

Management/Diagnosis of Periapical Osseous Dysplasia

Evidence Based Dentistry Rounds
Specialty: Oral Radiology/Pathology

Group 9A-4
9/23/2020

Rounds Team

Group Leader: Dr. Derderian

Specialty Leader: Dr. Demirturk

Project Team Leader: Kyrell Wright

Project Team Participants:

- **D1: Scott Meyers**
- **D2: Suzanne Kukec**
- **D3: Krystal Hoang**

Patient

- Age: 43 years old
- Gender: Male
- Ethnicity: African-American
- Chief Complaint: “I want to get my front tooth replaced immediately.”
- Presents with missing #8 and #2 permanent crown has fell off
- Financially challenged/driven

Medical History

Current & past:

- Broken hand surgery done in 2015
- Allergies: Pollen (Reaction – sneezing and coughing)
- Conditions: High blood pressure
- Medications: Oxycodone 15 mg three times a day for lower back and left knee pain
- Recommended he mention the high blood pressure readings to his physician

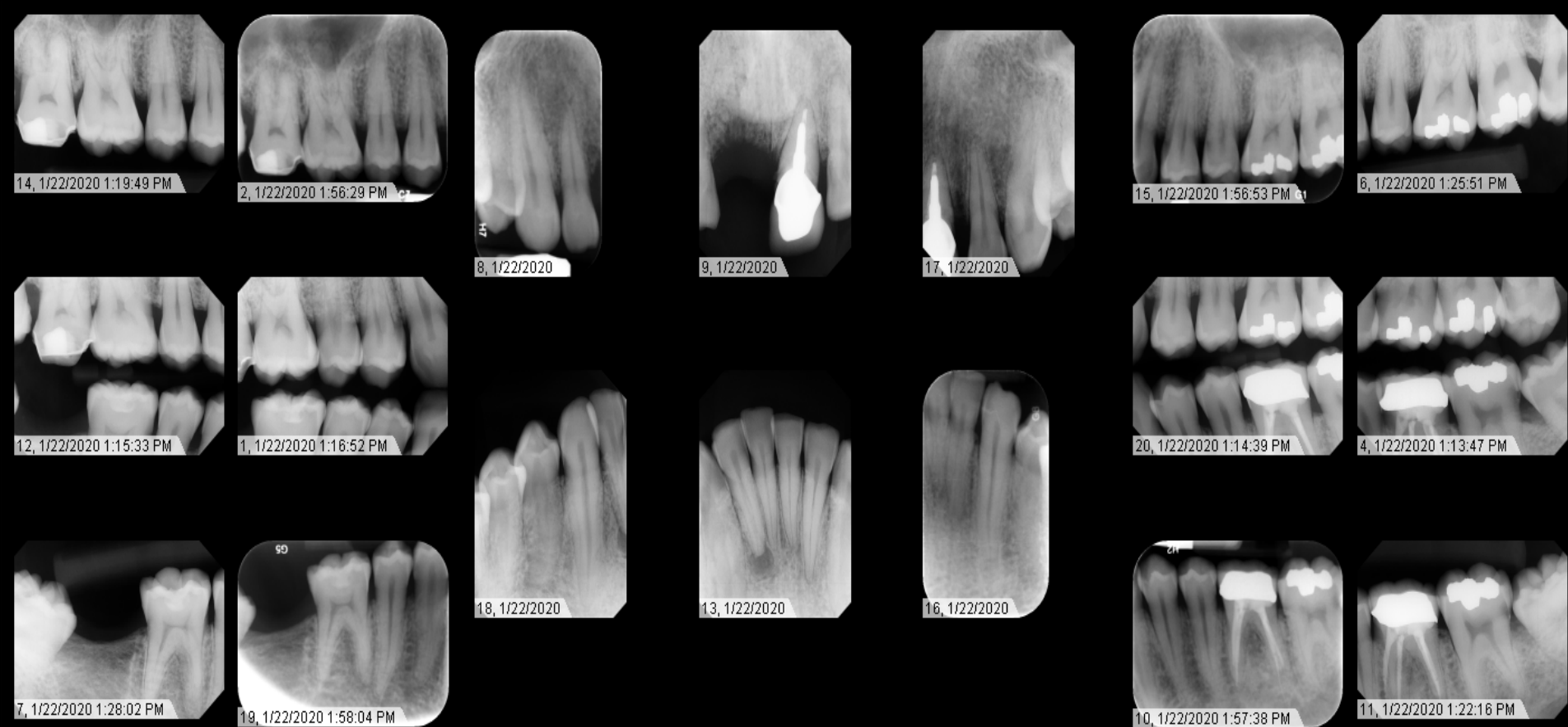
Dental History

- #2 permanent crown fell off
- #8 missing due to trauma
- #9 reimplanted, RCT, and crowned (avulsed from trauma)
- #19 RCT and crowned
- #31 extracted a long time ago
- Has all 4 wisdom teeth



Radiographs (Panoramic)

11/4/2019



Radiographs (FMX)

Radiographic Findings



Periapical Radiolucency
(PARL): Apex of #26
one root two canals



