Jurnal Eduhealth
Volume 16, Number 04 2025 DOI 10.54209/eduhealth.v16i04
ESSN 2808-4608 (Online)
https://ejournal.seaninstitute.or.id/index.php/healt

Findings of Condesing Osteitis in Remaining Roots of Lower Molar Tooth on Periapical Radiograph

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Article Info
Keywords:
condensing osteitis,
periapical radiograph,
mandibular molar,
radices

ABSTRACT
Introduction: Condensing osteitis is one of the lesions that is often found during dental radiographic examination. This lesion is associated with reactive osteoblast hyperplasia caused by dental pulp infection. If this infection continues, it can affect the vitality status of the teeth and make the teeth brittle, leaving behind residual tooth roots. Aim: to report condensing osteitis in the remaining roots of the lower molar teeth found through periapical radiography. Case and Management: A 22-year-old female patient came to RSGM Soelastri complaining of residual lower jaw tooth roots that made her uncomfortable when eating. There was no history of systemic disease or allergy history found. Based on the radiographic examination, there was a radiopaque lesion at the apex of the root of tooth 36 accompanied by loss of lamina dura and widening of the periodontal ligament. This case was diagnosed as radices of tooth 36 accompanied by condensing osteitis. The treatments given were extraction and medication which showed good healing results without complications. Conclusion: Condensing osteitis cases really require radiographic examination for accurate diagnosis and treatment, especially in cases involving residual tooth roots. This underlines the importance of a comprehensive diagnostic approach in dental practice to prevent potential infections and ensure optimal treatment outcomes.

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INTRODUCTION

Condensing osteitis is a lesion frequently found during dental radiography. This lesion is associated with reactive osteoblast hyperplasia caused by damage or infection of the dental pulp. Clinically, this condition is asymptomatic and is usually only discovered through dental radiography. Radiographic examination plays a crucial role in establishing a diagnosis and developing an appropriate treatment plan.

Intraoral radiographs in dentistry are divided into several types and can be used as an additional examination. These include periapical, bitewing, and occlusal radiographs. Periapical radiographs are the most frequently used type of radiograph. This is because periapical radiographs can capture the teeth and surrounding tissues, specifically in the affected area.

Radiographically, condensing osteitis typically presents as a radiopaque, hard, sclerotic, and dense bone-like mass with well-defined borders located around the tooth apex.

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Furthermore, loss of the lamina dura and widening of the periodontal ligament space are also found in this lesion.

Teeth frequently associated with condensing osteitis include those with deep caries, large restorations, crowns or bridges, and teeth following root canal treatment. In cases of dental caries, biofilm activity, dietary factors, and the oral environment contribute to the demineralization process. If this process continues without prompt treatment, it can lead to infection of the tooth pulp and compromise its vitality.

A tooth whose vitality is compromised or even non-vital is characterized by pulp death due to chronic infection. This occurs because the pulp no longer has blood vessels and nerves that function normally. This condition is also known as pulp necrosis. If left untreated, extensive caries like this can lead to the complete loss of the tooth crown and the remaining tooth root, a condition known as root gangrene.

This condition of root gangrene requires immediate treatment. The treatment provided also depends on the condition of the root and surrounding tissue. If all components of the tooth and surrounding tissue are still in good condition, the tooth can be saved through root canal treatment. Conversely, if all components of the tooth and surrounding tissue are damaged or cannot be saved, the most appropriate treatment is to remove the remaining tooth root.

In teeth whose vitality is already compromised or even non-vital, there may be a history of chronic infection or previous dental inflammation. This inflammation is the cause of condensing osteitis. These lesions vary in size, ranging from 1 mm to 22 mm. These cases are mostly found in young patients with high tissue resistance, and the highest prevalence of caries occurs in the mandibular first and second molars. The purpose of writing this article is to discuss a case report regarding the finding of condensing osteitis in the remaining roots of mandibular molar teeth through periapical radiographs.

RESEARCH METHODS

The method used in this case report begins with a history taking regarding the patient's chief complaint, general medical history, and history of allergies and systemic diseases. An intraoral clinical examination was then performed to identify the condition of the remaining mandibular molar root and any accompanying symptoms, such as pain, discomfort during chewing, and the condition of the surrounding tissue. A periapical radiograph was then performed as a diagnostic support step to confirm the presence of a periapical lesion in the form of bony condensation around the apex of the involved tooth.

