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EXPLORING DENTIGEROUS CYST- A REVIEW

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ABSTRACT A dentigerous cyst is one which encloses the crown of an un-erupted tooth by expansion of its follicle, and is attached to the neck. It is an epithelial lined cavity that forms in the follicular space of non erupting tooth after crown formation is complete. The present article presents a review on dentigerous cyst, its pathogenesis, clinical features, histological features, diagnosis and management.

KEYWORDS : Cyst, un-erupted tooth, follicular space, fluid.

Introduction:

Odontogenic cysts are the most frequent type of cystic lesions growing in the maxillofacial area mainly due to the rests of odontogenic epithelium residual in the tissues. These are typically classified on the basis of their origin into a developmental group, comprising of dentigerous cysts and keratocysts and an inflam matory group involving radicular cysts. They are usually asympto matic, but the developmental cysts have the possibility of expanding into extremely large lesions, leading to cortical bone expansion and erosion. Some cysts may become aggressive leading to jaw destruction and frequent recurrence.[1]

The dentigerous cyst is defined as a cyst that originates by the separation of the follicle from around the crown of an unerupted tooth. It is the most common type of developmental odontogenic cyst enclosing the crown of an unerupted tooth and is attached to the tooth at the cementoenarnel junction making up about 20% of all epithelium-lined cysts of the jaws.[2] The aim of this review is to provide a current sketch in knowing and considering of the pathogenesis, clinical features, radiological features, histological features and complications of dentigerous cyst.

Incidence : Dentigerous cyst comprises of 20% of all jaw cysts. About 10% of impacted teeth have formed a dentigerous cyst. The frequency in the general population has been estimated at 1.44 cyst for every 100 unerupted teeth. The dentigerous cyst is nearly associated or is involved with the crown of a normal permanent tooth. It is rarely associated with deciduous tooth.[3]

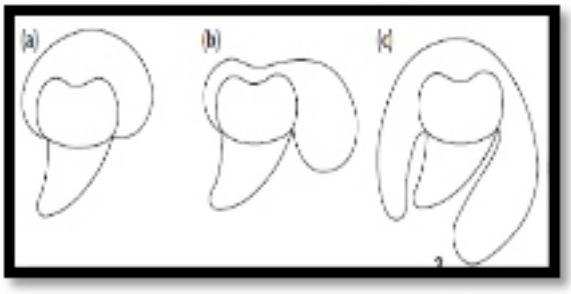
Etiology And Pathogenesis : A dentigerous cyst develops from proliferation of the enamel organ remnant or reduced enamel epithelium. As with other cysts, expansion of the dentigerous cyst is related to epithelial proliferation, release of bone-resorbing factors, and an increase in cyst fluid osmolality.[4]

There are two leading theories about the formation of dentigerous cysts. The first begins with fluid accumulation between the reduced enamel epithelium and the crown of the tooth. The fluid pressure incites a proliferation of the reduced enamel epithelium into a cyst, which is attached at the cementoenamel junction and includes the tooth crown as one of its boundaries. The other theory begins with a breakdown of the stellate reticulum, which forms a fluid between the inner and outer enamel epithelium. The fluid's pressure incites a proliferation of the outer enamel epithelium, which remains attached to the tooth at the cementoenamel junction; the inner enamel epithelium is then pressed onto the crown surface. In each theory, the fluid generates the cystic proliferation by its hyperosmolar content created by cellular breakdown and cell products, causing an osmotic gradient to pump fluid into the cyst lumen.[5]

Clinical Features : Dentigerous cysts may involve impacted, unerupted permanent teeth, supernumerary teeth, odontomas, and rarely, deciduous teeth. They most commonly involve the mandibular third molars or the maxillary canine, followed by the mandibular premolars. The involvement of incisors and supern umerary teeth are rare.[6] They are frequently discovered when radiographs are taken to investigate a failure of tooth eruption, a missing tooth or malalignment. There is usually no pain or discomfort associated with the cyst unless it becomes secondarily infected.[7]