Endo Treated #9;
Radiographic
bone loss



Endo Treated
#19

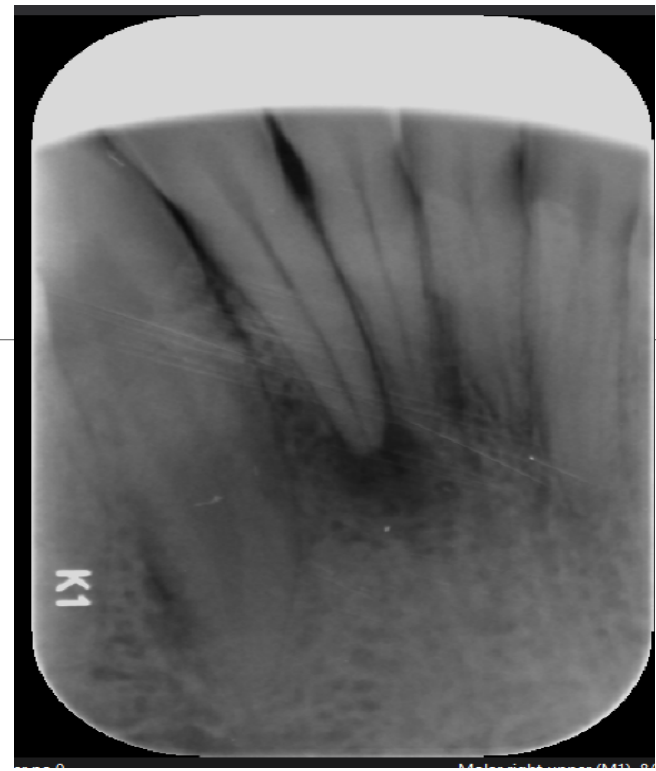
Clinical Findings

- Existing Restorations: #14: O amalgam, #15: O amalgam, #18: O amalgam, #30: O resin, #9: ACC and #19: PFM
- Missing Teeth: #8 and #31
- Conditions: (Incipient caries) - #1 O, #3 OL, #15 L, #16 O, #32 O
(Primary caries) - #18 D, #14 L, #17 O, #30 O
(Abrasion) - all incisal edges of #7, 22, 23, 24, 25, 26, 27



1/22/2020

- PDL and lamina dura is lost around the apex
- No pulpal changes
- No swelling
- No calcifications



8/24/2020

Pulp Sensibility Testing:

____Caries____Cold____Percussion____Palpation____

#25.....(-)____(6s)____(-)____(-)____

#26.....(-)____(6s)____(-)____(-)____

#27.....(-)____(6s)____(-)____(-)____

Patient describes no pain associated with tooth in question #26. All responses were normal.

Specific Findings

Periodontal Charting

[illegible][illegible]

Diagnosis

Periapical Osseous Dysplasia (POD)

a.k.a. Early form of Periapical Cemento-Osseous Dysplasia) (PCOD)

Problem List

- Missing front tooth (#8)
- Crown fell off on #2
- Primary caries on a few teeth.
- Moderate generalized plaque and localized deep pocket depths.
- PARL on #26

D1 Basic Science

What is the radiographic appearance of normal physiologic bone of the jaw?

