

Dentigerous Cyst Associated with Impacted Canine and An Adjunct Dens in Dente: A Case Report

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ABSTRACT

Background: A dentigerous cyst is an odontogenic cyst associated with the crown of the impacted or unerupted teeth. They can grow extremely large and remain undetected until they enlarge enough, causing bony expansion and asymptomatic facial swelling. Such a cyst remains initially completely asymptomatic unless when infected and can be discovered only on routine radiographic examination. We present a challenging case of dentigerous cyst in a 11-year-old female child involving the left maxillary impacted canine. Diagnosis was very doubtful as the situation was complexed by dens in dente with left maxillary central incisor. Finally, CBCT led us to the final diagnosis of dentigerous cyst with impacted canine and enucleation of cyst was performed.

Keywords: Dentigerous cyst, impacted canine, dens in dente, enucleation.

INTRODUCTION

In general, cysts of the jaw commonly present as swellings of the jaws and the mid face. The frequency of dentigerous cyst formation has been calculated as 1.44 in every 100 unerupted teeth.^{1,2} The dentigerous cyst is the second most common cyst of the jaws comprising 14–20 per cent of all jaw cysts, and they are more frequent in males and more common in the mandible.³ Dentigerous cysts usually present in the second or third decade of life and are rarely seen in childhood. However, according to some authors, most patients with a dentigerous cyst are younger than 20 years⁴. The age range for reported cases varies widely, from 4 years to 57 years of age. This lesion is attached to the cervix of an impacted tooth and results from proliferation of reduced enamel epithelium after the enamel formation. Dentigerous cysts are usually discovered on routine radiographic examination or

when films are taken to determine the reason for failure of a tooth to erupt.⁵

A dentigerous cyst or follicular cyst is an odontogenic cyst thought to be of developmental origin associated with the crown of an unerupted (or partially erupted) tooth. The usual radiographic appearance is that of a well demarcated radiolucent lesion attached at an acute angle to the cervical area of an unerupted tooth. The border of the lesion may be radiopaque. They are usually unilocular, although large lesions occasionally show a scalloping multilocular pattern. The radiographic differentiation between a dentigerous cyst and a normal dental follicle is based merely on size. Radiographically, a dentigerous cyst should always be differentiated from a normal dental follicle. Dentigerous cysts are the most common cysts with this radiographic appearance.⁶ The differential diagnosis of a dentigerous cyst includes other odontogenic cysts, such as radicular cysts,

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Fig 1: Preoperative maxillary occlusal view.

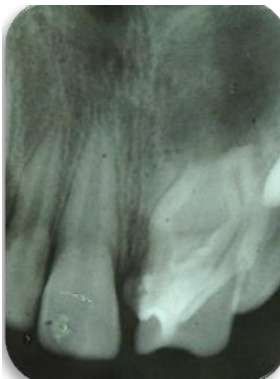


Fig 2: Preoperative IOPA.



Fig 3: Preoperative orthopantomogram.

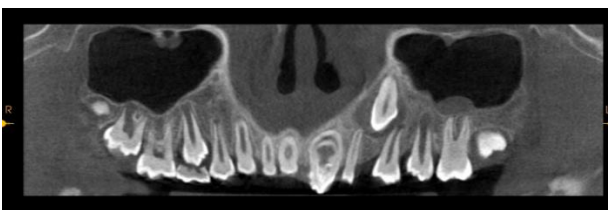


Fig 4: Preoperative coronally sectioned image of CBCT.

odontogenic keratocysts, and odontogenic tumors, such as ameloblastoma, Pindborg tumor, odontoma, odontogenic fibroma, and cementomas. However, mucocles, retention cysts, and pseudocysts are also included in the differential diagnosis when a

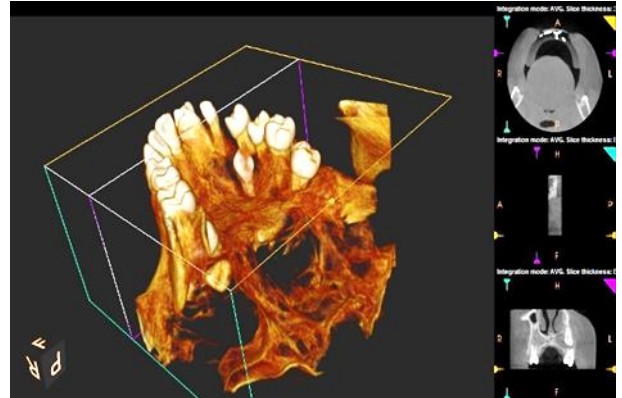


Fig 5a & b: Preoperative images from CBCT.

