All About Dentigerous Cyst- A Review Article

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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 formation, diagnosis and management.

Key words: Cyst, un-erupted tooth, follicular space, fluid.

INTRODUCTION

Dental (jaw) cysts were first described by Scultet (1671) as Liquid tumours. Dentigerous cyst were first described in France in 1778 but was not delineated until 1842 when Harris C.A published a case report on dentigerous cyst. Dentigerous cyst can be either Intrafollicular- Accumulation of fluid either between the reduced enamel epithelium and the enamel, or within the enamel organ itself or dental lamina. i.e. Degeneration of stellate reticulum at an early stage of development – associated usually with enamel hypoplasia. Or it may develop after completion of the crown by accumulation of fluid between the layers of the reduced enamel epithelium.

Or Extrafollicular: Foci of enamel hypoplasia. It diminishes the adherence of reduced enamel epithelium to crown. Provides starting point for the development of the cyst. Crown of permanent tooth may erupt into a radicular cyst of it’s deciduous predecessor – exceptionally rare – tooth may indent rather than penetrate the wall. Inflammation at the apex of the deciduous tooth can lead to the development of an inflammatory
follicular cyst – Benn (1991). Dentigerous cyst develops around an un-erupted tooth by accumulation of fluid between the reduced enamel epithelium and the enamel, or between layers of reduced enamel epithelium. How this happens (Main 1970). Potentially – erupting tooth Exerts pressure over impacted follicle → obstructions Venous out flow → Breakdown of proliferating cells of follicle → Rapid transduction of serum across the capillary wall → Pooling of fluid → Increased hydrostatic pressure → Separation of follicle from the crown with or without reduced enamel epithelium – with time → Altered capillary permeability → Permit the passage of greater quantities of protein and transudate → Dentigerous cyst.¹

Cyst expansion: Increased osmolality of cyst fluid Increase in the internal hydrostatic pressure of the cyst. Connective tissue of cyst particularly adjacent to the epithelium (Contain mast cells → due to metabolic turnover and inflammatory degradation → Release heparin sulphate → Glycosaminoglycans and proteoglycans. Many dentigerous cysts show acute and chronic inflammation in their walls (here exudation play some part in the expansion of the cyst. Desquamated epithelial cells + inflammatory cells → Passage into cyst cavity → Increased intracystic osmotic tension → further expansion. Role of prostaglandins in expansion (Arendorg 1981): PGE₂ and PGE₃ - Released from the dental follicle (i.e. capsule and its leukocyte content) → May resorbs cementum and dentine and cause expansion.²

Mechanism of Bone Destruction (Meghji, Harvey, and Harris 1989): Monocyte – Macrophage infiltrate + Stromal fibroblasts + epithelial cyst linings → Release interleukin – 1 → Number of osteolytic cell reactions → Stimulation of osteoclasts and resorption of bone and stimulation of connective tissue cells and produce prostaglandins. Stimulates connective tissue cells → Production of Collagenase → Destruction of bone matrix.

Clinical features³: Incidence: 20% of all epithelium lined cysts of the jaws (Gnepp 2001). 4% of individuals with atleast one unerupted tooth have a dentigerous cyst. 2.6% of patients with one or more unerupted teeth have dentigerous cyst – Mourshed (1964). 0.81% of impacted – 3rd molars. Mervyn Shear. Age: May occur at any age but common in teenagers and young adults (Gnepp 2001). (10 -30 years)

Sex: Males > Females (2: 1) (Browne and Killey 1982).

Race: Whites > Blacks.

Site: Mandible > Maxilla, mandibular third molars > Increased maxillary canines > Mandibular premolars, maxillary third molars.

Clinical Presentation: Asymptomatic lesions- discovered during routine radiographic examination. Sometimes grow to considerable size and produce bony expansion – usually painless unless secondarily infected. It may produce hard swelling and facial asymmetry. If infected, it produces pain and swelling – occur in partially erupted tooth or by extension from periapical or periodontal lesions of adjacent teeth.

(See fig.1)
Multiple Dentigerous Cysts: Roberts and Colleagues (1984). (Associated with mucopolysaccharidosis type VI (Maroteaux Lamy syndrome), Basal cell nevus syndrome, cleidocranial dysplasia. Second most common type of cyst in the jaws. It forms about 16% of oral cyst. dentigerous cyst is one of the most common jaw bone cyst (15.7%), Moursheed(4) and Daley et al., Follicular spaces >5mm (normal 2-3 mm) should be closely followed for potential development of dentigerous cysts.4,5

Radiological features: Unilocular radiolucency with well defined sclerotic border unless infected. Attached to cementoenamel junction of the tooth. (See Fig. 2)

Three types: Central: Crown enveloped symmetrically. Pressure may push the tooth in the downward direction. Lateral: Dilatation of follicle on only one side of the tooth. Partially erupted third molar. Circumferential: Entire tooth is enveloped by the radiolucency.6


Diagnostic work-up: Aspiration: straw colored fluid cholesterol crystals.7

Histopathological Features: If not infected, thin, flattened layer of non-keratinizing epithelium without rete ridge formation. Loose fibrous connective tissue which often contains small islands or cords of inactive – appearing scattered odontogenic epithelial rests – with glycosaminoglycan ground substance → sometimes these undergo dystrophic calcification. Inflamed → Epithelial lining – Thicker, Rete pegs. Wall of inflamed cyst – more densely collagenized. Source for intravenous mucoepidermoid carcinoma. Focal mucin producing cells (Mucous cells) are often found in the epithelial lining. Rarely ciliated epithelial cells may be found. Sabaceous cells maybe noted within the fibrous cyst. Mucous, Ciliated and Sebaceous: Elements
represents – multipotentiality of the odontogenic epithelial lining. Immunohistochemical study shows higher IgG containing plasma cells and lower percentage of IgA containing plasma cells in dentigerous cysts than other cysts especially keratocysts.

**Investigations:** Clinical examination, Tooth vitality tests, Fine needle aspiration cytology (FNAC), Radiographs, Biopsy & Ultrasound.

**Treatment:** *Small* – Enucleation + Removal of impacted tooth or tooth left with cyst enucleation and made to erupt. *Large:* Morsupialization – Permits decompression of the cyst, with reduction in bone defect. Prognosis is excellent while recurrence is rare.

**Complication:** Ameloblastoma, Squamous cell carcinoma (1-2%) odontogenic cysts 25% in dentigerous cysts, Intraosseous mucocoeidermoid carcinomas – from mucous lining of a dentigerous cyst.

Differential diagnosis: Radiological- Follicular space , Unicystic ameloblastomas Ameloblastoma, AOT, Ameloblastic fibromas & OKC.

**Clinical:** Nasopalatine duct cyst & Globulomaxillary cyst .

**Key features:** Intra osseous, associated with crown of an impacted tooth, Attached to the neck (CEJ) of the tooth, Mandibular 3rd molars, maxillary canine, Radiographically mistaken for OKC, Unicystic ameloblastoma, Respond to treatment & no recurrence.

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