calcification occurs. Such a condition is often associated with dental caries, pulpal and periodontal pathology in teeth. Wide variety of treatment options including placing sealants or filling materials as conservative protocol ranging to performing endodontic therapy of cases presenting with pulpal/periodontal pathology. This article discusses case reports of a tooth with Dens Invaginatus with emphasis on diagnosis, treatment planning for cases with invaginated teeth. The purpose of this paper is to present a clinical case report of a type III dens invaginatus, identified on maxillary left lateral incisor,wherein conventional non surgical endodontic therapy was adopted as the line of treatment.*
Key Word*: Dens in dente, dens invaginatus, developmental anomaly, dilated composite odontome, case report*

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I. Introduction

Dens invaginatus has been described as a developmental anomaly resulting from the disorganisation of the enamel organ during the soft tissue stage of development. The involved tooth consists of a deepening or invagination of the enamel organ within the dental papilla before calcification occurs**.**[1,2] Synonyms for this malformation are: Dens in dente, invaginated odontome, dilated gestant odontome, dilated composite odontome, deep foramen caecum, tooth inclusion, dentoid in dente, gestant odontome, dents telescopes.

Several theories have hinted at elucidating the etiology of this malformation but it still remains controversial. It was hypothesised by Kronfeld (1934) that the invagination could have occurred due to a focal failure of growth of the innner enamel epithelium while the encircling normal epithelium continues to proliferate and engulfs the static area.[3] Another possible explanation put forward by Oehlers (1957) suggested that distortion of the enamel organ during the developmental cycle of a tooth germ, the development and subsequent protrusion of an element of the enamel organ resulting in formation of an enamel-lined channel ending at the cingulum or occasionally at the incisal tip.[4]

The prevalence varies from 0.25 – 10% betting on the kind of classification.[5] Numerous classification systems have been put forward as per the clinical and radiographic appearance of the invagination, however the most commonly used one is that given by Oehlers (1957), which relies on the extent of the invaginated dental tissue.

- ***Type I***: The invagination is confined within the crown of the tooth and doesn't extend beyond the level of the external cementoenamel junction (CEJ).
- ***Type II***: The invagination is extending apically beyond cementoenamel junction, where communication between the invagination and pulpis possible.
- ***Type III***: The invagination extending beyond cementoenamel junction and exhibiting a second foramen into the lateral periodontal ligament or periradicular tissue.

Majority of cases come to light only at the time of routine radiographic examination. Clinical examination reveals a morphologic alteration of the crown or a deep foramen coecum which further helps in establishing a diagnosis. Treatment options for dens invaginatus consist of preventive sealing or filling of the invagination, root canal treatment either associated or not with endodontic apical surgery, intentional replantation and extraction.[6,7,8] The present case report discusses the treatment of type III dens in dente.

II. Case Report

A 17 year-old female patient was referred to the Department of Conservative Dentistry & Endodontics from Department of Orthodontics for management of the maxillary left lateral incisor. Past dental history obtained from the patient revealed that she had visited department of orthodontics for the treatment of malaligned teeth. It was noted during clinical examination that the left lateral incisor demonstrated abnormal morphology along with absence of caries, restoration or trauma. Tooth was tender on percussion and discoloured. Radiographic evaluation confirmed impacted canine and dens in dente type III with respect to left lateral incisor (Fig.1). The periapical area appeared to be painful on palpation. Vitality tests were negative. Contra lateral tooth was normal in shape and vital. Non surgical root canal treatment of left lateral incisor was decided as the treatment plan followed by continuation of fixed orthodontic appliance therapy.