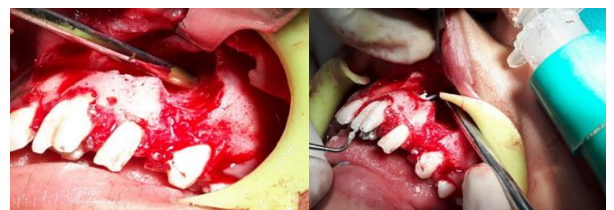
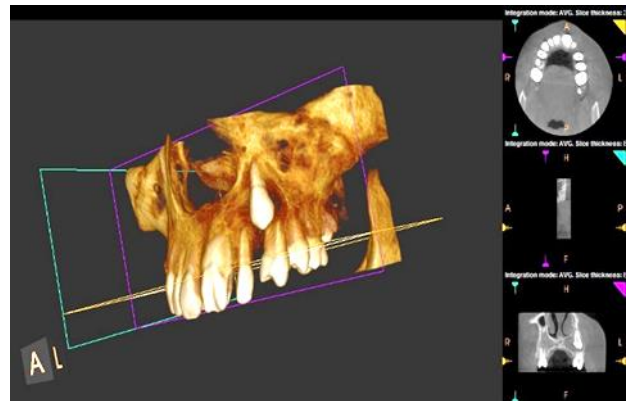


Fig 6: Intraoperative images a) endodontic treatment of 21 b) After extraction of 23.



Fig 7: Post operative OPG.

maxillary sinus cyst is visualized involving maxillary expansion.⁷ The standard treatment for a dentigerous cyst is enucleation and extraction of the cyst-associated impacted or unerupted tooth.⁸

Dentigerous cysts of the maxillary sinus, and the impacted tooth within, are often easily removed via a Caldwell-Luc procedure.⁹ In large cysts, an initial marsupialization to diminish the size of the osseous defect, followed by enucleation and tooth extraction, has been advocated.

Dens in dente is a developmental anomaly resulting from the invaginations of the enamel organ into the dental papilla during the soft tissue stage of development. As the hard tissues are formed, the invaginated enamel organ produces a small tooth within the future pulp chamber.¹⁰

CASE REPORT

A 11-year-old girl reported to the department of Pedodontics and Preventive Dentistry, NHDCRI Sakri, Bilaspur with the chief complaint of pain in upper anterior region for 15 days. On examination the left central incisor was present with congenital malformation which was diagnosed to be dens in dente. Left central incisor was tender on percussion. Also, there was vestibular tenderness with pain on palpation in canine fossa region. There was history of extraction 6 months back with her deciduous left canine due to swelling and pus discharge with the same. On radiographic examination of IOPA radiograph and maxillary occlusal view a well-defined radiolucency was appreciated surrounding the impacted permanent left maxillary canine. Fine needle aspiration cytology revealed a blood mixed aspirate which on microscopic examination showed cells discrete in pattern which are mostly lymphocytes, macrophages and plasma cells with hemorrhagic background giving an impression of chronic inflammatory lesion. CBCT also revealed a well defined cystic lesion surrounding a impacted canine.

Based on the investigations, a diagnosis of dentigerous cyst associated with unerupted 23 and irreversible pulpitis with 21 (dens in dente) was made. Treatment planning include complete oral prophylaxis followed by enucleation of dentigerous cyst and endodontic treatment of maxillary left central incisor. Intentional RCT was done with 22 prior to procedure. Routine laboratory investigations were carried out and necessary premedication and general anesthesia was administered. Enucleation of the cyst was performed by Cad Well Luc approach. A semilunar

incision was made 5 mm above the gingival margin over canine fossa. After flap reflection thin bony covering was removed with the help of rongeur. At the time of surgery, the cystic line was judged to be thick and remnants of lining associated with the impacted tooth may again give rise to lesion was anticipated. Hence, extraction of the impacted canine was also done. 21 was endodontically treated at the same time.