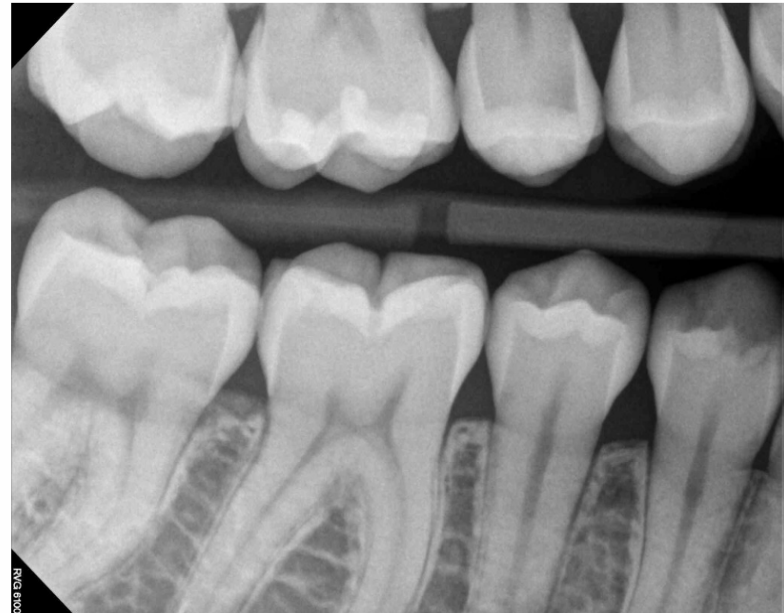
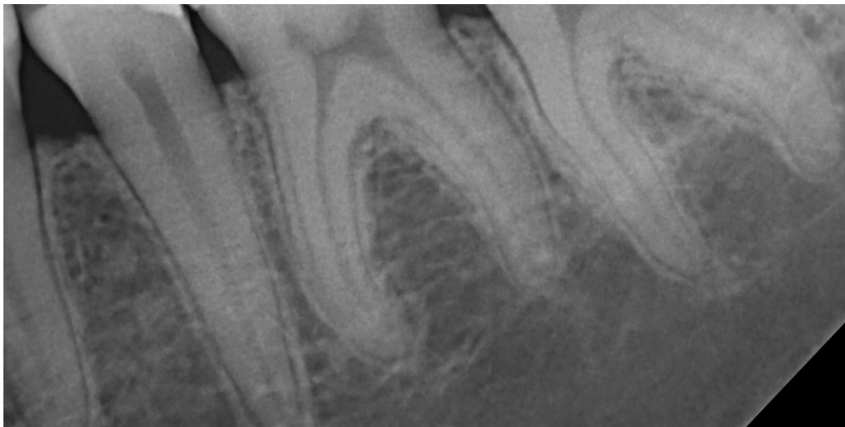
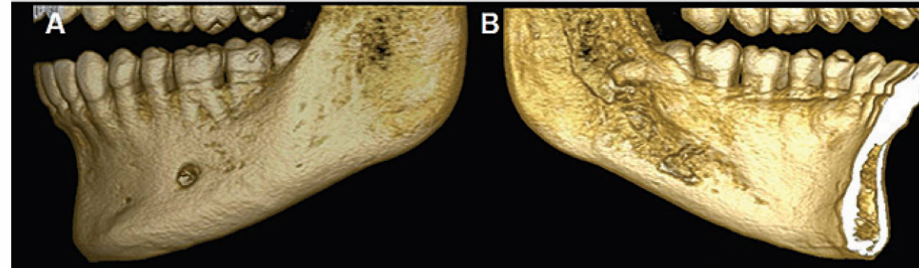


- Cortical and cancellous bone
- No *unusual* dark/light balloons
 - Mental foramen
 - Maxillary sinus
 - Nutrient channels
- Curve of Spee
- A typical dentition (32 teeth)

D1 Basic Science

Additional Anatomical Structures

- Teeth (enamel, dentin, pulp, CEJ)
- Alveoli
- Alveolar crest
 - Within 1.5mm of CEJ in health
- Lamina dura
- Periodontal ligaments



D2 Pathology

What pathological changes occur within the bone in patients with periapical osseous dysplasia?

