



Dens Invaginatus: prophylactic management

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Abstract

Dens invaginatus is thought to be as a result of distortion of the enamel organ during tooth development and the subsequent protrusion of a part leading to the formation of a linear enamel canal that ends at the cingulum, or at the incisal border, producing an irregular crown shape. Food debris may become packed in this area with resultant caries and pulp necrosis and periradicular inflammation. The permanent maxillary lateral incisors are the most commonly involved teeth and bilateral involvement is not unusual.

Case Report

This is a report of bilateral involvement of the maxillary incisors with associated carious involvement of the coronal pits in a 43year old man with a high caries index. Composite filling of the palatal pits of the involved teeth was done as a prophylactic treatment to prevent carious exposure of the pulp and subsequent periradicular pathology.

Conclusion.

Prophylactic filling of the coronal pit is recommended to avoid pulpal and periradicular complications that may warrant extensive and expensive treatment or even loss of the involved tooth.

Keywords: Dens invaginatus, prophylactic composite filling

Introduction

Dens invaginatus has been referred to by several names including tooth within a tooth, dens in dente, invaginated odontoma, dilated gestant odontoma, dilated composite odontoma, tooth inclusion, and dentoid in dente^(1,2). The aetiology of this developmental condition remains unknown but causes have been proposed including an increased localized external pressure, focal growth retardation, and focal growth stimulation in certain areas of the tooth bud⁽³⁾.

Kronfeld⁽⁴⁾ thought dens invaginatus to be caused by a failure in growth of the internal dental epithelium while at the same time there is also a proliferation of the surrounding normal epithelium. Oehler⁽⁵⁾ considered it to be as a result of distortion of the enamel organ during tooth development and the subsequent protrusion of a part leading to the formation of a linear enamel canal that ends at the cingulum, or at the incisal border, producing an irregular crown shape. The condition has been classified into 3 types according to the depth of the invagination and the degree of communication with the periodontal ligament or the periradicular tissue⁽⁵⁾.

Type I: Invagination confined inside the crown, not extending beyond the cementum enamel junction (CEJ).

Type II: Invagination extending beyond the CEJ, it may or may not communicate with the pulp and not reach the

periradicular tissue.

Type III: Invagination extending beyond the CEJ penetrating the root and exhibiting a second foramina in the apical third within the periradicular tissue.

This developmental anomaly of the tooth shape is said to be fairly common with reported incidence of 0.04-10%⁽⁶⁻⁹⁾. The permanent maxillary lateral incisors are the most commonly involved teeth and bilateral involvement is common⁽¹⁻¹⁰⁾. Cases involving mandibular teeth, deciduous dentition and double dens invaginatus in teeth have also been reported⁽¹⁰⁻¹⁵⁾.

Clinically, a morphologic alteration of the crown or a deep foramen coecum can serve as an indication for the diagnosis of dens invaginatus. Food debris may become packed in this area with resultant caries and pulp necrosis and periradicular inflammation⁽¹⁾. Radiographically, it may appear as a pear-shaped invagination of enamel and dentine with a narrow constriction at the opening on the surface of the tooth and closely approximating the pulp in its depth while in the more severe form, it may exhibit an invagination that extends nearly to the apex of the tooth⁽³⁾. The defect on the crown may be difficult to keep free of plaque or bacteria and thus predisposes the tooth to caries, pulpitis and subsequently peri-radicular inflammation.

Prophylactic filling of the pit is recommended to avoid these complications⁽²⁾. Prophylactic filling can also be planned for unerupted teeth that may have been diagnosed

radiographically. Other treatment that have been described in the management of complications associated with dens invaginatus include nonsurgical endodontic treatment, endodontic surgery, intentional replantation and extraction⁽¹⁷⁻¹⁹⁾. Cases with immature root with open apex have been successfully treated with the use of calcium hydroxide to stimulate apexification or the use of mineral trioxide aggregates (MTA) to achieve immediate closure of the apex of the root as an alternative to the traditional apexification technique⁽²⁰⁻²⁵⁾.

This is a report of bilateral involvement of the maxillary incisors with associated carious involvement of the coronal pits in a 43 year old man with a high caries index.

Case Report

A healthy 43 year old Nigerian male presented at the Conservative Dentistry Clinic of Lagos University Teaching Hospital complaining of toothache from a tooth in the left maxilla. He had no significant medical history. Clinical and radiographic examinations revealed highly tender endodontically treated Tooth 25 with significant coronal tissue loss. Other findings include poor oral hygiene, carious teeth were: 12, 22, 34 and 44; filled teeth 14, 15, 17, 27, 35, 36, 37, 45 and 48; missing teeth 24, 38, 46 and 47 (DMFT Score was 17). Other intraoral findings included periodontitis involving 45 and V-shaped pits on the palatal surface of the teeth 12 and 22.



