Dilated Odontome as a "Smiling" Mandibular Third Molar: A Case Report

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Abstract

Dens Invaginatus (DI) is a developmental dental malformation presenting with different morphological variations, resulting in a deepening or invagination of the enamel organ into the dental papilla prior to calcification of the dental tissues. The most severe variety of dens invaginatus is called dilated odontome. Here we present an extremely rare case of a dilated odontome arising in the mandibular third molar of a 24 year old male patient and to give an insight of the clinical, histological and radiological features.

Key Words : Dens Invaginatus, Dilated Odontome, Mandibular third Molar

Introduction

Dens Invaginatus (DI) is a developmental dental malformation presenting different morphological variations, resulting in a deepening or invagination of the enamel organ into the dental papilla prior to calcification of the dental tissues.[1,5] DI in human tooth was described by a dentist named Socrates in 1856.[2,6] Dens invaginatus was first described by 'Ploquet' in 1794 in a Whale's tooth and then by Salter in 1855 as "a tooth within a tooth.[4]" This condition has been described with a plethora of terminologies; such as Busch in 1897 suggested the term "Dens in Dente" which is derived from the radiographic appearance of "tooth within a tooth." Hunter proposed the term "dilated composite odontome.[7,9]" The term "Dens Invaginatus" first suggested by Hallet, implies the infolding of the outer portion (enamel) into the inner portion (dentin) with the formation of a pocket and dead spaces, therefore appearing as the most appropriate terminology[2]. The different theories suggesting the aetiology of the malformation are growth pressure of dental arch resulting in buckling of enamel organ, focal failure of growth of internal enamel epithelium, rapid and aggressive proliferation of a part of internal enamel epithelium invading the dental papilla, infection, trauma and genetic factors[7,10-14].

The reported prevalence of DI is .25% to 10%. The teeth mostly affected are the maxillary lateral incisors followed by maxillary central incisors, premolars, canines and molars. The most severe variety of dens invaginatus is called a dilated odontome. Dilated odontome demonstrates an inverted hard tissue structure due to severe invagination, often accompanied with central soft tissue or hard tissue. A dilated odontome in the mandibular molar region is a rarity.[1,3,4,15,16]

A pubmed search with the key words dilated

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odontome and mandibular third molar revealed only one case report till date. Here we present an extremely rare case of a dilated odontome arising in the mandibular third molar of a 24 year old male patient, to give an insight of the clinical, histological and radiological features.

Case Report

A 24-year-old male patient reported to the department of Oral Medicine and Radiology, for the extraction of lower right back tooth, quite often associated with recurrent previous episodes of pain and swelling over right side of face since last 1 year. The general and extra-oral examinations were non contributory. Intraorally, mandibular right permanent first molar was missing; mandibular right second molar was endodontically treated, while the mandibular right third molar was found partially erupted. Periapical radiograph of the mandibular right third molar region as well as a panoramic radiograph revealed a bulbous third molar with severely deformed roots (Fig.1, 2, 3).Varied densities were found within the tooth. Internally the tooth showed severe invagination of enamel extending upto the apical third, therefore enlarging the roots and giving it a “smiling frog” appearance. The radiolucent mouth of the frog marked the recess while the smile creases the pulpal chambers. Therefore, provisional diagnosis of a dilated odontome was made.

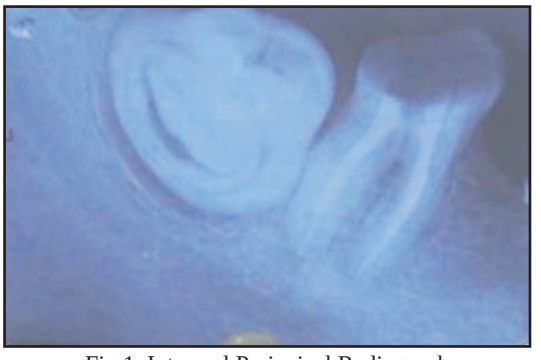

Fig.1. Intraoral Periapical Radiograph of mandibular right third molar

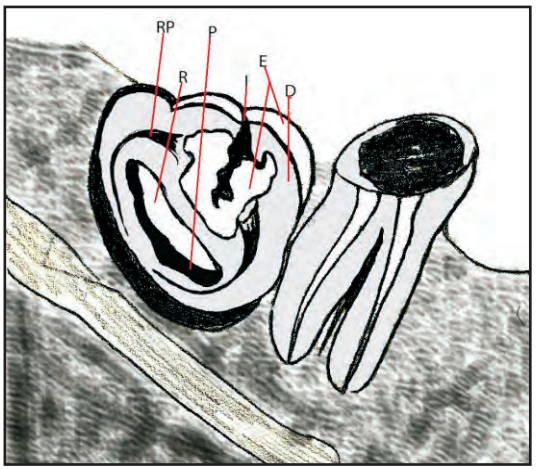

Fig.2.Diagramatic illustration of the radiographic presentation of the dilated odontome (E: Enamel; D: Dentine; P: Pulp; I: Invagination; R: Recess; RP: Radicular pulp)

