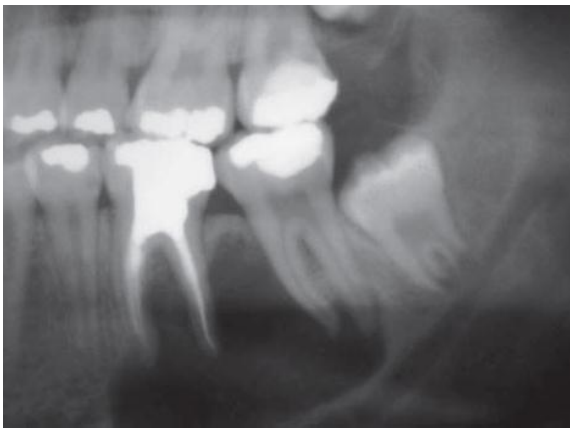
Periapical cyst

Pathogenesis: Epithelium at the apex of a nonvital tooth can be stimulated by inflammation to form a true epithelium-lined cyst. The inflammatory response appears to increase the production of (keratinocyte growth factor) by periodontal stromal cells, leading to increased proliferation of normally quiescent epithelium in the area. The source of the epithelium is usually (a rest of Malassez, crevicular epithelium, sinus lining, or epithelial lining of fistula tracts).

Clinical features: Periapical cysts constitute approximately one half to three fourths of all cysts in the jaw. The age distribution peaks in the third through sixth decades. It is relatively rare in the first decade of life. Typically, patients with periapical cysts have no symptoms unless there is an acute inflammatory exacerbation. When the cyst reaches large size, swelling and mild sensitivity may be noted. Movement and mobility of adjacent teeth are possible as the cyst enlarges. The tooth from which the cyst originated does not respond to thermal and electric pulp testing. Periapical cysts represent a fibrous connective tissue wall lined by epithelium with a lumen containing fluid and cellular debris. (Theoretically, as the epithelium desquamates into the lumen, the protein content is increased. Fluid enters the lumen in an attempt to equalize the osmotic pressure, and slow enlargement occurs. Most periapical cysts grow slowly and do not attain a large size).

Radiographical features: The radiographic pattern is identical to that of a periapical granuloma. Both radiographic size and the shape of the lesion are not used for the definitive diagnosis. A loss of the lamina dura is seen along the adjacent root, and a rounded radiolucency encircles the affected tooth apex. Root resorption is common. With enlargement, the radiolucency often flattens out as it approaches adjacent teeth. Significant growth is possible, and lesions occupying an entire quadrant have been noted. Periapical cysts are known to involve deciduous teeth. These are most frequently associated with

molar teeth and appear as a radiolucent zone that surrounds the roots and fills the interradicular space at the bifurcation area.

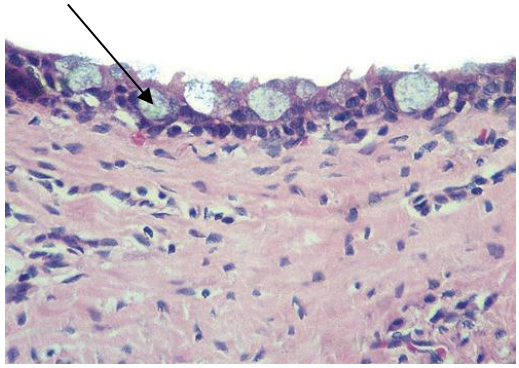


Periapical cyst associated with a mandibular first molar

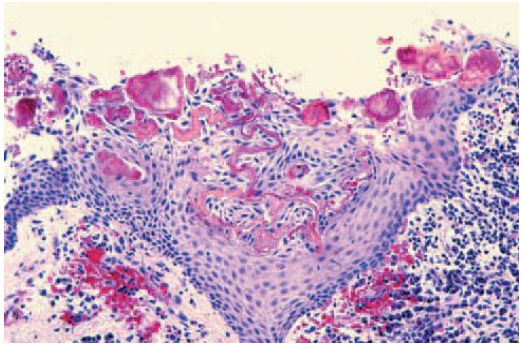
Histopathological features: the cyst is lined by non-keratinized stratified squamous epithelium, which may demonstrate exocytosis, spongiosis, or hyperplasia. Scattered mucous cells or areas of ciliated pseudostratified columnar epithelium may be noted in periapical cysts. Although some maxillary periapical cysts lined by pseudostratified columnar epithelium may have originated from the adjacent sinus lining, the presence of mucous cells or respiratory-like epithelium also can be observed in mandibular cysts. The ability of odontogenic epithelium to demonstrate such specialized differentiation represents an example of prosoplasia (forward metaplasia) and highlights the diverse potential of odontogenic epithelium. The cyst lumen may be filled with fluid and cellular debris.