Figure 1. Discoloured palatal pits on tooth 12 and 22

The labial shape and size of the maxillary lateral incisors (12 and 22) appear clinically normal but the palatal surfaces of these teeth presented with narrow V-shaped pits with brownish discoloration and softened tooth tissue within the depth of the pit. There was no associated sensitivity to probing or attempted excavation of the softened tooth tissue using a probe indicating that only the enamel might be involved by caries (Figures 1 and 2). Periapical radiographs revealed that each crown had a radiolucent area, not in communication with the pulp. There were no periradicular radiolucencies and the apices of the teeth were closed (Figures 3). Based on these findings, a diagnosis of Type I dens invaginatus was made.



Figure 2. Probe inserted in V-shaped pit on palatal surface of tooth 12

Of interest to us was that this patient claimed he had never been told of this abnormality despite having been to the dentist several times in his adult life. The importance of this finding, the implications on the long time health of the tooth and the planned prophylactic filling of the defect with composite was explained to the patient. Composite filling of the palatal pits on tooth 12 and tooth 22 were done using light cured microhybrid composite material (Natural Elegance, Henry Schein Inc. Melville, USA).

A small round bur in a water cooled hand piece was used to widen the pit for easy excavation of caries and the margins of the v-shaped defect were bevelled. Acid etchant (Etch Gel 40%, Henry Schein Inc. Melville, USA) was applied for 15 seconds and rinsed off. Bonding agent, (Natural Elegance, Universal Bond Henry Schein Inc. Melville, USA) was applied and cured. Flowable composite resin (Natural Elegance, Henry Schein Inc. Melville, USA) was extruded into the pit and cured. The defect extending to the incisal edge was restored with microhybrid composite resin. Occlusion was checked to be satisfactory before the patient was discharged from the clinic.

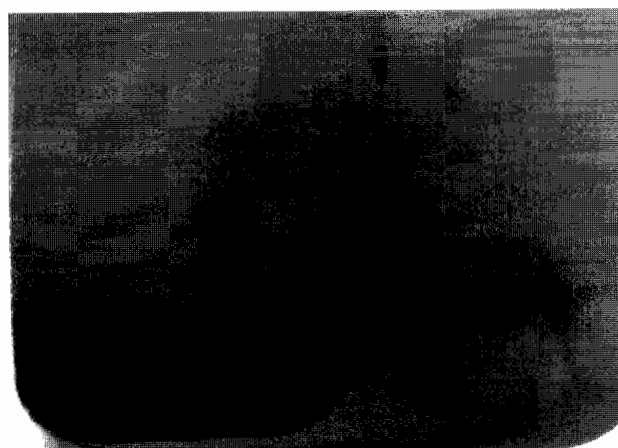


Figure 3. Radiograph showing area of radiolucency within the crown of tooth 12



Discussion

The incidence of dens invaginatus is reported to be fairly common ranging from 0.04% - 10%⁽⁶⁻⁹⁾, however there seem to be no record of the incidence of this condition among the Nigerian population. Most of the literature^(1-3, 9, 21, 25) are silent about gender predilection of this condition, but majority of the cases^(20, 21, 25) reported were of male individuals. This case also reports occurrence of dens invaginatus in a male adult. Bilateral occurrence of the maxillary incisors is the commonest pattern of involvement and this case also supports this findings⁽¹⁻¹⁰⁾.

The present case is a type I as classified by Oehlers⁽⁶⁾.

Radiographically, it involved only the coronal area of the teeth. A radiolucent area within the crown that does not communicate with the pulp was evident (Figures 3). However, a classical palatal pit was noticeable on the crowns of the teeth. (Figures 1 & 2). These palatal pits were already involved by caries. We noted that if the morphological tooth anomaly had been diagnosed earlier, prophylactic treatment could have been instituted by anyone of the dentists who had been involved in the previous management of this patient. Dens invaginatus is an anomaly that should be familiar to all practicing dentists because of the clinical implications and potential sequelae. Prophylactic filling of the coronal defects seen in erupted teeth should be done early.

Un erupted teeth diagnosed of this anomaly on radiographs should also benefit from prophylactic filling of the coronal defect once they erupt. This is to prevent caries and its sequelae of pulpitis and periradicular inflammation from being the cause of future extensive and expensive treatment options or loss of the tooth⁽²⁾. In this case, composite restorative material was used for the prophylactic filling (Figure 4). It is hoped that in view of his high caries index, this patient will become motivated by the oral hygiene and caries prevention education given and more importantly, visit the dentist for routine dental checkups.

Conclusion

Dens invaginatus is an anomaly that should be familiar to all practicing dentists because of the clinical implications and potential sequelae. Prophylactic composite resin restoration of the coronal defect of involved teeth is recommended to prevent caries and its complications from being the cause of extensive and expensive treatment options or tooth loss.

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