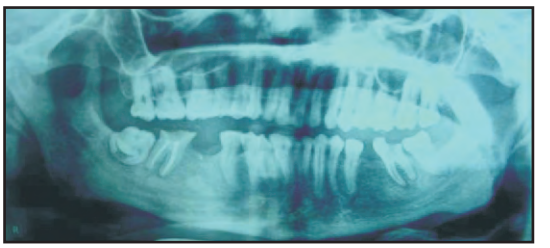

Fig.3. Panoramic Radiograph showing morphological variant of mandibular right third molar

The extraction of the mandibular right third molar was planned and the extracted tooth (Fig.4) underwent a histological examination. The ground section of tooth revealed a typical "tooth-within-a-tooth" appearance. Microscopically mineralized structure similar to dentine and cementum and non mineralized pulp in a haphazard or irregular manner could be appreciated. (Fig.5). Thereafter a diagnosis of a dilated odontome was made.

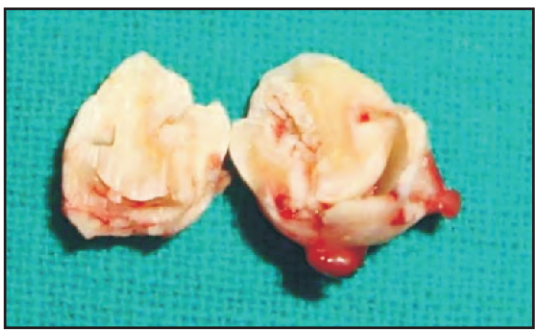

Fig.4. Typical “tooth-within-a-tooth appearance

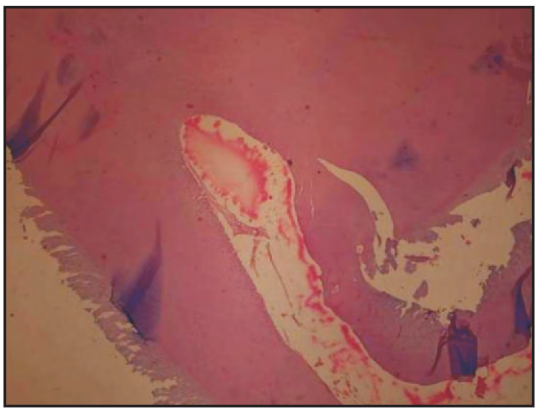

Fig.5. Microscopic histological findings.

Discussion

A dilated odontome has been described as a developmental dental anomaly in which the tooth has an oval or circular shape with a radiolucent interior having central soft tissue mass. Rushton coined the term "dilated composite odontome" and suggested that the main point of differentiation between dens invaginatus and DI is the time when the disturbance occurs. Dens invaginatus occurs later in odontogenesis and thus forms a recognizable tooth unlike Dilated odontome which originates during the morphodifferentiation stage of tooth development.[17] The precise etiopathogenesis is still unknown but the proposed theories include ingrowth of enamel organ into dental papilla, focal growth retardation, focal growth stimulation,localized external pressure in certain areas of the tooth bud, trauma, infection and genetic.[18,19]

Thomas conducted a radiological study and reported an incidence of 7.74%[20]. The dilated odontome reported in this case report was discovered while taking an intraoral periapical radiograph of a partially erupted third molar.

Dilated odontome in the third molar region is very rare but some cases have been reported as compound or complex odontoma[1]. Crincoli et al reported a case presenting with a pumpkin-like morphology with a C shaped pulpul cavity in the second molar region of the maxilla[5]. Joubert et al. reported a case of a dilated odontoma in the third molar of the mandible with a bizarre malformation in the crown and upper half of the root presenting characterestics of a complex odontoma whereas the lower half of the root was normally formed.[21] The radiographic appearance of the bulbous mandibular right third molar was that of a smiling frog in this case.

The differential diagnosis that was considered is a complex odontoma. Complex odontomas present as an amorphous conglomerations of enamel and dentine with a predilection for posterior mandible. It presents as a well-defined radiopacity surrounded by a radiolucent rim, often associated with an unerupted tooth. It is usually irregular in shape, only the dilated varieties are usually corticated and well defined with round or oval masses with radiolucent centers. The treatment modalities recommended for an invagination are:

- Prophylactic or preventive sealing of the invagination
- Root canal treatment
- Endodontic apical surgery
- Intentional replantation
- Extraction[7]

In this case, an extraction of dilated odontome was performed as it was impacted.

Conclusion

Dens invaginatus is not an uncommon condition but is easily overlooked as it does not present with any significant clinical signs. Invagination is considered to increase the risk of caries, pulpal involvement and periodontal

conditions therefore reiterating the need to acknowledge and treat the anamoly with appropriate modality.[22]

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