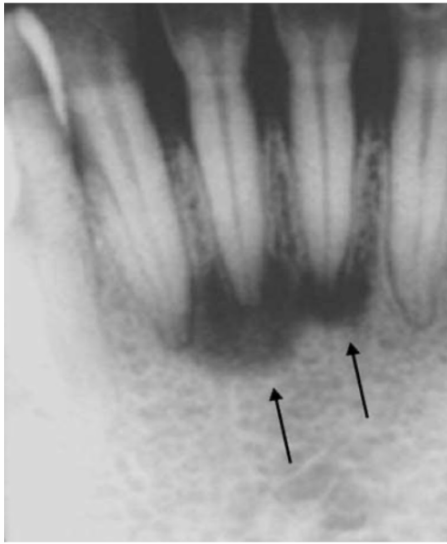
- Periapical Cemento-Osseous Dysplasia (PCOD)
 - Most common subtype of Cemento-Osseous Dysplasia (COD)
 - Benign fibro-osseous lesion
 - Periapical region of mandibular anterior teeth
 - Unknown etiology
 - Asymptomatic; teeth are vital
- Normal alveolar bone is replaced by fibrous connective tissue and varying amounts of mineralized tissue
- As the lesion matures, the tissue becomes more mineralized
- **3 stages**
 - Early/Fibrous /Radiolucent
 - Mixed
 - Mature/Calcified/Radiopaque

Noffke, CEE, Raubenheimer, EJ, & Peranovic V. (2019) Cemento-osseous dysplasia: a diagnostic challenge. *Journal of the South African Dental Association*. 74(4), 200-202. <http://dx.doi.org/10.17159/2519-0105/2019/v74no4a5>

Resnick, C. M., & Novelline, R. A. (2008). Cemento-osseous dysplasia, a radiological mimic of periapical dental abscess. *Emergency radiology*, 15(6), 367–374. <https://doi.org/10.1007/s10140-008-0758-6>

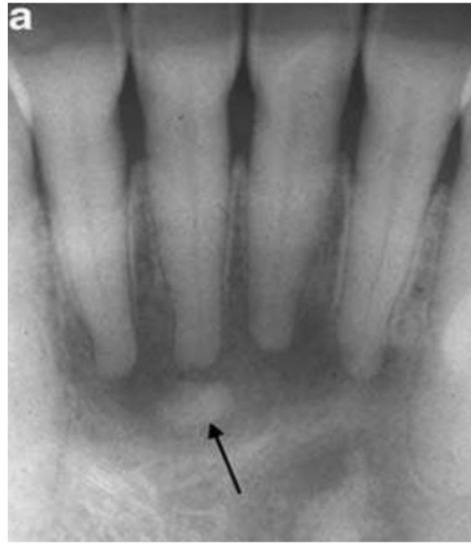
Senia, E. S., & Sarao, M. S. (2015). Periapical cemento-osseous dysplasia: a case report with twelve-year follow-up and review of literature. *International endodontic journal*, 48(11), 1086–1099. <https://doi.org/10.1111/iej.12417>

3 stages of PCOD



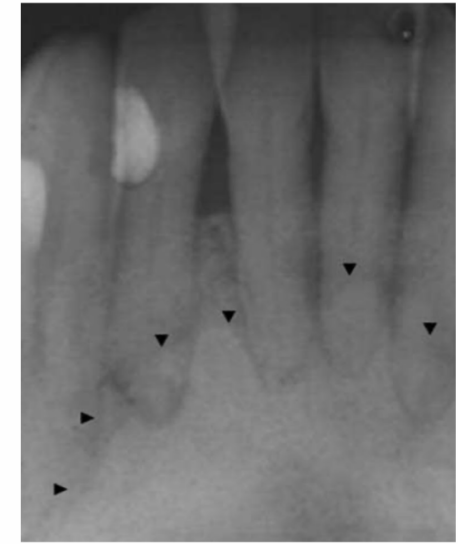
Early/Radiolucent Stage

Fibrous Tissue



Mixed Stage

Fibrous and Mineralized



Mature/Radiopaque Stage

Mineralized Tissue

D3 PICO

Clinical Question: What is the radiographic presentation of periapical osseous dysplasia?

PICO Format

P: Patients with periapical osseous dysplasia

I: Overtreatment

C: Periapical lesions treatments

O: Preventing overtreatment/unnecessary root canal treatment

PICO Formatted Question

- How does preventing overtreatment of patients presenting with periapical osseous dysplasia compare with follow-up treatments of other periapical lesions?

