

Dentigerous cyst

From supernumerary teeth

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Authors

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Abstract

Dentigerous cysts are the most common developmental odontogenic cysts. They are usually derived from the epithelial remnants of tooth forming organs. These cysts increase in size gradually. There may also be associated bone resorption. Managing these lesions creates problems in children. It is always better to be conservative in managing this problem in children because dentition is yet to complete in them.

Introduction:

Dentigerous cysts are the most common developmental odontogenic cysts. They are usually derived from the epithelial remnants of tooth forming organs¹. Dentigerous cysts are classically defined as cystic lesions that are caused by separation of follicles from around the crown of unerupted teeth. Most commonly dentigerous cyst involves lower 3rd molar (mandibular)². Dentigerous cysts were earlier termed as "Follicular cysts" since it was assumed that these cysts were derived from tooth follicle which is a mesodermal structure. Later this term was abandoned as it was conceived on an erroneous perception. Dentigerous cysts can also be caused by:

1. Impacted teeth
2. Supernumerary teeth – Is defined as teeth in excess of usual configuration of 20 deciduous and 32 permanent teeth. Dentigerous cysts arising from supernumerary teeth accounts for nearly 5% of all these cysts.
3. Ectopic teeth (eruption of a teeth in sites other than the natural position). Most commonly seen ectopically erupted teeth involves 3rd molars
4. Rarely a tooth / root of teeth may be found in the sinus cavity. This teeth may have dentigerous cyst associated with it³.

Theories of dentigerous cyst formation:

Usually all dentigerous cysts arise from the enamel organ after completion of amelogenesis. Dentigerous cyst arises due to accumulation of fluid causing separation of enamel of the unerupted tooth. The fluid present inside the cyst is hyperosmolar due to the presence of albumin, immunoglobulin and squamous epithelial debris. This hyperosmolar fluid causes influx of extracellular fluid into the cyst causing huge expansion of cyst to occur. The epithelial lining of the cyst secretes collagenase and osteoclast activating factor which causes local bone resorption causing further increase in the size of the cyst. This enlarging cyst encloses the crown of the unerupted teeth and is

attached to its cemento-enamel junction.

Theories explaining genesis of Dentigerous cyst:

1. Theory of stimulation

2. Theory of inflammation⁴

Incidence:

Studies reveal that dentigerous cyst constitute more than a quarter of all jaw cysts. It predominates during the 2nd – 3rd decades of life⁵. There is a very slight male preponderance.

Majority of dentigerous cysts involves the mandibular third molar while maxillary canine is the next in the order of involvement. Very rarely dentigerous cyst can occur from ectopically erupted tooth within the maxillary sinus⁶.

Symptoms:

These patients usually present with painless slow growing swelling involving the affected area. This swelling is very firm on palpation indicating cortical expansion. If it is present in the upper jaw then the swelling could involve the hard palate also.

These cysts are usually painless and dormant. There may be some degree of expansion of cortical bone. Presence of pain and rapid swelling definitely indicates inflammation. Fistula can rarely occur when the dentigerous cyst is present in the maxillary sinus. These patients usually present with evidence of sinusitis⁷. When these cysts are aspirated then yellowish fluid could be observed. The swelling may also reduce in size following aspiration only to increase in size later.

Histology:

Histopathological examination of the cyst wall showed the cyst to be lined by reduced enamel epithelium. Connective tissue stroma will show features of primitive type of ectomesenchyme. Findings would depend on whether there is inflammatory component to the cyst is present or not. In non infected cysts the lining epithelium is 2-4 layers thick formed by primitive ectomesenchyme. These lining cells are low cuboidal to columnar. Reteplets could be seen only in cysts which are infected. The connective tissue stroma is loose and is rich in acid mucopolysaccharides. When the dentigerous cyst is inflamed then it is characterised by the presence of hyperplastic rete ridges and the cyst wall demonstrates inflammatory infiltrate.

Theories of dentigerous cyst formation:

Intrafollicular theory:

According to this theory cyst formation occurs due to fluid accumulation between the layers of inner and outer enamel epithelium after crown formation.

Enamel hypoplasia theory:

This theory suggests that dentigerous cyst formation occurs due to degeneration of stellate reticulum at a very early stage of tooth development. There is also associated enamel hypoplasia.

Main's theory:

This theory suggests that impacted tooth exerts pressure on the follicle with resulting obstruction of venous outflow. This induces rapid transudation of fluid across the capillary walls. This causes an

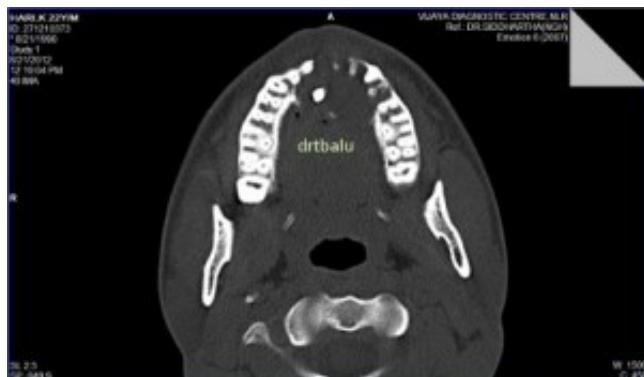
increase in the hydrostatic pressure exerted causing separation of crown from the follicle. This may be associated with reduced enamel epithelium.

Radiographic features:

In plain radiographs these cysts present as a well defined unilocular radiolucency. Often there is a demarcating sclerotic border. Since the cyst lining is derived from reduced enamel epithelium this radiolucency preferentially surrounds the crown of the teeth. A large dentigerous cyst may provide an impression as if it is multilocular. This appearance is due to the persistence of bony trabeculae within the radiolucency. These cysts are particularly unilocular in nature.

Radiographic types of dentigerous cysts:

1. Central variety: In this variety the radiolucency surrounds the crown of the unerupted teeth. The crown can clearly be seen projecting into the cyst lumen.
2. Lateral variety: In this variety the cyst develops laterally along the tooth root, partially encircling the crown
3. Circumferential variety: The cyst entirely surrounds the unerupted teeth. Radiologically the unerupted teeth could be seen within the cyst cavity.



Dentigerous cyst showing unerupted teeth



CT scan showing dentigerous cyst

Treatment:

The usual treatment of dentigerous cyst is careful enucleation of the cyst in toto. Unerupted tooth if present should usually be removed along with the cyst. Sometimes if eruption of this teeth is delayed orthodontic treatment may be advocated to assist eruption of unerupted teeth.



Dentigerous cyst

Marsupialization:

This is more conservative method than enucleation of the entire cyst. This should be considered as the first line of management in children with dentigerous cyst. Major advantage of this procedure is loss of viable permanent tooth buds can be prevented. These patients should be followed up carefully by performing radiological imaging every 6 months in order to keep an eye on potential recurrence. This follow up should be continued atleast for a period of 2 years following marsupialization.



Unerupted teeth seen inside dentigerous cyst

Why dentigerous cysts should be treated?

1. They block eruption of normal teeth
2. They increase in size and cause displacement of teeth
3. They can cause bone destruction
4. They can cause displacement of vital structures like inferior alveolar nerve

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