The lining epithelium may demonstrate linear or arch-shaped calcifications known as Rushton bodies. Dystrophic calcification, cholesterol clefts with multinucleated giant cells, red blood cells, and areas of hemosiderin pigmentation may be present in the lumen, wall, or both. The wall of the cyst consists of dense fibrous connective tissue, often with an

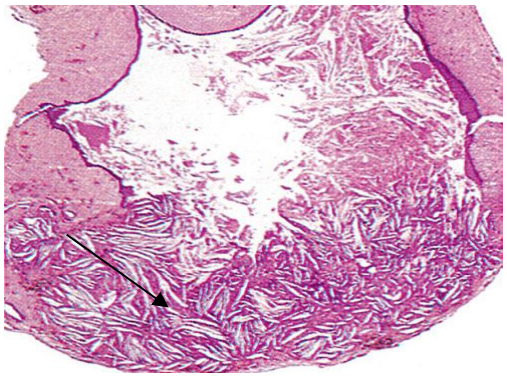
inflammatory infiltrate containing lymphocytes variably intermixed with neutrophils, plasma cells, histiocytes, and rarely mast cells and eosinophils.



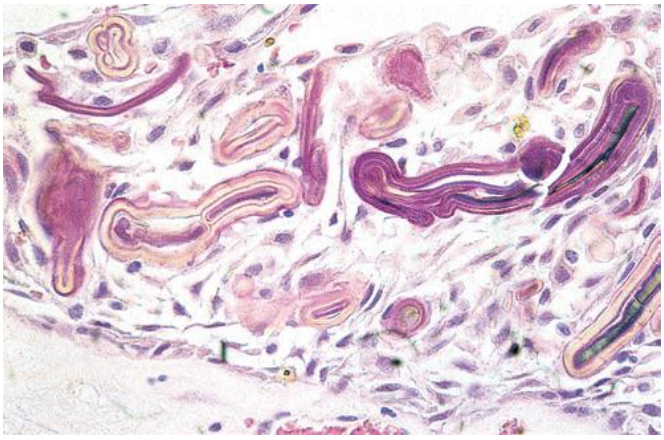
Mucous metaplasia in a radicular cyst. This change is of no clinical significance and happens in a proportion of all cyst types, but is most typical of dentigerous cysts.



Periapical cyst. Squamous epithelial cyst lining exhibiting numerous irregular and curvilinear Rushton bodies.



Cholesterol clefts in a cyst wall



Hyaline or Rushton bodies. These translucent or pink-staining lamellar bodies are secreted by the cyst lining epithelium and indicate the odontogenic origin of a cyst.

Differential Diagnosis

Radiographically, a differential diagnosis for periapical cyst must include periapical granuloma. In areas of previously treated apical pathology, a surgical defect or a periapical scar might also be considered. In the anterior mandible, periapical radiolucency should be distinguished from the earliest developmental phase of periapical cemento-osseous dysplasia. In the posterior quadrants, apical radiolucencies must be distinguished from a traumatic bone cyst. Occasionally, developmental odontogenic cysts, odontogenic tumors, giant cell lesions, metastatic disease, and primary osseous tumors may mimic a periapical cyst radiographically. In all of these considerations, associated teeth are vital.

Treatment and prognosis: Extraction or conservative nonsurgical endodontic therapy is performed. Large cystic lesions (exceed 2 cm) may not resolved with conventional endodontic therapy, for these lesions if the tooth is restorable then conservative endodontic therapy combined with biopsy and marsupialization, decompression, or fenestration is recommended. Follow-up at 1 and 2 years is mandatory. If the radiolucency fails to resolve, then the lesion often can be managed successfully by nonsurgical endodontic retreatment.