Clinical Bottom Line

- For patients with asymptomatic periapical lesions, it is important to review the patient's history and develop a differential diagnosis based off clinical and radiological examinations to determine the appropriate course of action and prevent overtreatment and unnecessary future complications. Periodic evaluations and close monitoring of the lesion using accurate diagnostic resources are needed to arrive at a definitive diagnosis for this patient.

Search Background

Date(s) of Search: Sept. 11th – Sept. 16th

Database(s) Used: PubMed

Search Strategy/Keywords:

- Endodontic lesions
- Management
- Periapical lesions
- Periapical Osseous Dysplasia

Search Background

MESH terms used:

- Periapical translucencies
- Differential diagnosis
- Cemento-osseous dysplasia
- Diagnostic errors
- Periapical disease
- Radiology

Article 1

- **Citation:** Daviet-Noual, V., Ejeil, A., Gossiome, C. *et al.* Differentiating early stage florid osseous dysplasia from periapical endodontic lesions: a radiological-based diagnostic algorithm. *BMC Oral Health* **17**, 161 (2017).
<https://doi.org/10.1186/s12903-017-0455-5>
- **Study Design:** Case Series
- **Study Need / Purpose:** To present a series of cases that describe the radiological features of florid osseous dysplasia and propose a diagnostic algorithm to help diagnose asymptomatic lesions and determine how to proceed in treating the patient

Article 1 Synopsis

Case 1: 64-year-old African male presented with a mobile and painful #14 resulting from periodontal abscess. A radiograph showed multiple periapical radiolucencies in the mandible. #14 was extracted.

Case 2: 50-year-old African male presented with chronic pain and tenderness on #18. A CBCT revealed a globally radiopaque lesion and an untreated ML canal. Endodontic retreatment was done.

Case 3: 72-year-old Cameroonian female present with multiple tooth pain. #15 was diagnosed with symptomatic apical periodontitis and immediately given endodontic treatment. CBCT revealed several atypical multilocular radiolucent lesions.

Article 1 Synopsis

Conclusions: Having a good understanding of the patient's past medical and dental history as well as recognizing radiologic features of different periapical lesions will help determine the correct course of action.

Limitations: No analytic data was gathered. Algorithm is based off author's interpretation of cases and own knowledge.

Article 1 Selection

- Relevance to PICO question and clinical bottom line
- Provides radiographic features of a different periapical lesion (FOD), supports the use of CBCT as a diagnostic resource, and emphasizes the importance of evaluating the circumstance of the lesion to determine the appropriate treatment

Article 2

- **Citation:** Senia ES, Sarao MS. Periapical cemento-osseous dysplasia: a case report with twelve-year follow-up and review of literature. *Int Endod J*. 2015;48(11):1086-1099. doi:10.1111/iej.12417
- **Study Design:** Case Report
- **Study Need / Purpose:** To follow a case of periapical osseous dysplasia over a long-term period and describe its radiological changes as it progresses through its three stages

Article 2 Synopsis

Case Summary:

- 26-year-old Caucasian female with POD on the apex of #26
- Asymptomatic radiolucent lesion, vital tooth
- No treatment necessary, monitored at 8 recalls over 12 years
- Osteolytic, cementoblastic, and mature stages of POD on #23-26 observed throughout all recalls
- At 12-year follow-up, almost normal appearance of bone seen at all sites except at #23

Article 2 Synopsis

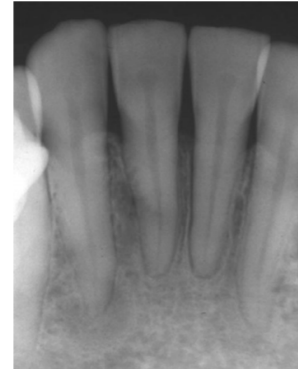
Case Summary



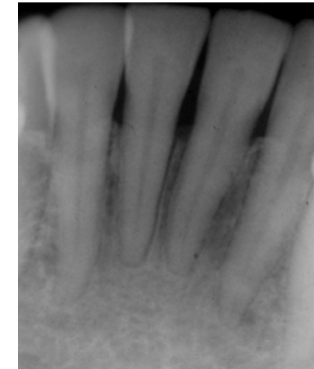
Initial visit



1 year 3-months



6 years



12 years

Conclusions: An accurate diagnosis depends on reviewing patient history, quality radiographs, knowledge of periapical lesions, and careful pulp testing. Long-term evaluation of POD lesions is recommended to confirm diagnosis.