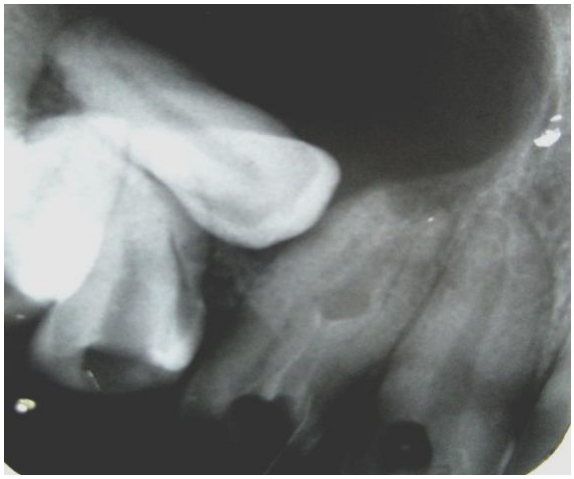

Figure 1 – Preoperative radiograph.

After isolation with rubber dam , access preparation was completed and two canal orifices were located (Fig. 2). Working length was determined with apex locator (Root ZX, J. Morita, Tokyo, Japan) and radiograph. The canals were instrumented with k-files (Maillefer, Dentspy, Ballaigues, Switzerland) and irrigated with sodium hypochlorite and EDTA.

After canal preparation, obturation was done with Gutta percha cones (Maillefer, Dentspy, Ballaigues, Switzerland) and AH Plus sealer (Maillefer, Dentspy, Ballaigues, Switzerland) using lateral condensation technique (Fig. 3).

Figure 2: Access cavity preparation

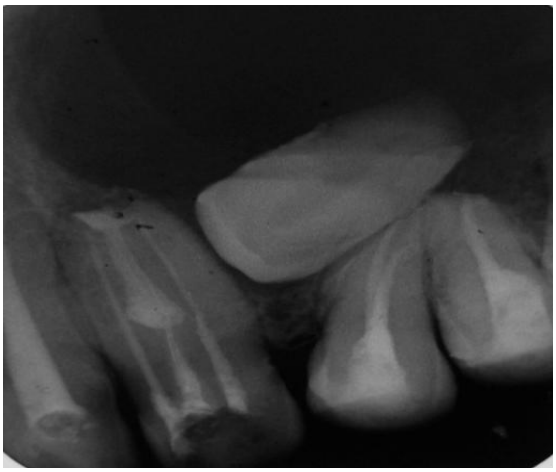

Figure 3: Post obturation radiograph

III. Discussion

Teeth presenting with dens invaginatus are often related to increased incidence of pulpal infection and apical pathosis, especially in type III cases where the invagination extends apically. The invagination in type III cases may have communication with oral cavity, allowing penetration of microorganisms into the pulpal space.[9] Henceforth an early diagnosis and management of such cases is of paramount importance. Prophylactic treatment are often performed via fissure sealing or restorations. However in cases presenting with pulpal and periapical pathology, treatment protocol may necessitate complicated procedures including surgical procedures apart from the conventional root canal treatment.[10,11,12] The current case report demonstrates that root canal treatment of two cases of dens invaginatus type III. Often treatment can become complicated as a result of unpredictable internal anatomy of the canal system. The invaginated tissue compresses the main canal at different levels, due to which the canal may become irregular, circular or narrow.[13,14] Therefore achieving complete disinfection of canal becomes even more important for successful treatment outcome. In current cases, canal disinfection was done by using sodium hypochlorite as irrigant and placing calcium hydroxide as intracanal medicament.

Non surgical endodontic therapy is often the primary line of treatment in management of such cases. Periapical surgery is indicated where conventional root canal treatment has failed and canal morphology does not allow adequate cleaning of root canal space, thus leading to treatment failure. However in these cases, healing occurred after performing non surgical root canal treatment and patient was asymptomatic at recall intervals.

IV. Conclusion

Historically endodontic treatment of teeth with severe Dens Invaginatus was deemed impractical. Treatment options were then limited to extraction. The dramatic improvements in endodontic armamentarium have made possible the conservative treatment of such anomalies. The present case report has shown treatment of type III dens invaginatus cases. Furthermore, it is of critical importance that the clinician has a detailed knowledge of the anatomical variations of such nature which contribute in achieving a successful treatment outcome.

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