Radicular Cyst: A Literature Review.

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ABSTRACT:

Residual cyst is considered to be a variant of radicular cyst that remains behind in the jaws after removal of the offending tooth. Along with the radicular cysts, they are by far the most common cystic lesions in the jaws. Because of its close association with the periapical cyst, it is more appropriate to refer it to in the discussion of radicular cysts. In this review article on Radicular Cyst, early diagnosis is stressed upon for patient prognosis.

Key words: Cyst, Residual, Inflammation, Root

INTRODUCTION:

Radicular cyst is one which arises from the epithelial residues in the periodontal ligament as a result of inflammation, following the death of the dental pulp and are usually found most commonly at the apices of the involved tooth. Synonyms are Periapical cyst, apical periodontal cyst, dental cyst, root end cyst.
Pathogenesis:
It is convenient to consider the pathogenesis of radicular cysts in three phases that include:

Phase of initiation
Phase of cyst formation
Phase of enlargement

It is derived from epithelial cell rests of Malassez in the periodontal which come to lie in periapical granulomas associated with teeth with dead, often infected pulps. These cell rests proliferate. These cells show some morphological and histochemical changes. The proliferating cells show a decrease in nucleocytoplasmic ratio, utilize glycogen, synthesize neutral lipid and ribonucleic acid, increased G-6-P dehydrogenase but depressed succinic dehydrogenase activity. Some product of dead pulp may initiate the epithelial cells to proliferate and at the same time evokes an inflammatory reaction. The changes in the supporting C.T. may be responsible for activation of cell nests and that a decreased O₂ and increased CO₂ tension and a local education in pH produced in chronic inflammation may be the critical factor.

PHASE OF CYST FORMATION – 2 concepts.

1st Concept:
Epithelium proliferates and covers the base connective tissue surface of an abscess cavity or a cavity which may occur as a result of connective tissue breakdown by proteolytic enzyme activity Stockdale, 1988).

Other concept:
Cystic cavity develops within a proliferating epithelium mass in an apical granuloma by degeneration and death of cells in the centre.

Historical evidence for this hypothesis is proliferating epithelium masses show considerable intercellular oedema. These intercellular accumulations of fluid coalesce to form microcysts containing epithelial and inflammatory cells. High levels of acid phosphatase and weak photolytic activity was present centrally within proliferating epithelium of apical granulomas suggest that these cells are undergoing autolysis. Epithelium cells in periapical granuloma adhere to each other by fewer desmosomes than in normal squamous epithelium. Microcyst increase in size by coalescence with adjacent microcysts.
Torabinejad (1983) postulated that not the lack of blood supply accounts for the death of the central epithelium cells in an apical lesion, but the development of the cavities in proliferating epithelium and the final destruction of these cells are mediated by immunological reactions. Btu did not explain why the central and not the peripheral proliferating cells or targeted in this manner.7
Clinical Presentation:
Usually asymptomatic, unless secondarily infected.
Associated with non vital tooth.
Slowly enlarging swelling
Initially, the enlargement is bony hard but as the cyst increases in size the cortex thins \(\rightarrow\) crepitant and if bone is destroyed \(\rightarrow\) rubbery or fluctuant the swelling exhibits springiness.
In maxilla \(\rightarrow\) Buccal or palatal enlargement. Mandibular – Usually labial or buccal and rarely lingual.
Occasionally a sinus may lead from the cyst city to the oral mucosa.
More than one cyst may be found in a patient (Shear, 1961; Stoelinga 1973). Many authors believe that there are cyst prone individuals with defective immunological surveillance and suppression mechanism (Tover 1970) (Oehlers, 1970). It is also possible that some individuals have a genetic tendency to develop radicular cyst.
Radicular cyst arising from deciduous teeth appear to be very rare.

RADIOLOGICAL FEATURES:
Location: Epicentre of a root canal is located approximately at the apex of a non vital tooth. Occasionally appears on the mesial or distal surface of a tooth root at the opening of an accessory canal or infrequently in a deep PD pocket.
Periphery and Shape: Well defined cortical border. Loss of this cortex is seen if cyst becomes infected or alteration of the cortex into a more sclerotic border.\(^8\)
Outline: Curved or circular unless it is influenced by surrounding structures
Internal Structure: Occasionally dystrophic calcification may develop and appear as sparsely distributed, small particulated radio opaque
Effects on surrounding structures: Displacement, resorption of the roots of adjacent teeth may occur. Resorption pattern may have a curved outline (20% cases). Rarely roots of related non-vital tooth may be resorbed cyst may invaginate the antrum. The outer cortical plates may expand in curved or circular shape. Cyst displaces the mandibular alveolar nerve canal in an inferior direction.\(^9\)

HISTOPATHOLOGICAL FEATURES:
The cystic wall varies from being thin to the thick of approximately 5 mm. The inner Surface appears smooth or corrugated with projection of yellow mural nodules of cholesterol into the cavity. Fluid contents are usually brown form the breakdown of blood and when cholesterol crystals are present – impact a shimmering gold or straw colour.
The cyst wall is lined by stratified squamous epithelium and ranges in thickness form one to 50 cell layers. Majority are between six and 20 cell layers thick, demonstrating exocytosis, spongiosis of hyperplasia.
Proliferating epithelium is associated with intense inflammatory process consists predominantly of PMN leucocytes whereas the adjacent fibrous capsule is infiltrated mainly by chronic inflammatory cells. Ortho or para keratinized linings are very rarely seen in radicular cyst. Tronstad (1992) believed it, represented a type of dental cuticle. Philippou, Nair (1993) by X-ray analysis suggested that foreign material irritates the epithelium cells to produce a fine grained matrix which encloses the coarse-grained foreign material and undergoes different degrees of homogenization. This they called the hyaline body type II.

Gao (1996) believed that hyaline bodies were of haematogenous origin and were derived from thrombi in venules of the connective tissue which have become varicose and strangled by epithelium cuffs which encircle them. They suggested that the thrombi shrink centrifugally and undergo splinting or they may calcify.

**TREATMENT:**
Excision through extraction or curettage or endodontic treatment and apical surgery.
Enucleation
Marsupialization
Decompression
Decompression with delayed enucleation
Decortication and bone replacement for large cyst

**MALIGNANT TRANSFORMATION:**
Squamous cell carcinoma may occasionally arise form epithelium lining of radicular cyst. Kay and Kramer (1962) reported squamous cell carcinoma form residual cyst.  

**REFERENCES:**