CASE REPORT

A rare presentation of multiple dens invaginatus in maxillary dentition

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Accepted 8 June 2014

SUMMARY

Dens invaginatus is a developmental disturbance of the tooth and usually occurs in the maxillary lateral incisor of permanent dentition. In this article, a rare case of dens invaginatus affecting multiple permanent maxillary teeth is described.

BACKGROUND

Dens invaginatus is a developmental disturbance of the shape of a tooth and commonly affects permanent maxillary lateral incisors. During the development of a tooth, an infolding of epithelial structure of enamel organ into the dental papilla before initiation of calcification of the crown may result in dens invaginatus.^{1 2} Dens in dente, invaginated odontome, dilated gestant odontome, dilated composite odontome, tooth inclusion and dentinoid in dente are the other names of this anomaly.³ Dens invaginatus shows evident radiopacity in the coronal portion of pulp, or it may extend into radicular pulp in a radiograph. This invagination is usually lined by enamel but also sometimes by dentin or cementum. Radiographic examination differentiates this anomaly from surrounding tooth structure when the radiodensity of dens invaginatus is equal to enamel.^{1 3} Oehlers described dens invaginatus according to the degree of invagination in three forms in 1957.⁴

Type 1: an enamel-lined minor form, which occurs within the crown of the tooth and does not extend beyond the cemento-enamel junction.

Type 2: an enamel-lined form, which invades the root as a blind sac and may communicate with the dental pulp.

Type 3: a severe form, which extends through the root and opens in the apical region without communicating with the pulp.

This anomaly commonly alters the shape of the palatal surface of the incisors by forming a deep lingual pit and so susceptibility to dental caries is increased.⁵

CASE PRESENTATION

A 34-year-old male patient presented to our clinic with bleeding gums. On general examination the patient was well built, well nourished and in good general health. There was no remarkable extraoral finding. Intraorally, the gingiva was inflamed in relation to all teeth. Intraoral examination revealed unique morphological features on palatal surfaces of the permanent right and left maxillary central and lateral incisors. There was presence of two invaginations on the cingulum on the palatal

surface of all four permanent maxillary incisors. So the cingulum was divided into three lobes with two developmental grooves and these lobes were attached with the remaining palatal surface with two lingual pits and a deep developmental groove (figure 1). The labial surface of the permanent right maxillary central incisor showed discolouration (figure 1), but the patient had no associated symptoms in relation to the same tooth. There was a history of trauma to the permanent right maxillary central incisor during childhood but the patient had not undergone any treatment as he was unaware of this condition. Talon's cusp was present on the palatal surface of both right and the left permanent maxillary canines (figure 1).

INVESTIGATIONS

Radiographically, dens invaginatus was present in the permanent maxillary right and left central incisors not extending beyond the cemento-enamel junction, which was suggestive of type 1⁴ (figure 2). There was presence of remarkable radiolucency in the periapical region of the permanent maxillary right central incisor (figure 2), which was extending up to the mesial surface of the apical one-third of root of the permanent maxillary right lateral incisor (figure 3). Type 1 dens invaginatus was also present in the permanent maxillary right and left lateral incisors without any radiographically visible periapical lesions (figures 3 and 4). Radiographs of the right and left permanent maxillary canines confirmed presence of talon's cusp (figure 3 and 4). All teeth were healthy and vital except the permanent maxillary right central incisor which was non-vital when evaluated with thermal tests and confirmed with electric pulp tester (Parkell D624).

DIFFERENTIAL DIAGNOSIS

Gemination should be differentiated from dens invaginatus, as in both the developmental anomalies there is an invagination of enamel organ into dental papilla before calcification starts. Dens invaginatus usually involves the palatal surface of incisors and creates an extra pit on the same surface, while gemination leads to the development of grooves on the labial and lingual aspects of the crown. Radiographic examination can easily differentiate between these two disturbances with the presence of radiopacity within the tooth in dens invaginatus. Clinically, in this case, all the maxillary permanent incisors showed palatal pits with characteristic radiopacity within the crown in radiographs.

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To cite: Purani JM,
Purani HJ. *BMJ Case Rep*
Published online: [please
include Day Month Year]
doi:10.1136/bcr-2013-
200389

Figure 1 Clinical photograph showing dens invaginatus in the permanent maxillary right and left central and lateral incisors.

TREATMENT

Although the patient was asymptomatic he was referred to an endodontist to restore palatal pits with pit and fissure sealant in the maxillary left central incisor and maxillary right and left lateral incisors for prevention of dental caries and for endodontic treatment of the maxillary right central incisor. The procedure of pit and sealant application includes polishing, etching and bonding of the involved tooth surface, followed by application of sealant material.

Access opening of the pulp chamber with dental burs and preparation with Gates Glidden drills are advised in endodontic treatment of a tooth affected by dens invaginatus, to shape the areas of calcification within the pulp canal, and then biomechanical preparation and gutta-percha filling of the pulp canal should be performed.

OUTCOME AND FOLLOW-UP

In this case, restoration of the affected teeth was sufficient to rectify the condition.

DISCUSSION

Apart from maxillary lateral incisors in permanent dentition, maxillary central incisors, premolars, canines and molars can also be affected by dens invaginatus.^{1,3} Very few cases were published with four or more than four dens invaginatus in a single patient in the dental literature. In this case, multiple teeth, right and left maxillary central and lateral incisors, were affected with dens invaginatus, which is quite rare. A similar case was presented by Conklin in which all the maxillary incisors were affected by dens invaginatus in a patient in 1968.⁶ Conklin also

Figure 2 Radiograph showing dens invaginatus in the permanent maxillary right and left central incisors and periapical radiolucency in relation to the permanent maxillary right central incisor.

Figure 3 Radiograph showing dens invaginatus in the permanent maxillary right lateral incisor.

Figure 4 Radiograph showing dens invaginatus in the permanent maxillary left lateral incisor.

found dens invaginatus in all four mandibular incisors in another patient in 1978.⁷ In 1980, Burton *et al*⁸ found the same anomaly in all the maxillary incisors and canines. Sedano *et al*⁹ presented a case of multiple dens invaginatus involving all permanent mandibular incisors and maxillary left central incisor in 2009.

Learning points

- ▶ Dens invaginatus can be present in multiple teeth.
- ▶ When abnormal pits or grooves are present on the palatal surfaces of incisors, radiography should be performed to rule out the presence of dens invaginatus.
- ▶ Diagnosis of dens invaginatus is important as it increases susceptibility to dental caries.

Contributors JMP and HJP contributed in collection of data (ie, diagnosis, images, radiographs, review of similar other cases) and drafted the manuscript of this case report.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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