Case Report

Dentigerous Cyst associated with impacted permanent maxillary canine

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Abstract:
Odontogenic developmental cysts of jaws usually presents as asymptomatic lesions. Dentigerous cyst is one of the variety of these cysts which may grow to a large size intraosseously within jaws before it manifest clinically. Numerous immunohistochemical and molecular marker studies have been carried out for this lesion to understand its etiopathogenesis and aggressive behavior. Another reason being its potential to transform to ameloblastoma and squamous cell carcinoma. We present a case of dentigerous cyst associated with impacted maxillary canine manifesting as a unilateral swelling of midface region.

Key Words: Dentigerous cyst, unerupted, dental follicle, marsupialization.

Introduction:
Cysts of the jaw usually present as asymptomatic swellings of the mandible and midface region. Different varieties of the odontogenic cysts are the ones that develop from odontogenic epithelium or the epithelial remnants of the odontogenic apparatus. The second most common odontogenic cyst is the dentigerous cyst. A dentigerous cyst is one that encloses the crown of an unerupted tooth by expansion of its follicle, and is attached to its neck. (Shear & Speight, 2007) The diagnostic feature of this cyst is the presence of the unerupted tooth in its cavity (Johnson et al,1994). It is most frequently associated with mandibular third molar, maxillary canine, mandibular premolar and maxillary third molar in decreasing order of frequency (Jones et al ,2006). Most dentigerous cysts are asymptomatic, and their discovery is usually an incidental finding on radiography. The cyst being asymptomatic may attain a large size with resorption of the roots of teeth till it manifest clinically or become evident radiographically. It is now documented that the dentigerous cyst lining has the potential to develop into an aggressive ameloblastoma. Treatment includes enucleation of the cyst with the removal of the unerupted tooth. Marsupialization is occasionally done with very large cyst to decompress the cyst. Prognosis is excellent and recurrence is rare if completely removed.

Case Report:
A 11 year-old female patient presented with a progressively increasing swelling in the left maxillary midface region for last one month. Intraoral examination revealed a hard swelling with cortical plate expansion in relation to 63 to 25 (Fig.I).

Fig. I: intraoral view showing swelling extending from 22 distally upto 25

Distally tilted 22, grade II mobility in relation to 63 and grade I mobility with 24 was observed. Diagnostic orthopantomograph (Fig.II) showed a unilocular radiolucent lesion associated with 63, 24 and 25, 23 was seen impacted and enclosed within the lesion. Displacement of crown and root of 24, distal dilaceration.

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Discussion:

Dentigerous cyst is a condition characterized by the presence of a cystic lesion that encases the crown of an unerupted tooth. It is a developmental cyst that arises from the dental follicle and is attached to the neck of the tooth. The term ‘Follicular Cyst’ was earlier used, but this term was discontinued because it implies derivation from the tooth follicle, which is a mesodermal structure. The term ‘dentigerous’ is preferred due to its literal meaning of ‘tooth bearing’ (Browne & Smith, 1991).

Dentigerous cysts are associated with unerupted teeth. They are most commonly associated with mandibular third molars, maxillary canines, mandibular second premolars, and maxillary third molars (Neville et al., 2006). They may also occur around supernumerary teeth but are rarely associated with primary teeth (Neville et al., 2002; Kusukawa et al., 1992). Our case was related to a permanent maxillary canine.

These cysts can grow to very large sizes and can cause displacement of teeth, or in some cases, remain relatively small. The age range for dentigerous cysts varies widely, from 5 to 57 years (Shear, 2007). Many dentigerous cysts are small, asymptomatic lesions that are discovered during investigations of asymptomatic slowly-growing swellings.

Radiographically, the dentigerous cyst presents as a well-defined unilocular radiolucency, often with a sclerotic border. This radiolucency is typically and preferentially surrounded by the crown of the tooth. A large dentigerous cyst may give the impression of a multilocular process because of the persistence of bone trabeculae within the radiolucency. However, dentigerous cysts are grossly and histopathologically unilocular processes and probably never truly multilocular lesions (Shear, 2007). Three types of dentigerous cyst have been described radiographically: The central variety, in which the radiolucency surrounds...
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Hydrostatic pressure exerted by this pooling of fluid serum across the capillary walls. The increased venous outflow and induces rapid transudation of exerts pressure on the follicle which obstructs the development of enamel organ, it is a loose connective tissue stroma which is rich in acid mucopolysaccharides.

The histological features of dentigerous cysts may vary 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. 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. Rete pegs 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. Young fibroblast are present in the stroma. The cell lining may show metaplastic changes in the form of mucous producing cells or secretory cells such as goblet cells. Pseudostratified ciliated columnar epithelium has also been reported. 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.

Histopathogenesis of dentigerous cyst is based on intrafollicular and extrafollicular theories. There can be no good reason for the extrafollicular theory of origin of dentigerous cysts, as the evidence is that those reported as arising in this manner all appear to been developmental or follicular odontogenic keratocyst (Shear, 2007). Intrafollicular theory postulates the possibility of cyst formation due to fluid accumulation between the layers of inner and outer enamel epithelium after the formation of crown. Another possibility is due to degeneration of stellate reticulum at an early stage of tooth development resulting into cyst formation associated with enamel hypoplasia. (Al-Tabani & Smith, 1980).

Main’s theory (1970): The impacted tooth exerts pressure on the follicle which obstructs the venous outflow and induces rapid transudation of serum across the capillary walls. The increased hydrostatic pressure exerted by this pooling of fluid causes separation of crown from the follicle with or without reduced enamel epithelium.

The osmolarity of the cyst fluid is modified by increased permeability to glycosaminoglycans like hyaluronic acid, heparin & chondroitin sulphate which causes expansile growth rapidly (Browne & Smith et al, 1980).

Edamtsu et al (2005) examined the expression of Fas, bcl-2 & single stranded DNA (ss-DNA) in dental follicles to classify the possible role of these apoptosis-related factors in the pathogenesis of dentigerous cyst. Fas is a cell surface glycoprotein that transmits apoptotic signals from the cell surface to the cytoplasm, while bcl-2 proto-oncogene encodes a protein that inhibits apoptosis. ss-DNA antibody recognizes DNA fragmentation in the nuclei during programmed cell death as well as Deoxy-Nucleotidyl transferase mediated dUTP-biotin nick end labeling (TUNEL).

These apoptosis related factors are detected in tooth germ tissues and several types of epithelial odontogenic cysts & tumors. Expression of Fas & single stranded-DNA was detected in superficial epithelial cells of both follicles & cyst. Expression of Ki 67 and bcl-2 was also found positive in basal cells.

Most dentigerous cysts are treated with enucleation of the cyst and removal of the associated tooth. Large dentigerous cysts may be treated with marsupialization when enucleation and curettage might otherwise result in neurosensory dysfunction or predispose the patient to an increased chance of pathological fracture. Occasionally it transforms to squamous cell carcinoma, mucoepidermoid carcinoma, or ameloblastoma from or in association with a dentigerous cyst (Banderas et al, 1996; Johnson et al, 1994; Eversole et al, 1975; Leider et al, 1985).

The prognosis for most histopathologically diagnosed dentigerous cysts is excellent, recurrence being a rare finding. In all dentigerous cyst, the microscopic features must be determined, to rule out its transformation in an ameloblastoma or, to squamous-cell carcinoma.

Bibliography:


