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Radicular dens invaginatus associated with radicular cyst in maxillary third molar – Rare case report

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ABSTRACT

Dens invaginatus is a developmental tooth anomaly showing broad spectrum of morphological variations. Most extreme form of the invagination results in a bulbous expansion of the affected crown and/or root has been termed as dilated odontome. Radicular dens invaginatus is a rare dental anomaly formed by infolding of Hertwig's epithelial root sheath and in few forms invagination is lined by enamel. Various techniques of treatment including conservative treatment, nonsurgical root canal treatment, and endodontic surgery usually are unsuccessful because of their complex morphology and are associated with periapical lesions. We report a case of radicular dens in dente with dilated root and was associated with radicular cyst in the right maxillary third molar in a patient aged 38 years. Histological examination showed a dilated bulbous root with enamel formation within root invagination and the associated radicular cyst was lined by pseudostratified ciliated columnar epithelium.

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1. Introduction

Dens invaginatus is also termed as “Dens in dente”, “dilated composite odontome”, “dents telescopes”, and “gestant odontome”. The most severe form of the dilated type of dens invaginatus is called a dilated odontoma. The frequency of occurrence is 0.04–10% and most commonly affected teeth are maxillary lateral incisors followed by central incisors, premolars, canines, and molars. The mandibular occurrence is rare and bilateral occurrence is not uncommon. There is no

specific sex predilection but the condition exhibits a high degree of inheritability.^{1–3}

Two variations of Dens Invaginatus are described – a coronal type and a radicular type. The coronal type is caused by invagination of all layers of the enamel organ into the dental papilla. Oehlers described dens invaginatus as occurring in three forms depending on the extension of enamel lined cavity, Type I – minor form occurring within the confines of the crown of the tooth and not extending beyond the amelocemental junction, Type II – which invades the roots but remains within its confines and Type III – severe form which

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penetrates through the root and shows a second foramen in the apical or periodontal area.^{4–6}

The radicular type of Dens Invaginatus occurs due to infolding of Hertwig's sheath into the developing root. There are two distinct types of radicular dens invaginatus – first type shows cementum lined invagination and second type regarded as true form is represented as enamel lined invagination within root.^{4,7} Very few cases of radicular dens invaginatus are reported and due to their complex morphology pulpal necrosis, apical lesions are often associated.^{8,9} The radicular cyst or periapical cyst are usually lined by stratified squamous epithelium, however rarely they have been found to be lined partially or predominantly by ciliated columnar epithelium or muco-secretory cells.^{10,11} Here we present a rare case report of radicular dens invaginatus with dilated root in right maxillary third molar which was associated with radicular cyst.

2. Case report

A 38-year-old male patient reported to the Institution, with severe continuous pain in the region of upper right third molar area since 3 months which increased in severity in last 3 days. The patient reported that one year back, he got restoration for the same in a private dental hospital. The patient was in good general health and revealed no significant extra oral findings. Intraoral examination revealed improperly done crown on 18 which was sensitive to palpation and percussion. No soft tissue findings were evident except for tenderness on palpation in periapical area in the region of 18. Periapical radiograph showed an abnormal 18 with a bulbous root with an apical crescent shaped invagination associated with periapical radiolucency. The periapical radiolucency measured approximately 1×2 mm with ill defined border. A clinical diagnosis of dens invaginatus with apical periodontitis was given.

A complete blood and urine analysis was done and all indices were found within normal limits. The tooth was extracted under local anesthesia after reflection of the muco-periosteal flap and was sent for histopathological examination. Morphological features revealed an abnormal tooth with improperly prepared crown and an enlarged bulbous dilated root with periapical soft tissue. The tooth measured 2 cm occluso-apically and 1.5 cm mesio-distally at the highest circumference near bulbous root with an abnormal crown to root proportion (Figs. 1 and 2). The soft tissue attached to the tooth and soft tissue enclosed within the dilated root was removed and sent for histopathological examination. The tooth was sectioned into two halves which showed an invagination near root apex extending towards pulp chamber. The inner surface of the invagination was irregular and was lined by white area morphologically resembling enamel (Fig. 3). One half was made into ground section which showed a well formed coronal enamel, dentin but the pulp chamber was crescent shaped with irregular pulpal canals. The radicular portion showed disorderly arrangement of dentin, enamel and inter radicular cementum but all the structures were well formed. The enamel was present between the root dentin and cementum within invagination. This radicular enamel was well-formed with enamel rod structure (Figs. 4 and 5). The developmental anomaly was diagnosed as true form of



Fig. 1 – Gross specimen of extracted dilated dens invaginatus showing abnormal morphology of root with periapical soft tissue.

radicular dens invaginatus with severe malformation resembling dilated odontoma. The soft tissue pathology revealed cystic space predominantly lined by pseudostratified ciliated columnar epithelium with plenty of mucous cells, clear vacuolated cells. The underlying connective tissue capsule was delicate, edematous with foam cells, mast cells, inflammatory cells, blood vessels; extravasated RBC's suggesting it to be radicular cyst with mucous metaplasia (Fig. 6).

3. Discussion

Dens invaginatus is a variation in the development of a tooth, which is thought to occur when there is an infolding of the surface of the crown before calcification has begun. Radicular dens invaginatus is a rare dental anomaly with bizarre radiographic appearance. Very few cases with enamel lined invagination within root and a rare form with inter-radicular crown have been reported.^{9,12,13}

Radicular variety is further distinguished into two types, the first type originally described by Cohen who suggested the



Fig. 2 – Gross specimen showing the abnormal proportion of root to crown.

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