Periapical Cyst
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**Overview**

A periapical cyst also known as a radicular or odontogenic cyst is the most common type of cystic lesion related to teeth. Periapical cysts usually result from an infection of the tooth and the resultant decay which spreads to the apex and into the adjacent bone. This leads to apical periodontitis, granuloma formation and eventual cyst formation. These cysts are usually small, and hard to detect, and can contain fluid (blood, gel, pus) or gas.

**Etiology**
According to et al (2011) a periapical abscess forms when inflammatory cells accumulate at the apex of a non-vital tooth. Frequently, the source of the infection is obvious and is associated with a carious lesion or is the result of a previous injury to the tooth and pulpal tissue.

**Clinical Presentation**
As Motamedi (2010) explains most patients with this condition are asymptomatic, and it is usually found incidentally through radiographs. It is also possible that a patient will show swelling but this occurs slowly and only presents with larger lesions. The cyst may be painful if it is infected, but patients without infections have also be known to complain of them.

**Demographic**
The periapical cysts usually forms between the 4th and 6th decade of life. It is more common in males than it is in females. And it involves more white patients than black patients.

**Biopsy / Histology / Radiographs**
Chapman et al (2013) explain that histologic examinations of the periapical tissue is needed to make a definitive diagnosis of this condition but it is not practical to do so. The histologic exam would find that it is a true cyst with an epithelial lining.

With a plain radiograph or CT most radicular cysts appear as round- or pear-shaped, unilocular, lucent lesions in the periapical region 3. They are usually less than 1 cm in diameter and are bordered by a thin rim of cortical bone. The associated tooth usually has a deep restoration or large carious lesion. Caries will appear as erosion of the enamel/crown of the associated tooth.

With an MRI periapical cysts appear as a non-enhancing lesion at the apex of a tooth. These cysts typically return low T1 signal and high T2 signal. An MRI is not usually the first-line imaging modality.

**Differential Diagnosis**
As Hyo Jin, J et al (2017) show and argue there is no radiographic difference between a periapical cyst, a periapical abscess and a periapical granuloma. For a periapical abscess the inflammation involves tooth root apex; other possible diagnoses could be dentigerous cyst where the lesion is around the crown of an unerupted/impacted tooth and keratocystic odontogenic tumor. Some other possible diagnoses could be due to periapical surgical defects, periapical scars or traumatic bone cyst.
 **Treatment**

Dandotikar et al (2013) argue that the periapical cysts respond favorably to non-surgical endodontic treatment and that this should be considered the primary treatment modality. With this said the most common treatment for this condition is a 'root canal' procedure, with the aim of saving the tooth. If the cyst is very large there may be need for some follow up surgical procedure. The two main surgical treatments are enucleation and marsupialization.

**Prognosis**
The outcome for treatment of this condition depends on the tooth affected, its accessibility for treatment, the size of the cyst and the extent of the bone destruction. In general the root canal is a safe and effective way to treat this condition.

One possible outcome from the procedure is that there is a secondary infection from the cyst itself which may create additional complications. Furthermore there are rare complications that make this a more dangerous condition to deal with; specifically various carcinoma have been known to arise from the epithelial lining of periapical cysts, and pathologic bone fractures can occur as well.

**Professional Relevance**
This is an extremely common problem that usually necessitates a complex yet routine procedure to correct it. There is literature that suggests that there may be other options for diagnosis and treatment that may be more favorable for patients. This combination of ubiquity and potential for innovation, makes this an extremely important area of professional relevance and interest.

**Bibliography**
Chapman, M. N., Nadgir, R. N., Akman, A. S., Saito, N., Sekiya, K., Kaneda, T., & Sakai, O. (2013). Periapical lucency around the tooth: radiologic evaluation and differential diagnosis. Radiographic: A Review Publication Of The Radiological Society Of North America, Inc, 33(1), E15-E32. doi:10.1148/rg.331125172

Dandotikar, D., Peddi, R., Lakhani, B., Lata, K., Mathur, A., & Chowdary, U. K. (2013). Nonsurgical Management of a Periapical Cyst: A Case Report. Journal Of International Oral Health, 5(3), 79.

Harleen, N., Bhoomika, A., Ramakrishna, Y., Sudhindra, B., & AChapman, M. N., Nadgir, R. N., Akman, A. S., Saito, N., Sekiya, K., Kaneda, T., & Sakai, O. (2013). Periapical lucency around the tooth: radiologic evaluation and differential diagnosis. Radiographics: A Review Publication Of The Radiological Society Of North America, Inc, 33(1), E15-E32. doi:10.1148/rg.331125172utar Krishen, M. (2011). Conservative non-surgical management of an infected radicular cyst. Contemporary Clinical Dentistry, Vol 2, Iss 4, Pp 368-371 (2011), (4), 368. doi:10.4103/0976-237X.91806

Hyo Jin, J., Se-Hee, P., Kyung-Mo, C., Jin Woo, K., & Suk Keun, L. (2017). Differential diagnosis of periapical cyst using collagen birefringence pattern of the cyst wall. Restorative Dentistry & Endodontics, Vol 42, Iss 2, Pp 111-117 (2017), (2), 111. doi:10.5395/rde.2017.42.2.111

MHK, M. (2010). To Cut or not to Cut: Can Large Periapical Cysts be Treated by Endodontic Treatment only?. Dental Hypotheses, Vol 1, Iss 1, Pp 17-22 (2010), (1), 17.