DISCUSSION

Dentigerous cyst is one that encloses the crown of an unerupted tooth by expansion of the follicle and is attached to its neck. The term dentigerous is preferred, the literal meaning being "tooth bearing." Dentigerous cyst is associated with an unerupted tooth.⁶ In order of its frequency, they are associated mandibular third molars, maxillary canines, mandibular second premolars and maxillary third molars. They may also occur around supernumerary teeth, however, they are only rarely associated with primary teeth⁶ and our case was related with permanent maxillary canine.

Regarding its pathogenesis, it has been suggested that the pressure exerted by an erupting tooth on the follicle may obstruct venous flow inducing accumulation of exudate between the reduced enamel epithelium and the tooth crown. In addition to the developmental origin, some authors have suggested that periapical inflammation of nonvital deciduous teeth in proximity to the follicles of unerupted permanent successors may be a factor for triggering this type of cyst formation.¹¹ As the literature suggests that periapical inflammation of nonvital deciduous teeth in proximity to the follicles of unerupted permanent successors may be a factor for triggering this type of cyst formation, this could be the possible reason for development of cystic lesion in this case.

For radiographic examination, water's view, panoramic radiography and plain skull radiography are simple and inexpensive methods that can be used in daily practice. The structure of a tooth can be clearly detected on panoramic radiographs. Therefore, panoramic radiographs are preferred over CT. However, Freedland and Henneman reported that when a mass is identified within the maxillary sinus, more than one film is necessary to determine the exact position of the lesion. CT scans

provide superior bony detail, allowing for the visualization of the size and extent of the lesion with determination of orbital or nasal invasion or involvement.¹² Therefore, CT may be more valuable than plain film radiographs, not only for definitive diagnosis, but also for evaluation of the associated pathology, exact localization of the ectopic tooth, and proper treatment planning.¹³

Histologically dentigerous cysts are lined by a layer of nonkeratinized stratified squamous epithelium, with a surrounding wall of thin connective tissue containing odontogenic epithelial rests. Since the dentigerous cyst develops from follicular epithelium it has more potential for growth, differentiation and degeneration than a radicular cyst. Odontogenic tumors, such as ameloblastoma or epidermoid carcinomas, occasionally arise from the lining of the dentigerous cyst. In the literature, no reported metaplastic and dysplastic changes arise from dentigerous cysts in the maxillary sinus associated with a displaced tooth.⁸ Due to the tendency for dentigerous cysts to expand rapidly, they may cause pathological fractures of jaw bones.

Marsupialization is the favored treatment of dentigerous cyst⁵ but enucleation of the cyst was chosen as the treatment of choice as the patient's guardians were not ready for a prolonged treatment period. The extensive involvement of canine and thickened cystic lining on opening of the cavity propelled for extraction of 23. Treatment of a dentigerous cyst depends on size, location, and disfigurement and often requires variable bone removal to ensure a total removal of the cyst. Even though marsupialization of the cyst is the treatment of choice for dentigerous cyst in children in order to give a chance to the unerupted tooth to erupt, the major disadvantage of marsupialization is that pathologic tissue is left *in situ*, without a thorough histologic examination. Although the tissue taken from the window created can be submitted for pathologic examination, there is a possibility of a more aggressive lesion in the residual tissue.

According to classification proposed by Oehlers (1957) it was class III dens in dente, a form which penetrates through the root perforating at the apical area showing a second foramen in the apical or in the periodontal area and there is no immediate communication with the pulp. The invagination may

be completely lined by enamel, but frequently cementum will be found lining the invagination.¹⁰ Root canal treatment of teeth with complex root canal anatomy such as dens in dente can be problematic because infected pulpal tissues may remain in inaccessible areas of the canal system. The cleaning and debridement of such root canal systems are therefore challenging. An immature apical root end development is another challenge in root canal treatment especially in controlling the apical extent of the filling material and achieving an apical seal. In this case, retrograde MTA placement followed by GP obturation with 21 was done during the operative procedure because of blunderbuss opening of 21.

CONCLUSION

In summary, dentigerous cyst development associated with unerupted permanent tooth is not uncommon. Dentigerous cyst of maxilla are usually associated with maxillary third molar and not with canine tooth. The extensive involvement of canine and thick cystic lining associated with it led us to perform enucleation with extraction of 23 in 11-year-old female child. Also, the dens in dente was endodontically treated. These findings are uncommon and hence, the case is reported.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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