Periapical surgery typically is performed for lesions exceeding 2 cm and those associated with teeth that are not suitable for conventional endodontics. Biopsy is indicated to rule out other possible pathologic processes. Rarely squamous cell carcinoma has been reported within periapical cysts; therefore, even in the absence of symptoms, treatment is required for all persistent intrabony pathoses that have not been diagnosed definitively by histopathologic examination.

Cysts that become secondarily infected must have the infection treated first by antibiotics and drainage to avoid performing surgery in an infected field. Once the infection is controlled, the cyst is removed.

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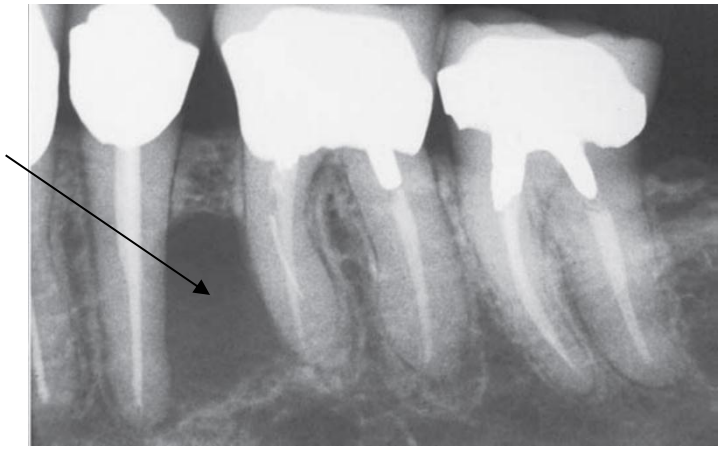
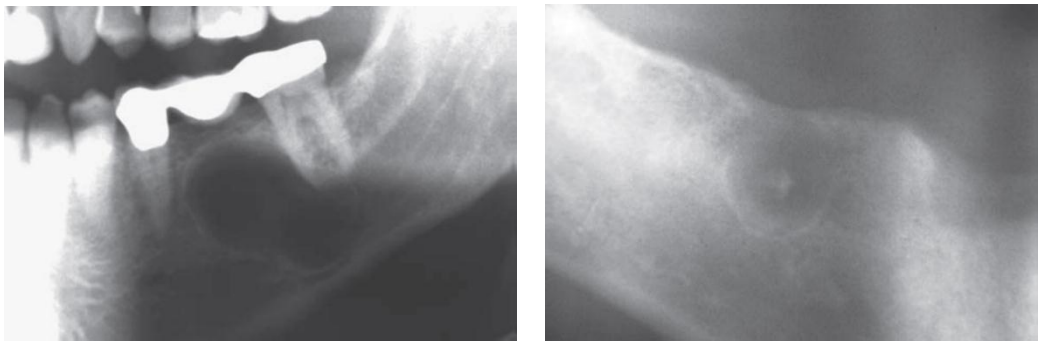
Similar cyst, termed a ***lateral radicular cyst***, may appear along the lateral aspect of the root. Like the periapical cyst, this lesion also usually arises from rests of Malassez, and the source of inflammation may be periodontal disease or pulpal necrosis with spread through a lateral foramen. Radiographically, these cysts mimic developmental lateral periodontal cysts. Histopathologically, they are consistent with periapical cysts.



Lateral radicular cyst

Periapical inflammatory tissue that is not curetted at the time of tooth removal may give rise to an inflammatory cyst called a ***residual periapical cyst***. With time, many of these cysts exhibit an overall reduction in size, and spontaneous resolution can occur from a lack of continued inflammatory stimulus. The residual periapical cyst appears as a round-to-oval radiolucency of variable size within the alveolar ridge at the site of a previous tooth extraction. As the cyst ages, degeneration of the cellular contents within the lumen occasionally leads to dystrophic calcification and central luminal radiopacity. The histopathological features are identical to periapical cyst.

Residual cyst. The causative tooth has been extracted leaving the cyst in situ



Residual periapical cyst