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CASE REPORT

DENTIGEROUS CYST ASSOCIATED WITH IMPACTED PERMANENT MAXILLARY CANINE: A CASE REPORT

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ABSTRACT

Dentigerous or follicular cysts are the most routinely encountered developmental cysts manifesting in the jaws, frequently seen in association with mandibular third molars and maxillary canines, which are commonly encountered impacted teeth. Herein, we report a case of dentigerous cyst emanating in a 10 year old male with an impacted maxillary canine, clinically presenting as a unilateral swelling in the middle third of the face. The patient was treated with surgical enucleation of the cyst along with extraction of the involved tooth under local anesthesia. Histopathology affirmed the diagnosis of dentigerous cyst in relation to the impacted canine. Recovery was full with no post-operative complications.

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INTRODUCTION

Odontogenic cysts are the most common form of cystic lesions emerging in the maxillofacial area owing to the many rests of odontogenic epithelium remaining in the tissues. These are conventionally categorized on the basis of their origin into a developmental group, comprising of dentigerous cysts and keratocysts and an inflammatory group involving radicular cysts. Ordinarily asymptomatic, the developmental cysts do have the potential to develop into extremely large lesions, leading to cortical bone expansion and erosion. On the other hand a few cysts may acquire an aggressive course bringing about jaw destruction and frequent recurrence.¹

Amongst the developmental cysts, DC are the most common entities, frequently in association with embedded unerupted teeth. Impacted mandibular third molars and maxillary canines are the predominant perpetrators.² However, occasional occurrence with supernumerary teeth and mesiodens has also been reported. Like other cysts, uncomplicated dentigerous cysts cause no symptoms until the swelling becomes evident. Alternatively a dentigerous cyst may be an incidental radiographic finding when the cause is sought for a missing tooth.^{1,2}

The indicated treatment includes enucleation of the cyst along with extraction of the offending impacted tooth or decompression to salvage the involved tooth.³

The following is a case report of dentigerous cyst (subject consent obtained) occurring in a male patient of 10 years. This case is reported because of its unusual presentation, aggression, and occurrence at this age.

Case Report

A 10 year old boy reported with a chief complaint of swelling on the left side of the face since one month which gradually progressed to attain its current size. The patient also complained of pain in the upper left front tooth region. Medical and family histories were not significant.

A bony hard swelling was evident in the left cheek region on extra-oral examination. (Fig.1) on intra-oral examination a hard swelling extending from 63 to 65 was discernible. There was grade II mobility in relation to 63. (Fig.2) A panoramic radiograph revealed a unilocular radiolucency in respect to the left maxillary deciduous canine, having precise sclerotic margins, in association with impacted permanent maxillary canine. The radiolucency extended anteriorly from the distal border of 22 and posteriorly till the unerupted permanent maxillary first premolar. There was displacement of left lateral incisor. Radicular resorption in the middle third of the root of

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maxillary lateral incisor was also evident (Fig.3). Routine laboratory parameters were normal. Fine needle aspiration was performed and the 2 ml of straw colored fluid aspirated from the lesion was concluded to be an inflammatory exudates.



Figure 1 1A- Extraoral view, 1B- Enucleated cyst en masse along with the impacted canine



Figure 2 Orthopantomograph revealing unilocular well defined radiolucency surrounding impacted permanent left maxillary canine.

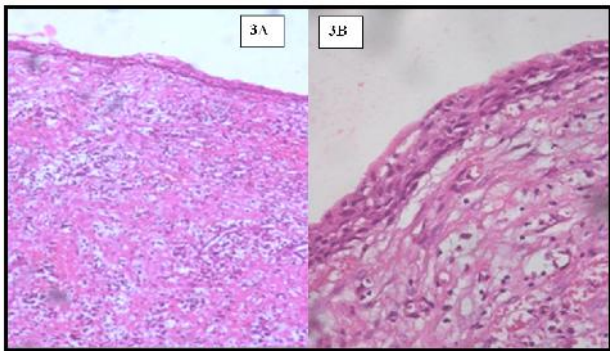


Figure 3 3A- Photomicrograph showing a cystic cavity, lined by nonkeratinized, stratified squamous epithelium. (4X) 3B- Photomicrograph showing a cystic cavity, lined by two to three cell layer thick (arrow) non-keratinized, stratified squamous epithelium, resembling reduced enamel epithelium. (40X)

Based on the patient's history and results of the clinical and radiographical examination, the lesion was provisionally diagnosed as dentigerous cyst and a surgical enucleation with removal of the offending tooth was performed under local anesthesia. The specimens were then sent for histopathological evaluation. The submitted specimens consisted of cyst en masse measuring approx 12mm x 13mm x 4mm with the cystic cavity enclosing the permanent maxillary canine. (Fig.4)



Figure 4 post-operative views showing complete resolution of The lesion

Histopathology revealed a cystic cavity lined by a thin non keratinized stratified squamous epithelium of 2-4 cell layer thickness with no rete pegs, simulating reduced enamel epithelium. The underlying connective tissue stroma was fibrocellular, showing loose collagen fibre bundles and diffuse chronic inflammatory cell infiltrate chiefly comprising of lymphocytes, plasma cells and macrophages. The cystic lumen showed extravasated RBCs. (Fig.5)