Cystic involvement of an unerupted mandibular third molar may result in a 'hollowing-out' of the entire ramus extending up to the coronoid process and condyle as well as in expansion of the cortical plate due to the pressure exerted by the lesion.[3] Bilateral dentig erous cysts usually occur in association with syndromes like mucopolysaccharidosis (type VI) and cleidocranial dysplasia. Both diseases cause alterations in tooth development or in their eruption. These conditions may participate in the development of multiple dentigerous cysts.[8]

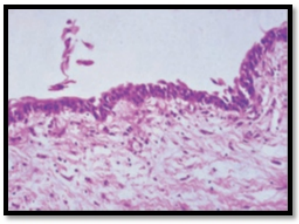
Radiological Features : Radiographs of dentigerous cysts usually show unilocular radiolucent areas associated with the crowns of unerupted teeth having well-defined sclerotic margins unless they become infected. Three types radiological variations of the dentigerous cyst may be observed. In the central variety the crown is enveloped symmetrically where the pressure is applied to the crown of the tooth and may push it away from its direction of eruption. The lateral type of dentigerous cyst is a radiographic appearance that results from dilatation of the follicle on one aspect of the crown. This type is commonly seen when an impacted mandibular third molar is partially erupted so that its superior aspect is exposed. In the circumferential dentigerous cyst, the entire tooth appears to be enveloped by cyst.[9]



(a) central; (b) lateral; and (c) circumferential types of dentigerous cysts

Biochemical Analysis : Aspiration shows straw colored fluid cholestrol crystals.[10] The total protein content in the dentigerous cyst is usually 4-8 g/100 ml.[11]

Histological Features : The histological features of dentigerous cysts may differ greatly depending mainly on whether or not the cyst is inflamed. In the non-inflamed dentigerous cyst, a thin epithelial lining may be present with the fibrous connective tissue wall loosely arranged with inflammatory cells. As the lining is derived from reduced enamel epithelium it is 2-4 cell layer thick primitive type. The cells are cuboidal or low columnar. Retepegs formation is absent except in cases that are secondarily infected. As the connective tissue wall is derived from the dental follicle of developing enamel organ, it is a loose connective tissue stroma, which is rich in acid mucopolysaccharides. In the inflamed dentigerous cyst, the epithelium commonly demonstrates hyperplastic rete ridges and the fibrous cyst wall shows an inflammatory infiltrate. Rarely sebaceous glands in the walls are observed. The content of the cystic lumen is usually thin watery yellow fluid and is occasionally blood tinged.[12]



Wall of a dentigerous cyst lined by a thin epithelium of 2–4 layers of undifferentiated cells derived from the reduced enamel epithelium. The fibrous cyst wall is relatively uninflamed and sparsely cellular.

Potential Complications : 1) The development of an ameloblasto ma either from the lining epithelium or from rests of odontogenic epithelium in the wall of the cyst. 2) The development of epidermoid carcinoma from the epithelium. 3) The development of a mucoepidermoid carcinoma, basically a malignant salivary gland tumor, from the lining epithelium of the dentigerous cyst which contains mucus secreting cells.

Ameloblastomatous potential of dentigerous cysts, it is thus important to be able to recognize true ameloblastomatous epithelium from ameloblastoma -like epithelium. Diagnosis of unicystic ameloblastomas, as were described by Vickers and Gorlin, are cysts which are lined by an ameloblastic epithelium, with a tall columnar basal layer, a sub nuclear vacuole, reverse polarity of hyper chromatic nucleus and a thin layer of oedematous, degenerating stellate reticulum like cells on surface.[13] The differential diagnosis of dentigerous cyst includes Unicystic ameloblastoma, Adenomatoid odontogenic cyst, calcifying epithelial odontogenic tumor, Ameloblastic fibroma, Ameloblastic fibro-odontoma and odontogenic keratocyst.[14]

Treatment : Marsupialization and decompression may represent the treatment of choice, but they are also useful prior to extensive enucleation or curettage.[15]

The following guidelines are recommended for the diagnosis of a dentigerous cyst: (1) a pericoronal radiolucency larger than 4 mm in greatest width as assessed on a panoramic radiograph, (2) histologically, fibrous tissue lined by nonkeratinized stratified squamous epithelium, and (3) a surgically demonstrable cystic space between enamel and overlying tissue. Of these criteria, the third is the most critical, but all three must be satisfied.[16]

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