Limitations: Follows only one case. Not all lesions were resolved. Time between recalls were not consistent

Article 2 Selection

- Relevance to PICO question and clinical bottom line
- Describes the same situation as our patient and suggests potential outcome of lesion over a long period of time
- Addresses management of periapical lesion through periodical monitoring with radiographs and clinical examinations

Article 3

- **Citation:** Torabinejad M, Rice DD, Maktabi O, Oyoyo U, Abramovitch K. Prevalence and Size of Periapical Radiolucencies Using Cone-beam Computed Tomography in Teeth without Apparent Intraoral Radiographic Lesions: A New Periapical Index with a Clinical Recommendation. *J Endod*. 2018;44(3):389-394. doi:10.1016/j.joen.2017.11.015
- **Study Design:** Individual Randomized Controlled Trial
- **Study Need / Purpose:** To determine the prevalence and size of periapical radiolucencies using CBCT imaging with conventional radiographic techniques in successfully endodontically treated teeth.

Article 3 Synopsis

Method: The prevalence and size of periapical radiolucencies in 120 endodontically treated roots from 53 patients with no signs of intraoral radiographic lesions were determined from CBCT images. The widest area of radiolucency in the periapical region was recorded and assigned a numeric score from 1-6 based on the PDL width.

Results: 53.3% of roots PDL width < 0.5 mm (1). 26.7% of roots PDL width between 0.5 -1 mm (2). Remaining 20% of roots PDL width > 1mm (3-6).

Article 3 Synopsis

Conclusions: CBCT imaging detected more apical radiolucencies versus standard imaging.

Limitations: Long-term follow-up of widened PDL space on teeth tested was not conducted. Unable to perform any histological analyses of radiolucencies.

Article 3 Selection

- Relevance to PICO question and recent publication
- CBCT is an effective diagnostic resource in evaluation of periapical lesions

Levels of Evidence

- ☐ **1a** – Clinical Practice Guideline, Meta-Analysis, Systematic Review of Randomized Control Trials (RCTs)
- ☒ **1b** – Individual RCT
- ☐ **2a** – Systematic Review of Cohort Studies
- ☐ **2b** – Individual Cohort Study
- ☐ **3** – Cross-sectional Studies, Ecologic Studies, “Outcomes” Research
- ☐ **4a** – Systematic Review of Case Control Studies
- ☐ **4b** – Individual Case Control Study
- ☒ **5** – Case Series, Case Reports
- ☐ **6** – Expert Opinion without explicit critical appraisal, Narrative Review
- ☐ **7** – Animal Research
- ☐ **8** – In Vitro Research

Strength of Recommendation Taxonomy (SORT)

<input type="checkbox"/>	A – Consistent, good quality patient oriented evidence
<input checked="" type="checkbox"/>	B – Inconsistent or limited quality patient oriented evidence
<input checked="" type="checkbox"/>	C – Consensus, disease oriented evidence, usual practice, expert opinion, or case series for studies of diagnosis, treatment, prevention, or screening

Conclusions

- In determining how to proceed with a patient that presents with an asymptomatic radiolucent lesion, it is important to gather any information concerning area of interest with radiographs, vitality tests, and patient history. This will allow for a more accurate diagnosis and help determine the appropriate treatment. CBCT can be a useful diagnostic resource for radiographic examination of a lesion in addition to using intraoral and panoramic radiography because it provides a 3D image giving better visualization and evaluation of the lesion. For patients with a proposed diagnosis of periapical osseous dysplasia and has healthy, vital teeth, it can be confirmed through periodic evaluations and follow-up radiographs.

Conclusions

- **Based on your D3's bottom line recommendations, how will you advise your patient?**

I will adequately inform the patient of our findings, our differential diagnosis and what we are recommending for treatment. I would advise that he let us know immediately if the suspected area becomes symptomatic in any way. Otherwise just maintain good oral hygiene.

- **How will you help your patient?**

I will perform periodic/clinical evaluations of the suspected area at every appointment. I can take a PA of the suspected area at the same time his bitewings are due (every 6 months). I will choose not to use a CBCT to evaluate the lesion due to financial challenges of the patient.

THANK YOU! Any Questions?

