

### **Preventive management of a dens invaginatus: a case report**

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#### **Abstract**

Dens invaginatus (DI) is a malformation of the tooth. It manifests as deepening or invagination of the enamel organ into the dental papilla prior to calcification of the dental tissues. This anatomical originality makes the DI a preferred target for carious lesions that can quickly lead to pulpal infection and / or periradicular pathology. The maintenance of pulpal vitality as well as the respect of the integrity of periradicular status represents the key objectives of a preventive management guarantee of a better prognosis.

**Keywords:** Preventive, Management, dens invaginatus, Case report.

#### **Abbreviation**

DI: Dens Invaginatus.

CCTDR: Center of Consultation and dental treatments of Rabat.

CEJ: cement-enamel junction.

CDI: Coronal Dens Invaginatus.

CBCT: Cone Beam Computed Tomography.

2-D: two-dimensional.

#### **Introduction**

Dens invaginatus (DI) is a developmental dental anomaly where there is an invagination of the enamel organ into the

dental papilla, before calcification is complete [1]. Its prevalence is between 0.04% and 10% with a predilection for maxillary lateral incisors and a bilateral occurrence in 43% of cases [2; 3]. As a result, an in folding of the enamel into dentine occurs which creates a pocket of organic material underneath the enamel surface. These lesions are clinically relevant as bacteria from the oral cavity can contaminate and propagate within these malformations, leading to the development of early caries and consequently disruption of root formation (in an immature teeth), secondary to pulp necrosis [1]. This article reports one case of dental invagination. It emphasizes that the early diagnosis and prophylactic treatment of these lesions is important if pulp vitality is to be maintained.

#### **Case Report**

An 8 year old boy with no particular medical history consulted the department of pedodontics-prevention in the Center of Consultation and dental treatments of Rabat (CCTDR) for dental caries care. The dental examination showed the presence of incisal notching in 12, 11, 21 and 22 teeth (Figure 1) as well as the presence of medium deep cavities at the coagulum of the 11 and the 21 (Figure 2). In the affected teeth, the vitality test was norm-positive and there was no occurrence of pain caused to the vertical

percussion. The adjunctive periodical radiographic examination was performed. It showed the presence of radiolucent pockets underneath the coagulum and incisal edges of affected teeth. These pockets is surrounded by radio-opaque enamel and confined to the crown (not extend beyond the level of the cement-enamel junction (CEJ)). The same radiograph also revealed the absence of per apical lesion in the four immature upper incisors. The root canal system of teeth with coronal dens invaginatus type I(CDI) is relatively simple, and the use of Cone Beam Computed Tomography(CBCT) in this type has not been reported until now. We concluded then to a « dens invaginatus » type I according to Oehlers classification (Figure 3).The management began with rigorous oral hygiene instructions reinforced by dietary advices, also adequate brushing method with a toothpaste dosed at 1500 ppm of fluoride. A professional prophylactic cleaning of dental surfaces including 11 and 21 cingulum was performed with a dry brush (Figure 4). Subsequently, the palatal surface of the affected teeth was filled with fissure sealant (Figure 5).A periodic clinical and x-ray follow-up is essential for monitoring the pulpal vitality, periodontal integrity and for sealing 12 and 22 after their complete eruption.

### Discussion

Dens invaginatus (DI) is a malformation of the tooth. It manifests as deepening or invagination of the enamel organ into the dental papilla prior to calcification of the dental tissues [1].The prevalence of DI is reported being between 0,3% and 10%. The permanent teeth more frequently affected by this anomaly are the upper lateral incisor (90% versus 6.5% of posterior teeth) followed by the maxillary central incisor, while it is rare in the primary teeth [4].The etiology of DI remains unclear. DI might be caused by a focal failure of growth of the internal enamel epithelium leading to proliferation of the surrounding

normal epithelium with eventual engulfment of the static area. According to Oehlers, distortion of the enamel organ occurs during the tooth development and results in protrusion of a part of the enamel organ. Furthermore, infection, trauma, and genetics have been suggested as possible contributing factors [1; 5].This anomaly may occur concomitantly with other dental anomalies such as hypodontia, hyperdontia, or macrodontia [6]The clinical appearance of the crown in DI varies considerably; the morphology maybe normal or it may display unusual forms, such as a peg shape, barrel shape or taloncusps. The first clinical sign of an invaginatus tooth might be a deep foramencaecum lined by hypo mineralized brittle enamel where caries can rapidly develop, enabling microorganisms from the oral cavity to directly penetrate into the pulp, causing pulp necrosis and the development of apical periodontitis. The most clinically relevant and widely used classification system for DI was proposed by Oehlers. He divided CDI into three forms according to their radiographic presentation (Figure 6):

### Conclusion

In the presented case, preventive treatment success was based on early diagnostic and on adequate treatment planning. All efforts should aim to maintain pulp vitality or preserve the invaginated tooth by the least invasive method.

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#### Legends Figures



**Fig 1:** Clinical presentation of the case. Almost perfect incisors with incisal notching (yellow arrows).



**Fig 2:** A deep foramen caecum on the palatal surface of the teeth which is the entrance of the invagination (black arrows). Teeth 12, 11, 21 and 22 were all found to be vital.