

Critically Appraised Topic (CAT)

Project Team:
9A-4
Project Team Participants:
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Clinical Question:
What is the radiographic presentation of periapical osseous dysplasia?
PICO Format:
P:
Patients with periapical osseous dysplasia
I:
overtreatment
C:
Patients with periapical lesions
O:
Preventing overtreatment/unnecessary root canal treatment
PICO Formatted Question:
How do you prevent over-treatment of patients presenting with periapical lesions as compared to periapical osseous dysplasia?
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 in order 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.
Date(s) of Search:
Friday September 11 th – Wednesday September 16 th
Database(s) Used:
PubMed
Search Strategy/Keywords:
Endodontic lesions
Management
Periapical lesions
Periapical osseous dysplasia
MESH terms used:
Periapical translucencies

Differential diagnosis Cemento-osseous dysplasia Diagnostic errors Periapical diseases Radiology
Article(s) Cited: Daviet-Noual, V., Ejeil, A., Gossiome, C. <i>et al.</i> Differentiating early stage florid osseous dysplasia from periapical endodontic lesions: a radiological-based diagnostic algorithm. <i>BMC Oral Health</i> 17, 161 (2017). https://doi.org/10.1186/s12903-017-0455-5 Senia ES, Sarao MS. Periapical cemento-osseous dysplasia: a case report with twelve-year follow-up and review of literature. <i>Int Endod J</i>. 2015;48(11):1086-1099. doi:10.1111/iej.12417 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. <i>J Endod</i>. 2018;44(3):389-394. doi:10.1016/j.joen.2017.11.015
Study Design(s): 1) Case Series 2) Case Report 3) Individual Randomized Controlled Trial
Reason for Article Selection: 1) Relevance to PICO question 2) Relevance to PICO question and clinical bottom line 3) Relevance to PICO question, recent publication
Article(s) Synopsis: Article 1 Synopsis Three cases about patients presenting with FOD were reported to illustrate the radiologic stages of the pathology as well as display the difficulty in accurately diagnosing periapical FOD in previously endodontically-treated teeth due to its similar appearance to other lesions or determining its etiology. Based on the findings from these cases and the knowledge of the author, this study proposed a radiological-based diagnostic algorithm to aid in diagnosing periapical osseous dysplasia and in what situations endodontic treatment is indicated. Case 1 involved a 64-year-old African male with no significant contributing medical history who presented with a mobile and painful #14 resulting from a periodontal abscess. A panoramic radiograph showed multiple periapical radiolucencies especially

within the mandible, which was consistent with the diagnosis of FOD. #14 was deemed hopeless and extracted. No endodontic treatment was indicated due to no history of trauma and remaining teeth were vital.

Case 2 involved a 50-year-old African female with no significant contributing medical history who presented with chronic pain and tenderness on #18. A PA showed a previously endodontically treated tooth with a round mixed density periapical lesion located on the mesial root. Similar lesions were observed in the whole mandible on a panoramic radiograph. A small view CBCT was taken and was consistent with the diagnosis of FOD. It also revealed an untreated mesial-lingual canal; therefore, the tooth was managed by an endodontic retreatment.

Case 3 involved a 72-year-old Cameroonian female patient with a medical history of joint pain, gastric ulcer, and hypertension who presented with multiple tooth pain, most severe in the maxillary left area. With radiographic examination, #15 was diagnosed with symptomatic apical periodontitis and was immediately given endodontic treatment. A CBCT revealed several atypical multilocular radiolucent lesions in the left molar region. An incisional biopsy was conducted, and the results of the histopathological analysis was compatible with the diagnosis of giant florid osseous dysplasia.

These cases display the importance of having a good understanding of the patient's past medical and dental history as well as knowing how to manage a periapical radiolucent lesion based on the circumstance it is presented in and its radiological and clinical features.

Article 2 Synopsis

A case report was done on a 12-year follow up for a 26-year-old Caucasian female patient diagnosed with periapical (cement) osseous dysplasia (PCOD) to illustrate its long-term progression. Medical and dental histories were noncontributory and the observed radiolucency on the apex of #26 was deemed asymptomatic and the tooth was vital upon examination and testing. No immediate treatment was necessary and periodic follow-ups were recommended. Over a 12-year period, the patient was re-evaluated eight times. Palpation, percussion, hot, cold, and electric pulp tests and probing were all done on the mandibular anterior teeth at each recall. Findings were all within normal limits and pulps of all the teeth responded normally. Throughout the different recall appointments, the radiographic appearance of the anterior mandibular progressed through the three different stages of PCOD. Radiolucent lesions appeared at the apices of 23-25, which all progressed through the different stages of PCOD. By the eighth recall (12 years), the bone around all the teeth except for

#23 appeared normal. A small radiolucent area was observed at the distal surface of the root apex. After 12 years of follow-up from the first appointment, the appearance of the initially lesioned bone returned to almost its normal trabecular pattern. This article emphasizes the importance of reviewing patient history, the quality of radiographs, and performing accurate pulp testing to determine the correct diagnosis and appropriate treatment and avoid misdiagnosis and overtreatment. It is important to have follow-up appointments to monitor the progression of observed lesion. Knowing that PCOD progresses through stages, it is recommended for patients to have a long-term evaluation. The limits of this study include that it only followed the case of one patient and only evaluated the time frame in which the lesion around #26 was diagnosed to when it returned to its normal appearance.

Article 3 Synopsis

The purpose of this study was to determine the prevalence and size of periapical radiolucencies using CBCT imaging and conventional radiographic techniques imaging in endodontically treated teeth without signs of radiographic lesions to determine its success. The prevalence and size of periapical radiolucencies in 120 previously endodontically treated roots from 53 patients who have been determined to have no signs of intraoral radiographic lesions were determined by using CBCT. Inclusion criteria included initial RCT or nonsurgical retreatment, lack of mucoperiosteal swelling, no gingival probing depths greater than 4 mm, no sinus tract stoma, less than class 3 mobility, and no purulence and clinically asymptomatic teeth. Using the CBCT, and the widest area of radiolucency in the periapical region adjacent to the apex was recorded and then assigned to a numeric score according to the CBCT Endodontic Radiolucency Index (ERI) ranking developed for this purpose (score of 1-6 based on description of PDL width). Statistical tests were done to test whether the tooth or arch type was significantly associated with ERI distribution. From the results of this study, 53.3 % of roots had a CBCT-ERI score of 1 (<0.5 mm) and 26.7% of roots had a score of 2 (PDL width between 0.5 and 1mm). 20% of roots had an ERI in which periapical radiolucency was greater than 1mm, possibly indicating signs of pathological changes. No significant association was found between ERI score and tooth or arch type. Based on the results, it was concluded that CBCT imaging was able to detect more apical radiolucencies compared to standard imaging allowing for a more accurate evaluation of the periapical region especially in endodontically treated teeth. Further studies with long-term follow-up of the teeth from this study need to

be done to determine the appropriate treatment or course of action for these patients since no treatment was recommended following this study.

Levels of Evidence: (For Therapy/Prevention, Etiology/Harm)

See <http://www.cebm.net/index.aspx?o=1025>

- ☐ **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) For Guidelines and Systematic Reviews

See article **J Evid Base Dent Pract 2007;147-150**

- ☐ **A** – Consistent, good quality patient oriented evidence
- ☒ **B** – Inconsistent or limited quality patient oriented evidence
- ☐ **C** – Consensus, disease oriented evidence, usual practice, expert opinion, or case series for studies of diagnosis, treatment, prevention, or screening

Conclusion(s):

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.

