

Periapical Cemental Dysplasia

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**Overview**

Periapical cemental dysplasia (PCD) is a rare bone disease that can occur in the maxillofacial area and can cause misinterpretations due to the nature of its appearance radiographically. Understanding the implications, clinical signs and prevalence in different demographic populations allows for dental clinicians to be able to properly discern the difference of PCD among other pathological conditions that may occur.

Categorizing PCD can be a difficult task, due to the nature of the condition and similar counterparts. PCD is a benign fibro-osseous lesion, which entails that it is a non-cancerous condition where the normal bone undergoes a transformative process to become “abnormal” bone or cementum. Benign fibro-osseous lesions are classified into three distinct groups; ossifying fibroma, cemento-osseous dysplasia (COD), and fibrous dysplasia, based on their pathological, radiological, and clinical characteristics.

Among the three lesions, COD is the most prevalent and has a predilection for the mandible as its primary site of occurrence. COD can further be classified based on its specified location in the jaw. The three classifications are florid, focal, and periapical. Periapical COD manifests in the anterior mandibular region, focal COD manifests in a single quadrant and florid COD manifests in multiple quadrants.

**Etiology**

The etiology of PCD is still unknown; however, there has been a hypothesis that states that it may be from a hormonal imbalance that affects the remodeling of bone (Nam, et al., 2022)

**Clinical Presentation**

PCD is generally stumbled upon accidentally during routine dental visits when taking radiographs. In most cases, patients who have PCD are asymptomatic. However, some patients

may be symptomatic and experience symptoms; such as, pain, discomfort, loss of sensation and paresthesia in the area where the lesion is occurring.

Objectively, the progression of the stages of PCD can be observed radiographically, where in stages I and II, PCD presents as a radiolucent lesion in the apical region of the tooth, due to osteolysis (Tidke, et al., 2023). Stage III is considered the mature stage, where the lesion is seen as a dense radiopaque zone with a radiolucent halo, giving a mixed radiolucent/radiopaque appearance. The progression of PCD is projected to take over months or years. Additionally, the clinical presentation is very favored in the anterior mandible region.

### **Demographic**

In an analysis that was done of 191 clinical cases, the following were the reported statistics:

There were 178 (93.2%) female and 13 (6.8%) male patients. The average age of the male patients was 51.2 years (range: 18–86 years). The ethnicities of the male patients were: nine (69.2%) AA, two (15.4%) C, and two (15.4%) A. The average age of the female patients was 52.7 years (range: 18–94 years). The ethnicities of the female patients were: 151 (84.8%) AA, 22 (12.4%) C, 4 (2.2%) H, and 1 (0.6%) A (Decolibus, 2023)".

It was found that PCD predominantly affects middle-aged African women in their 40s and 50s, based on analysis of the cases, as well as, other sources. The condition has a predilection for the anterior mandibular region and the prevalence of symptomatic appearances increase with patient's age.

### **Biopsy / Histology / Radiographs**

PCDs are stumbled upon by accident, therefore, biopsies for such can be very situational. If a patient presents with pain and radiographs show a mixed radiolucent or radiopaque lesion on the apex of the anterior mandible regions, a biopsy may be necessary to avoid misinterpreting the pathology. An incisional biopsy can be done in order to look at the histologic appearance of the lesion. Biopsies may also be indication when patient is considering excision of lesion, in order to confirm the contents of the lesion.

Histology of the lesion can help make a definitive diagnosis based on the differential diagnoses that are developed throughout the diagnosing process. Histologically, PCDs can display fibrous tissue, cementum-like material, osteoblastic activity and vascularization. Some describe the early stages of PCD to be osteolytic stage, consisting of fibrotic tissue in cells and vessels, and cement-like deposits being absent. Maturation contributes to cement-like formations and irregular trabeculae to form and the final osteosclerotic stages show the connection amongst previously mentioned structures (Brody, et al., 2019).

As stated previously by Tidke, et al., in the clinical presentation section, PCD appears differently through the stages; initially starting off as a radiolucent lesion, slowly progressing into a mixed radiolucent and radiopaque lesion.

### **Differential Diagnosis**

Because there are many lesions that may appear similar radiographically, PCDs can be mistaken with many other conditions. By compiling a differential diagnosis, the possibilities can be minimized and narrowed down through histological means. Differential diagnosis includes, radicular cysts, ossifying fibroma, simple bone cysts, exostoses and hypercementosis, as well as, other conditions that may involve necrosis of the bone.

**Treatment**

For patients who are asymptomatic, a conservative approach is taken so that no invasive procedures are done unnecessarily. These patients may be monitored with occasional radiographs taken at each subsequent visit in order to observe for any possible further procedures that may be necessary.

For patients who experience pain and discomfort and are symptomatic, treatment generally starts from a conservative approach, but follow ups are necessary to ensure that the treatment is effective. In some cases, antibiotics or analgesics can be given for the possibility of a local infection before jumping to a surgical procedure. If patients do not feel relief, a surgical excision, curettage can be conducted to remove the lesion as a whole.

**Prognosis**

Generally, the prognosis for patients who are asymptomatic and do not receive treatment is favorable. PCDs are benign, so are not expected to grow aggressively. Patients who are symptomatic and receive treatment generally have a low recurrence rate and have a favorable prognosis as well.

**Professional Relevance**

As dental hygienists, we take on a role of understanding the oral manifestations that are possible. Though rare, PCDs can occur to anyone due to its unknown etiology. Understanding this can help misinterpreting radiographs and helping the dental team to make the adequate decision in treatment planning for the patient's best interest. Understanding also gives us the opportunity to educate the patient and have an honest conversation about what they have.

## References

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