After the diagnosis of tooth root 36 with condensing osteitis was confirmed, treatment planning involved extraction of the remaining root. The procedure was carried out according to standard operating procedures, maintaining the principles of asepsis and antisepsis. The patient was then given medication therapy in the form of analgesics and antibiotics as clinically indicated. Follow-up visits included post-treatment checks to monitor wound healing and ensure the absence of complications.

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RESULTS AND DISCUSSION

Case And Management

A 22-year-old woman came toSoelastri Dental and Oral Hospital (RSGM) with a chief complaint of a remaining tooth root in the lower left jaw, which had been present for two years. The patient also stated that the remaining tooth root caused discomfort when eating. He previously reported having a tooth extraction about two months ago.

No history of systemic disease or drug, food, or weather allergies was found during the examination. Based on family history, the patient's parents did not have the same dental complaints as the patient. Furthermore, the patient's parents also had no history of systemic disease and no drug or food allergies. The patient was known to have a habit of brushing his teeth twice daily (in the morning after breakfast and at night before bed) and had a daily habit of drinking tea.

The extraoral examination revealed a symmetrical appearance to the patient's face. An intraoral examination revealed the presence of a residual root on tooth 36, with good oral hygiene (Figure 1). The patient was then advised to undergo a periapical radiograph to complete the series of tests performed and establish a proper diagnosis and treatment.

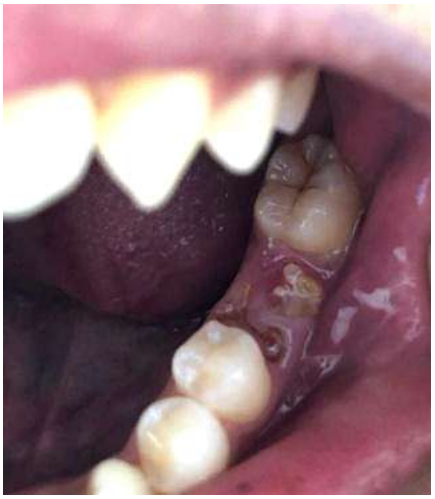

Figure 1. Intraoral Examination of the Patient

Based on the results of the periapical radiograph examination (Figure 2) it states that there is a radiopaque area with clear boundaries with loss of lamina dura and widening of the periodontal ligament at the apex of the mesial root of tooth 36 which describes this condition as condensing osteitis. Condensing osteitis is a local thickening or hardening of the alveolar bone around the apex of an infected tooth.

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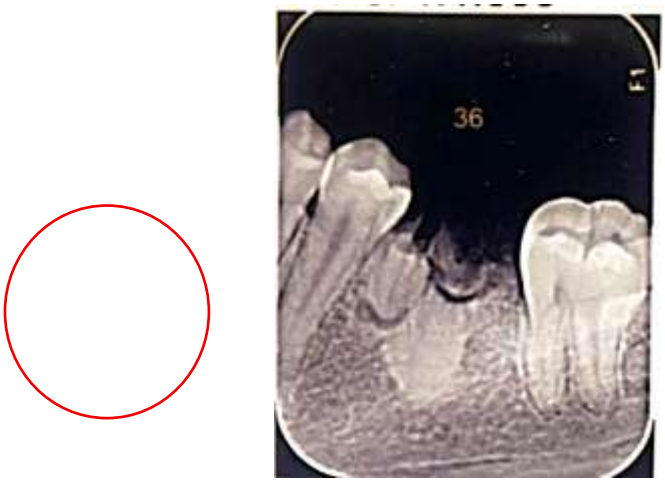

Figure 2. Periapical Radiograph of Patient

Based on these results, it can be concluded that the diagnosis of this case is a root fracture of tooth 36 accompanied by condensing osteitis. The treatment plan provided in this case report consists of Dental Health Education (DHE), extraction of the root fracture of tooth 36, medication, and follow-up. The entire treatment series was carried out with the patient's consent, with the patient signing an informed consent containing complete information regarding the diagnosis, treatment procedures provided, potential complications, and the course of treatment.

The treatment procedure (Figure 3) starts from; 1) preparation of the tools and materials to be used, followed by 2) examination of the patient's vital signs which show the results of the general condition: good, patient consciousness: compos mentis, blood pressure: 120/85 mmHg, temperature: afebrile, respiration L 18x per minute, and pulse: 85 x per minute. Next 3) asepsis is carried out in the operating area by applying povidone iodine solution using a cotton pellet. 4) in this case local anesthesia is carried out using pehacain solution and block injection techniques of the inferior alveolar nerve, the lingual nerve and the buccal nerve.