Histopathology certified the diagnosis of dentigerous cyst relative to impacted maxillary canine. There were no intra-operative complications and the patient was followed up for six months without any complexity in the post-operative period. (Fig. 6)

DISCUSSION

The word "dentigerous" implies "bearing teeth" and thus dentigerous cyst is described as a cyst that arises as a result of isolation of the follicle encompassing the crown of an unerupted tooth and is affixed at cemento-enamel junction. These are the most routinely encountered developmental cysts. Largely found solitarily, these cysts can be multiple in syndromic conditions such as like mucopolysaccharidosis (type VI), cleidocranial dysplasia, Maroteaux-Lamy syndrome and basal cell nevus syndrome.⁴

Our case concerned a 10 year old boy; however, dentigerous cysts have a peak occurrence in the second decade, commonly arising in individuals between 10 to 30 years of age. These cysts have a predilection for the male population with an incidence rate of 1.6:1.⁴

The posterior mandibular region is a common site of occurrence for this lesion, followed by the anterior maxilla. As dentigerous cysts are in found in relation to the crowns of unerupted teeth, the most frequently encountered teeth are impacted mandibular third molars followed by maxillary canines, mandibular second premolars and maxillary third molars and are only rarely found in association with primary teeth.^{4,5}

Several dentigerous cysts go undetected until encountered by chance in routine radiograph as they do not exhibit any

symptoms. However, some cysts may attain a substantial size bringing about painless bony expansion until infected secondarily. In view of these lesions acquiring extensive size without manifestation of any symptoms, it is essential to detect and remove them to minimize destruction.⁶

Radio graphically, it is identified as a distinct unilocular radiolucency with a sclerotic border, but an infected cyst may show ill-defined borders. Sizable dentigerous cysts may however appear as multilocular lesions due to the presence of bone trabeculae within the radiolucency. Based on radiography, these cysts are of 3 types. In the *central variety*, which is the most frequently encountered, the cyst encircles the crown of the tooth with the crown protruding in the cystic lumen. The *lateral variety* is most commonly found in association with mesioangular impacted mandibular third molars that are partially erupted. The cyst grows parallel to the root surface and partly encircles the crown. In the *circumferential* variant, the cyst envelops the crown and continues for some distance along the root exterior so that a significant portion of the root appears to lie within the cyst.^{5, 6} The radiographic characteristics of the present case were typical of the circumferential variant.

Relying primarily on whether or not the cyst is inflamed, the histopathological aspect may show variations. When non-inflamed, a loosened fibrous connective tissue wall along with a fragile epithelial lining is present. A derivative of the REE, the epithelial lining is 2-4 cell layers thick and the cells are cuboidal or low columnar. Rete-ridges are lacking, apart from those cysts which get secondarily infected. In consideration of the fact that the supporting connective tissue wall of the cyst is derived from the dental follicle of a maturing enamel organ, it is abundant in acid mucopolysaccharides.^{7, 8} In inflamed dentigerous cysts, the epithelial lining may show changeable amount of hyperplasia with formation of rete pegs and the connective tissue wall is thicker with infiltration of chronic inflammatory cells. Focal distribution of mucous cells may be evident in the epithelial lining of dentigerous cysts, and rarely ciliated columnar cells are also present with occasional occurrence of sebaceous glands in the connective tissue wall. These mucous, ciliated, and sebaceous components are believed to be the result of metaplasia, illustrating the multipotentiality of the odontogenic epithelial lining in a dentigerous cyst. The cystic lumen often contains a thin runny fluid with a yellowish hue that is seldom blood tinged.^{4, 5, 6}

It has been suggested that DC may have either an intrafollicular or extrafollicular origin. However, as the evidence pointed out, those cysts believed to be originating extrafollicularly were indeed envelopmental or follicular odontogenic keratocysts; there are no takers for this theory. The intrafollicular theory postulates, that collection of fluid in between the REE and the enamel, or amidst the layers of REE gives rise to the dentigerous cyst around an unerupted tooth. As stated by *Main's hypothesis* the affected tooth applies pressure on the follicle, thus resulting in inhibition of venous effusion. This further leads to rapid transudation of serum beyond the walls of capillaries. The heightened hydrostatic pressure enforced by this pooling of fluid detaches the crown from the follicle alongside or without REE. Raised permissibility to glycosaminoglycans such as hyaluronic acid, heparin and

chondroitin sulphate leads to rapid expansile growth of the lesion.⁹ Management of DC involves careful enucleation of the cyst together with removal of the unerupted tooth. The emphasis should be on conservative approach to surgical treatment, in order to retain the involved teeth. The Patients might require orthodontic treatment to assist in eruption. Extensive dentigerous cysts can also be dealt with an initial marsupialization to reduce the size of the bony defect. The cyst can then be excised at a later date, with a less extensive surgical procedure.¹⁰

The prognosis for most dentigerous cysts is finest with rare chances of recurrence. However, the histopathology must be carefully evaluated to rule out transformation into an ameloblastoma or progression to squamous cell carcinoma.^{9, 10}

CONCLUSION

The jaws are host to a vast array of cysts and neoplasms, largely on account of tissues involved in tooth formation. Dentigerous cysts are usually asymptomatic and this delays the diagnosis. Therefore, prompt diagnosis and treatment is essential to avoid complications. A combination of clinical, radiographical, and histopathological examination is necessary for attaining the final diagnosis.

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