Figure 3. Tooth Extraction Process 36

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Next, 5) a separation procedure is performed using an excavator to separate the surrounding soft tissue from the tooth. 6) an elevation procedure is performed to separate and loosen the periodontal tissue such as the periodontal ligament from the tooth before extraction. 7) if the tooth has experienced luxation, then the extraction process is carried out using posterior root forceps. After the extraction process is successful, 8) the area of the extraction site is then cleaned of pathological tissue and granulation using a surgical curette. 9) after that, the extraction site is irrigated using povidone iodine and saline and then the patient is instructed to bite on a sterile tampon or gauze.

Patients were also given medication in the form of antibiotics, namely amoxicillin 500 mg taken (3x daily) for 7 days and analgesic or painkiller mefenamic acid 500 mg taken (3x daily) if pain. In addition, patients were also instructed to avoid hot food and drinks for 24 hours after the extraction, not to gargle too often, not to drink through a straw, not to play with the extraction area with the tongue, not to suck the extraction area, get enough rest, take medication regularly, and come back for a check-up 7 days after the extraction.

Seven days after the extraction, the patient returned for a follow-up visit, and stated that she had no complaints after the extraction. She also took her medication regularly and followed all instructions given. Intraoral examination (Figure 4) showed that the extraction socket had closed completely, was in good condition, and the mucosa was pink like the rest of the mucosa, without any signs of inflammation. Therefore, it can be concluded that the treatment in this case report was successful.

Figure 4. Intraoral Examination (7-day control after extraction)

Research Discussion

Condensing osteitis is a symptomless lesion detected through dental radiographs. It is described as a radiopaque, localized, and asymptomatic lesion. It occurs as a result of chronic pulp infection in teeth with deep caries.10 Dental caries results from an untreated demineralization process. If left untreated, this process can create cavities on the tooth surface that can expand and lead to pulp infection.

Pulp infection or pulp inflammation usually occurs in dental pulpitis. This sclerotic reaction is caused by the interaction of the patient's healthy immune system with the causative bacteria to reduce their virulence. 2 In later stages, the infection will cause a solitary

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thickening of the trabeculae located in the marrow space adjacent to the root apex of the affected tooth, with sclerotic changes in the apical bone.

Based on radiographic images, condensing osteitis is a bone compaction or solid radiopaque mass located around the apex of a non-vital tooth, but in some cases it can also be found in teeth that are still in the pulp degeneration phase (vital). The size and extent of this lesion can vary.11 This lesion also causes loss of lamina dura in the apical part of the associated tooth and widening of the periodontal ligament space.

In this case report, the patient complained of having a retained root on a lower tooth that often caused discomfort, especially when eating. This retained root can be caused by various factors, such as trauma or deep and extensive caries. 12 In this case, the patient's retained root was found to be associated with a previous deep and extensive caries condition, resulting in pulp infection and condensing osteitis.

The location of condensing osteitis in this case was found to be at the root apex of tooth 36. This finding supports previous findings by Gupta et al., who stated that condensing osteitis cases occurred mostly in mandibular first molars, followed by second molars. This is thought to be due to the prevalence of caries and fillings in mandibular molars, which are susceptible to pulpitis and pulp necrosis.

Treatment for these cases focuses on eliminating the underlying odontogenic infection, which can be accomplished by extraction or endodontic therapy of the associated tooth to remove the lesion. This is because, after appropriate treatment tailored to the tooth's condition, the lesion will resolve (healing, improvement, or complete disappearance) over time.

In this case, the remaining tooth root was extracted. The treatment results also showed a good level of healing without complications. This is known fromThe results of the intraoral examination when the patient was checked 7 days after extraction showed that the extraction socket had closed completely, the mucosa was pink, without any signs of inflammation.

This is in line with research conducted by Aljohani et al., 2024, which stated that in cases of condensing osteitis with residual root extraction treatment, there were no complications in all cases. The patient was also scheduled for a follow-up one week later and showed satisfactory healing.

CONCLUSION

Condensing osteitis is a condition that is difficult to detect through clinical examination alone. Supportive examination, such as a periapical radiograph, is essential for determining the correct diagnosis and treatment. In this patient, condensing osteitis was found in the remaining root of tooth 36, increasing the number of cases of condensing osteitis in mandibular molars. In this case, the treatment chosen was to remove the remaining tooth root. This was because the tooth could no longer be saved, and if left untreated, the remaining root could lead to further oral infections. The treatment results in this case showed a good rate of healing without any complications.

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